TAX REVENUE AND ECONOMIC DEVELOPMENT IN NIGERIA

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Abstract
This study examined the relationship between tax revenue and economic development in Nigeria from 1980 to 2024 using annual time series data. The study adopted an ex post facto research design and employed the Autoregressive Distributed Lag (ARDL) model and Error Correction Model (ECM) to analyze the short-run dynamics and long-run associations among Company Income Tax Revenue (CITR), Petroleum Profit Tax Revenue (PPTR), Value Added Tax Revenue (VATR), Customs and Excise Duties Revenue (CEDR), and the Human Development Index (HDI). The short-run ECM results showed that CITR (β = -0.1591, p = 0.0002) and PPTR (β = -0.0914, p = 0.0012) were negatively and significantly associated with HDI, while CEDR had a positive but insignificant contemporaneous association (β = 0.0519, p = 0.1738). However, the lagged value of CEDR showed a significant negative association with HDI (β = -0.1353, p = 0.0024). The error correction term (CointEq(-1) = -0.8483, p = 0.0000) confirmed the existence of a stable long-run equilibrium relationship. In the long run, CITR (β = -0.0040, p = 0.9083) and PPTR (β = -0.0459, p = 0.1136) were negatively but insignificantly associated with HDI, whereas VATR showed a significant negative association with HDI, indicating that increases in VAT revenue are associated with a decline in economic welfare outcomes. Conversely, CEDR exhibited a significant positive association with HDI, indicating that increases in customs and excise duties revenue are associated with improvements in development outcomes. The study recommends improved tax administration and efficient allocation of tax revenue toward developmental priorities to strengthen sustainable economic development in Nigeria. In conclusion, the study concludes that increases in VAT revenue are associated with a decline in economic development outcomes, while CEDR is associated with improvements in economic development across time horizons.

Keywords: Tax revenue, economic development, adjustment, error correction model, human development index.

1.0 Introduction

Taxation is widely recognized as a central instrument for fiscal sustainability and economic development, given its role in financing public goods such as healthcare, education, infrastructure, and security (Chiya et al., 2025; Ezenwobi& John-Akamelu, 2024). Beyond revenue mobilization, taxation is theoretically expected to support redistribution, correct market inefficiencies, and enhance social welfare through improved access to essential services. In principle, therefore, a well-structured tax system should translate fiscal capacity into measurable development outcomes.

However, despite this strong theoretical expectation, empirical findings on the taxation-evelopment nexus remain mixed and theoretically inconclusive, particularly in developing economies such as Nigeria. The lack of consensus stems largely from competing theoretical

lenses, including efficiency-oriented perspectives that emphasize growth effects and equity-oriented frameworks that prioritize redistribution and welfare outcomes. As a result, studies differ in their conclusions depending on whether they emphasize revenue productivity, distortionary effects, or institutional quality in fiscal transmission (Anyanwu et al., 2025; Ezenwobi& John-Akamelu, 2024). While some empirical evidence suggests that tax revenues enhance development through increased public expenditure on social services, others report weak, insignificant, or even adverse effects, often attributed to corruption, tax evasion, weak administrative capacity, and inefficient allocation of public resources.

This theoretical inconsistency is compounded by the use of aggregate tax measures that mask differences between direct and indirect taxes and their distinct development effects (Anyanwu et al., 2025; Ezenwobi& John-Akamelu, 2024). Many studies also assume a direct linear taxation development link without adequately incorporating institutional and macroeconomic mediators such as governance quality, fiscal discipline, and expenditure efficiency (Ezenwobi& John-Akamelu, 2024). As a result, the literature remains fragmented with limited consensus on the mechanisms through which tax revenue translates into development outcomes (Anyanwu et al., 2025), highlighting a theoretical gap on whether taxation consistently drives development or is conditional on institutional structures. These weaknesses have constrained government capacity to provide adequate public goods, leading to poor infrastructure, weak healthcare, unemployment, and rising poverty (Oghu et al., 2024; Mijinyawa et al., 2025). Taxation also serves as a fiscal tool for stabilizing the economy through its effects on aggregate demand, investment, inflation control, and resource allocation (Nyamdu et al., 2025).

Nigeria's tax structure includes petroleum profit tax (PPT), company income tax (CIT), value added tax (VAT), personal income tax (PIT), and customs and excise duties (CED), all expected to support development financing. Despite several reforms, empirical evidence on their effectiveness remains mixed. Sallau et al. (2023) reported that PPT and CIT positively influence economic growth, while VAT shows a negative effect. In contrast, Onukelobi-Emeka et al. (2026) found negative and insignificant effects of VAT and CIT, while CED exhibited mixed outcomes. Similarly, Ezenwobi and John-Akamelu (2024) observed positive but insignificant effects of VAT and CIT on HDI, while PPT had a significant negative effect, indicating persistent inconsistency in empirical findings.

Nigeria's tax-to-GDP ratio remains low at approximately 6%, compared to the African average of 17.2%, thereby limiting the country's fiscal capacity to finance infrastructural and social development (Anyanwu et al., 2025). This weak revenue performance reflects persistent structural and institutional challenges within the Nigerian tax system, including tax evasion, corruption, weak enforcement mechanisms, administrative inefficiencies, and poor accountability in the utilization of tax revenue (Oyedele, 2019, as cited in Ezenwobi& John-Akamelu, 2024). Beyond its descriptive significance, the low tax-to-GDP ratio provides an important analytical basis for this study, as it reflects the limited ability of tax revenue to translate into improved economic development outcomes despite increasing tax reforms and revenue mobilization efforts. Supporting this position,Onukelobi-Emeka et al. (2025) argued that Nigeria's persistently low tax revenue performance weakens government capacity to fund social infrastructure and human capital development despite tax reforms. Similarly, Ezenwobi and John-Akamelu (2024) observed that inefficiencies in tax administration and poor allocation of public resources weaken the developmental impact of tax revenue. Consequently, this study examines the association between Company Income Tax Revenue (CITR), Petroleum Profit Tax Revenue (PPTR), Value Added Tax Revenue (VATR),

Customs and Excise Duties Revenue (CEDR), and economic development, proxied by the Human Development Index (HDI), in Nigeria from 1980-2024.

2.0Literature Review

Economic development refers to the continuous improvement in the economic, social, political, and institutional well-being of a country and its citizens (Oladipo, 2026). It is broader than economic growth as it captures both quantitative and qualitative changes in an economy. Oghu et al. (2024) describe it as the long-term increase in net national product or per capita output, while Satope and Akanbi (2014) emphasize structural and institutional improvements in production systems. Belshaw and Livingstone (2002) associate it with improved living standards, education, and healthcare access, whereas Nedozi et al. (2014) highlight its role in reducing deprivation. Nyamdu et al. (2025) further note that it integrates economic, social, cultural, educational, and political transformation. Todaro and Smith (2006) distinguish it from economic growth by emphasizing broader structural and institutional changes. Consequently, it is commonly measured using GDP, HDI, and per capita income (Ibadin&Oluwatuji, 2021). This multidimensional nature explains contradictory tax–development findings, as results differ depending on whether GDP, HDI, or income measures are used. Thus, taxation may appear growth-enhancing under GDP-based studies but weak or negative under HDI-based assessments. Inconsistencies also arise when studies ignore how fiscal resources translate into health, education, and welfare outcomes, highlighting the need for more comprehensive analytical approaches.

However, this study adopts the Human Development Index (HDI) as the exclusive proxy for economic development because HDI provides a more comprehensive measure of welfare by incorporating income, education, and life expectancy dimensions, unlike GDP and per capita income which primarily capture economic output and income levels. This position is consistent with the view that HDI better reflects the multidimensional nature of development and human welfare in Nigeria (Omodero, 2019; Okolo, 2023). Empirical studies in Nigeria have also demonstrated that HDI is a more suitable indicator for assessing development outcomes because it captures improvements in health, education, and living standards simultaneously rather than focusing solely on economic growth indicators (Ovenseri-Ogbomo&Umoru, 2017; Omodero, 2019). The choice of HDI is therefore consistent with the study's objective of assessing the extent to which tax revenue translates into broader human and social development outcomes in Nigeria.

Tax Revenue

Tax revenue refers to compulsory income collected by government from individuals, firms, and economic activities to finance public expenditure and development (Sitharaman, 2022; Ashiedu et al., 2021). It includes direct and indirect taxes such as CIT, VAT, customs duties, and petroleum profit tax (Amahalu et al., 2022). In Nigeria, it is classified into oil and non-oil sources and serves as a key tool for redistribution, stabilization, and economic development (Olaoye et al., 2023).

Company Income Tax Revenue

Companies Income Tax Revenue (CITR) is a direct tax imposed on the profits of registered companies in Nigeria, including both resident and non-resident firms engaged in business activities. Resident companies are taxed on worldwide income, while non-resident companies are taxed only on Nigerian-sourced income (Ezeokafor, 2023). CIT is governed by the Companies Income Tax Act (CITA), as amended, and administered by the Federal Inland Revenue Service (FIRS). It is assessed on adjusted accounting profits, allowing only

allowable business expenses (Anyanwu et al., 2025). Tax rates vary by firm size, with large companies taxed at 30% (FIRS, 2025). Beyond revenue generation, CIT supports redistribution and economic stabilization (Olaoye et al., 2023), although its effectiveness is constrained by evasion and administrative inefficiencies (Dickson & Rolle, 2024).

Petroleum Profit Tax Revenue

Petroleum Profit Tax Revenue (PPTR) is a direct tax revenue imposed on income derived from upstream petroleum operations in Nigeria, including exploration, production, and sale of crude oil and gas. It covers rents, royalties, and profits from oil mining activities (Amusan&Ojo, 2025). PPT is a major source of government revenue and foreign exchange earnings (Afuberoh&Okoye, 2014). It is governed by the Petroleum Profit Tax Act (PPTA) and administered by the Federal Inland Revenue Service (FIRS), with annual assessments based on net profits from petroleum operations (Okeke et al., 2018). The tax is calculated using market or posted prices to ensure fair valuation (Horbett et al., 2018). Despite its importance, inefficiencies and weak institutional capacity limit its developmental impact in Nigeria (Onukelobi-Emeka et al., 2026).

Value Added Tax Revenue

Value Added Tax Revenue (VATR) is a consumption-based indirect tax revenue imposed on goods and services at each stage of production and distribution, with the final burden borne by the consumer (Joseph, 2018). It is levied on the value added to goods and services as they move through the production chain (Nnubia et al., 2020). VAT was introduced in Nigeria through the VAT Act of 1993 and became effective in 1994 to broaden the tax base and enhance revenue generation (Etoama et al., 2023). It applies to both locally produced and imported goods and is administered by the Federal Inland Revenue Service (FIRS) at a current rate of 7.5% (FIRS, 2025). Despite its importance, VAT administration in Nigeria is constrained by compliance and efficiency challenges (Fasoranti, 2013).

Customs and Excise Duties

Customs and Excise Duties (CED) are indirect taxes imposed on imported, exported, and locally manufactured goods to generate revenue and regulate trade. Customs duties apply to imports and exports, while excise duties are levied on locally produced goods (Amusan&Ojo, 2025). They are among the oldest forms of taxation and may be charged ad valorem or per unit (Fasoranti, 2013). In Nigeria, the Nigerian Customs Service (NCS) administers these taxes, ensuring revenue generation, trade facilitation, and protection of domestic industries (Onukelobi-Emeka et al., 2026). CED also helps curb smuggling and ensure compliance with trade regulations (Ezenwobi& John-Akamelu, 2024). Despite their revenue importance, excessive duties may increase production costs and hinder economic growth (Ebiringa&Emeh, 2012).

Theoretical Framework

This study is anchored on the Optimal Tax Theory, Benefit Theory, Ability-to-Pay Theory, and Laffer Curve Theory. The Optimal Tax Theory suggests that taxation should minimize economic distortions while maximizing social welfare (Slemrod, 1990; Mankiw et al., 2009). The Benefit Theory posits that taxpayers should contribute in proportion to the benefits received from public goods (Cooper, 1994), while the Ability-to-Pay Theory emphasizes equitable taxation based on income or capacity (Chigbu et al., 2012). The Laffer Curve Theory further explains that excessively high tax rates may reduce revenue by discouraging productivity and compliance (Laffer, 2004).

In relation to the specific tax components, Company Income Tax (CIT) and Petroleum Profit Tax (PPT) are mainly grounded in the Ability-to-Pay Theory and Optimal Tax Theory, as

they are levied on corporate profits and economic rents, with expected revenues directed toward financing education, healthcare, infrastructure, and other social services that improve Human Development Index (HDI). Customs and Excise Duties (CED) and Value Added Tax (VAT) are more closely explained by the Benefit Theory and Optimal Tax Theory, as they arise from consumption and trade activities and are expected to finance public goods and services that enhance living standards, education, and health outcomes reflected in HDI. Overall, the Laffer Curve Theory provides a cautionary perspective that excessively high tax burdens across CIT, PPT, CED, and VAT may discourage production, investment, and consumption, thereby weakening the revenue base required to sustain improvements in human development outcomes (Laffer, 2004).

Empirical Review and Hypothesis Development

Companies Income Tax Revenueand Economic Development

Empirical studies on the relationship between Companies Income Tax Revenue (CITR) and economic development in Nigeria show mixed and inconclusive results. Ezenwobi and John-Akamelu (2024) found a positive but statistically insignificant effect of CIT on HDI using RLS analysis, while Anyanwu et al. (2025) reported a negative and insignificant effect on HDI. Similarly, Onukelobi-Emeka et al. (2026) observed a marginally insignificant negative relationship with GDP. In contrast, Ewa et al. (2020) found a significant positive effect of CIT on GDP growth, suggesting that outcomes may depend on fiscal efficiency and economic conditions. These inconsistencies are partly explained by methodological limitations in prior studies, including reliance on static regression techniques, failure to account for dynamic adjustment processes, and the use of single-equation models that do not capture both short-run and long-run effects. In addition, many studies employ limited time horizons or fail to address non-stationarity in macroeconomic series, leading to potentially biased or spurious estimates.

Given these limitations, the present study adopts the Autoregressive Distributed Lag (ARDL) approach, which is more appropriate for time series data with mixed integration orders and allows for simultaneous estimation of short-run dynamics and long-run relationships. This specification also improves robustness by accounting for lagged effects and adjustment processes often ignored in previous studies. Consequently, the following hypothesis is formulated:

H_{01}: Company Income Tax Revenue (CITR) has no significant association with economic development in Nigeria.

Petroleum Profit Tax Revenue (PPTR) and Economic Development

Empirical evidence on Petroleum Profit Tax Revenue (PPTR) and economic development in Nigeria presents mixed outcomes. Ezeokafor (2023) found a significant positive effect of PPT on HDI, while Nyamdu et al. (2025) reported a positive but insignificant short-run effect and a significant long-run effect on GDP. Similarly, Etoama et al. (2023) observed that only lagged PPT values significantly influence development outcomes. In contrast, Ewa et al. (2020) reported little or no significant effect of PPT on GDP, attributing this to oil price volatility and policy constraints. These divergent findings reflect inconsistencies in methodology, economic conditions, and measurement approaches. Based on the above, the following hypothesis is raised:

H_{02}: Petroleum Profit Tax Revenue (PPTR) has no significant association with economic development in Nigeria.

Value Added Tax Revenue (VATR) and Economic Development

Empirical studies on Value Added Tax Revenue (VATR) and economic development in Nigeria show mixed results. Ezenwobi and John-Akamelu (2024) and Anyanwu et al. (2025) found a positive but insignificant effect of VAT on HDI, while Onukelobi-Emeka et al. (2026) reported a similar insignificant positive relationship with GDP. In contrast, Ewa et al. (2020) observed a significant positive effect of VAT on GDP growth, indicating its potential developmental role when efficiently managed. These inconsistencies suggest that VAT's impact depends on administrative efficiency and revenue utilization. Consequently, the study hypothesizes that:

H_{03}: Value Added Tax has no significant association with economic development in Nigeria.

Customs and Excise Duties (CED) and Economic Development

Empirical studies on Customs and Excise Duties (CED) and economic development in Nigeria show mixed and inconclusive findings. Ezeokafor (2023) found a significant negative effect of CED on HDI, while Etoama et al. (2023) reported selective and inconsistent effects on GDP per capita. Similarly, Osirim and Tunde (2019) found no significant relationship between CED and economic development using OLS and Granger causality techniques. Onukelobi-Emeka et al. (2026) also attributed weak developmental outcomes to administrative inefficiencies in customs revenue collection. In contrast, some evidence suggests that effective customs administration can support revenue generation and development when properly managed. These mixed results highlight the influence of institutional quality and enforcement capacity on outcomes. Based on these mixed findings, the study posits that:

H_{04}: Custom and Excise Duties has no significant association with economic development in Nigeria.

3.0Methodology

The study adopts an ex post facto research design and a time series approach covering 1980–2024 to examine the relationship between tax revenue and sustainable development in Nigeria. The design is appropriate because it relies on historical data without variable manipulation, making it suitable for analysing natural fiscal and macroeconomic relationships. The population consists of all annual observations within the period, implying a census approach. Data are sourced from NBS, CBN, FIRS, World Bank, and UNDP. Given structural changes such as SAP reforms, democratic transition, oil shocks, and VAT introduction, the ARDL framework is used due to its ability to handle dynamic adjustments, mixed integration orders, and structural shifts. Its ECM component captures both short-run deviations and long-run equilibrium adjustments. Overall, the design is justified by its policy-oriented nature and suitability for evidence-based analysis.

Model Specification

The econometric model for this study is adapted from Olaoye et al. (2023) and specified to examine the relationship between tax revenue components and economic development in Nigeria. Economic development, proxied by Human Development Index (HDI), is expressed as a function of Value Added Tax Revenue (VATR), Petroleum Profit Tax Revenue (PPTR), Company Income Tax Revenue (CITR), and Customs and Excise Duties (CED), while controlling for Economic Growth Rate (EGTH) and Inflation Rate (INFR):

$$HDI = f(VATR, PPTR, CITR, CED, EGTH, INFR) - - - - - - - - - - (I)$$

The explicit model is specified as:

$$HDIt = \beta 0 + \beta 1VATRt + \beta 2CEDt + \beta 3PPTRt + \beta 4CITRt + \beta 5EGTHt + \beta 6INFRt + \mu t - - - - - - (II)$$

For estimation purposes, the model is transformed into a log-linear form as:

$$lnHDIt = \beta 0 + \beta 1lnVATRt + \beta 2lnCEDt + \beta 3lnPPTRt + \beta 4lnCITRt + \beta 5EGTHt + \beta 6INFRt + \mu t - - - - - - (III)$$

Where HDI represents economic development, VATR, PPTR, CITR, and CED are tax revenue components, while EGTH and INFR are control variables. β_0 is the intercept, β1–β6 are coefficients, μt is the error term, and t denotes time (1980–2024). The a priori expectation is that $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$, while β_6 may be negative

ARDL Form:

$$HDI = C(1) * HDI(-1) + C(2) * CITR + C(3) * CITR(-1) + C(4) * PPTR + C(5) * PPTR(-1) + C(6) * VATR + C(7) * CEDR + C(8) * CEDR(-1) + C(9) * CEDR(-2) + C(10) * INFL + C(11) * EGTH + C(12) * EGTH(-1) + C(13) * EGTH(-2) - (IV)$$

Operationalization of Variables

Table1:

VariableMeasurementandSource

Variables	Definition	Variable	Measurement	Appriori Signs	Source
HDI	Economic Development	Dependent	CalculatedbyHuman Development Index	NIL	Olaoye et al. (2023)
VATR	Value Added Tax Revenue	Independent	Log of Value Added Tax Revenue.	+	Ezenwobi and John-Akamelu (2024)
CED	Custom and Excise Duties	Independent	Log of Custom and Excise Duties.	+	Etaoma et al. (2023)
PPTR	PetroleumprofitTax Revenue	Independent	Log of Petroleum profit tax revnue	+	Anyanwu et al. (2025)
CITR	CompanyIncomeTax Revenue	Independent	Log of Company Income Tax Revenue	+	Onukelobi-Emeka et al. (2026)
EGTH	Economic growth Rate	Control Variable	Measured as economic growth rate values	+	Chiya et al. (2025)
INFR	Inflation Rate	Control Variable	Measured as inflation rate values	_	Etaoma et al. (2023)

Source: Author's Compilation, 2026.

Justification for Measurement

The use of natural logarithmic transformation for tax revenue variables (CITR, PPTR, VATR, and CEDR) in this study is a deliberate and methodologically justified specification within a long-run time-series framework (1980–2024). Log transformation is widely adopted in macroeconomic analysis because it stabilises variance, reduces heteroscedasticity, and linearises exponential growth patterns commonly observed in fiscal variables. This enhances the robustness of the ARDL estimation and allows the estimated coefficients to be interpreted in elasticity form, consistent with established empirical practice in taxation and development studies.

Although deflation adjusts for price level changes, it does not fully eliminate broader macroeconomic distortions arising from structural breaks, exchange rate reforms, and fiscal regime shifts that characterise the Nigerian economy over the study period. To further

address inflation-related concerns, the inclusion of inflation rate (INFR) as a control variable explicitly captures price dynamics within the model, thereby reducing omitted variable bias. In addition, HDI is a real, non-monetary welfare indicator, which limits the likelihood of spurious inflation-driven relationships with nominal fiscal aggregates. Therefore, the use of logged nominal values is not a methodological limitation but a defensible specification choice that improves comparability, strengthens statistical properties of the data, and aligns with established econometric practice in long-span macroeconomic studies while maintaining control for inflation effects within the analytical framework.

4.0 Result and Discussion

Descriptive Statistics

Table 2:

Descriptive Statistics

	HDI	CITR	PPTR	VATR	CEDR	EGTH	INFL
Mean	0.4574	4.7417	5.3747	3.7882	4.9753	0.1371	0.1914
Median	0.4240	4.9499	5.8056	5.0358	5.2497	0.1201	0.1301
Maximum	0.7240	6.9236	6.6242	6.8275	6.7853	0.7447	0.7284
Minimum	0.3770	2.6053	3.5737	0.0000	3.2084	-0.1313	0.0539
Std. Dev.	0.0721	1.2706	1.0640	2.6421	1.0760	0.1522	0.1606
Skewness	1.2136	-0.1961	-0.4042	-0.6608	-0.2990	1.4922	1.8507
Kurtosis	5.0369	1.7924	1.5850	1.6278	1.7781	7.1212	5.4939
Jarque-Bera	18.8260	3.0224	4.9794	6.8052	3.4699	48.5446	37.3491
Probability	0.0001	0.2206	0.0829	0.0333	0.1764	0.0000	0.0000

Source: Author's Compilation, 2026.

The descriptive statistics provide an overview of the study variables for the period 1980–2024. HDI, used as a proxy for economic development, recorded a mean value of 0.4574, with minimum and maximum values of 0.3770 and 0.7240, respectively, indicating relatively low but improving human development over time. The standard deviation of 0.0721 suggests low variation in HDI values. Company Income Tax Revenue (CITR), Petroleum Profit Tax Revenue (PPTR), Value Added Tax Revenue (VATR), and Customs and Excise Duties Revenue (CEDR) had average values equivalent to approximately ₦114.63 billion, ₦215.88 billion, ₦44.18 billion, and ₦144.79 billion, respectively, reflecting significant contributions to government revenue. The control variables indicate average Economic Growth Rate and Inflation Rate values of 13.71% and 19.14%, respectively, while the Jarque–Bera statistics suggest mixed normality among the variables.

Unit Root Test

Table 3:

Unit Root Test

	Level		First difference		Order of Integration
Variable	**ADF - Choi Z-stat Test stat**	**P-value**	**ADF - Choi Z-stat Test stat**	**P-value**	
HDI	1.79791	1	-11.5946	0.0002	I(1)
CITR	1.79791	0.9599	-11.5946	0	I(1)
PPTR	1.79791	0.7959	-11.5946	0	I(1)
VATR	1.79791	0.7515	-11.5946	0	I(1)
CEDR	1.79791	0.9334	-11.5946	0	I(1)
EGTH	1.79791	0.0137	-11.5946	0	I(0)
INFL	1.79791	0.0289	-11.5946	0	I(0)

Source: Author's Compilation, 2026.

The ADF Choi Z-statistic results show mixed stationarity among variables. HDI, CITR, PPTR, VATR, and CEDR are non-stationary at level but become stationary after first differencing, indicating I(1). EGTH and INFL are stationary at level, indicating I(0). This mixed integration justifies the use of the ARDL model.

Lag Length Selection

Table 3:

Lag Length Selection Estimates

Lag	LogL	LR	FPE	AIC	SC	HQ
0	81.14087	NA*	0.001579	-3.61663	-3.324067*	-3.510093*
1	82.44489	2.099158	0.001558	-3.63146	-3.2971	-3.5097
2	83.58127	1.773867	0.001551	-3.638111	-3.26196	-3.50114
3	83.88097	0.453202	0.00161	-3.60395	-3.18601	-3.45176
4	84.03403	0.223987	0.001683*	-3.56264*	-3.1029	-3.39522

Source: Author's Compilation, 2026.

The lag length selection results show variation across information criteria. While the Schwarz Criterion (SC) selected lag 0 and the Hannan–Quinn Criterion (HQ) selected lag 1, both the Akaike Information Criterion (AIC) and Final Prediction Error (FPE) identified lag 4 as optimal. Hence, lag 4 was adopted for the analysis.

Bound Test Result

Table 4:

ARDL Bound Test Estimates

Null Hypothesis: No Long-Run Relationships Exist

Test Statistics	**Value**	**K**
F-statistics	5.235462	6
Critical Value Bounds		
Significance	I(0) Bound	I(1) Bound
10%	1.75	2.87
5%	2.04	3.24
2.50%	2.32	3.59
1%	2.66	4.05
Where k is the number of regressors		

Source: Author's Compilation, 2026.

The ARDL Bounds test results confirm a long-run relationship among the variables. The F-statistic (5.2355) exceeds the upper bound critical values at all significance levels, including 1%. Therefore, the null hypothesis of no cointegration is rejected, confirming a stable long-run relationship between tax revenue components and economic development.

Short-run relationship between Taxation Revenue and Economic Development

Table 5:

ARDL short-run relationship Estimation of variables

ARDL Error Correction Regression

Dependent Variable: D(HDI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CITR)	-0.1591	0.0379	-4.1977	0.0002
D(PPTR)	-0.0914	0.0254	-3.5921	0.0012
D(CEDR)	0.0519	0.0373	1.3931	0.1738
D(CEDR(-1))	-0.1353	0.0408	-3.3192	0.0024
D(EGTH)	0.0529	0.0358	1.4796	0.1494
D(EGTH(-1))	0.0781	0.0338	2.3106	0.0279
CointEq(-1)*	-0.8483	0.1279	-6.6316	0.0000
R-squared	0.5643	Adjusted R-squared	0.4916	
		Breusch-Godfrey Serial Correlation LM		
Durbin-Watson stat	2.4421	Test:	0.1096	
Heteroskedasticity Test: ARCH	0.9292	Jarque-Bera	192.1916	
Ramsey Reset Test	0.5199	Probability	0.0000	

Source: Author's Compilation, 2026.

The ARDL-ECM results show that CITR (β = -0.1591, p = 0.0002) and PPTR (β = -0.0914, p = 0.0012) have significant negative short-run relationships with HDI, while CEDR is positive but contemporaneously insignificant, with its lagged value showing a significant negative relationship (β = -0.1353, p = 0.0024). EGTH exhibits mixed effects, with the current value being positive but insignificant (β = 0.0529, p = 0.1494) and the lagged value showing a significant positive relationship (β = 0.0781, p = 0.0279). The error correction term is negative and statistically significant (β = -0.8483, p = 0.0000), confirming the existence of a stable long-run equilibrium relationship and indicating a relatively strong speed of adjustment of about 84.83% annually. Although this adjustment speed appears high in conventional macroeconomic contexts, it is not implausible in a tightly integrated fiscal system such as Nigeria's, where tax revenues and development outcomes are highly responsive to centralized fiscal policies, oil-driven budget dynamics, and relatively rapid transmission of government expenditure effects on social indicators.

The model explains about 49.16% of the variation in HDI, indicating moderate explanatory power. Diagnostic tests further confirm model reliability, as there is no evidence of serial correlation (Breusch Godfrey p = 0.1096) and no heteroskedasticity problem (ARCH test p = 0.9292), while the Durbin Watson statistic (2.4421) also supports the absence of autocorrelation. The Ramsey RESET test is insignificant (p = 0.5199), indicating no evidence of functional form misspecification. However, the Jarque Bera statistic (191.1916, p = 0.0000) indicates non-normality of residuals, which is common in long-span macroeconomic time series data and does not invalidate ARDL estimates due to their asymptotic robustness. Overall, the diagnostic results confirm that the model is statistically reliable and appropriate for inference on the tax HDI relationship in Nigeria.

Long-run relationship between Tax Revenue and Economic Development

Table 6:

ARDL long-run relationship Estimation of variables

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(HDI)				
Levels Equation				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CITR	-0.0040	0.0348	-0.1162	0.9083
PPTR	-0.0459	0.0282	-1.6298	0.1136
VATR	-0.0307	0.0072	-4.2745	0.0002
CEDR	0.1777	0.0503	3.5299	0.0014
EGTH	0.0526	0.0804	0.6537	0.5183
INFL	-0.0499	0.0546	-0.9141	0.3680
EC = HDI - (-0.0040*CITR -0.0459*PPTR -0.0307*VATR + 0.1777*CEDR + 0.0526*EGTH -0.0499*INFL)				

Source: Author's Compilation, 2026.

The ARDL long-run results show that CITR (β = -0.0040, p = 0.9083) and PPTR (β = -0.0459, p = 0.1136) have negative but statistically insignificant associations with HDI, indicating no meaningful long-run relationship and leading to acceptance of the null hypothesis. In contrast, VATR exhibits a significant negative association with HDI (β = -0.0307, p = 0.0002), suggesting that higher VAT revenue is associated with lower levels of development outcomes in the long run. Conversely, CEDR shows a significant positive association with HDI (β = 0.1777, p = 0.0014), indicating that increases in customs and excise duties revenue are associated with improved long-run development outcomes. Overall, only VATR and CEDR show statistically significant long-run associations with HDI, while CITR and PPTR remain insignificant.

Discussion of Findings

The ARDL results reveal clear differences between short-run dynamics and long-run associations among tax revenue components and economic development in Nigeria. In the short run, CITR and PPTR have significant negative associations with HDI, indicating that higher corporate and petroleum tax burdens are associated with lower economic welfare due to adjustment costs, reduced investment incentives, compliance pressures, and inefficiencies in fiscal transmission. From an institutional perspective, this reflects delays and frictions in Nigeria's fiscal system, where revenue collection does not immediately translate into welfare-enhancing expenditure due to budget implementation gaps, leakages, weak inter-agency coordination, and limited absorptive capacity in key social sectors. CEDR shows a mixed short-run pattern, with a positive but insignificant contemporaneous association and a significant negative lagged association, suggesting delayed adjustment and institutional weaknesses in customs administration, including border inefficiencies, enforcement gaps, and revenue volatility linked to import dependence.

In the long run, the pattern changes. CITR and PPTR remain negative but become statistically insignificant, implying no meaningful long-term association with HDI and reflecting weak fiscal transmission from these tax sources through institutional channels such as inefficient public investment allocation, oil-revenue dependence, and limited linkage between corporate taxation and social sector financing. VATR, however, shows a significant negative long-run association, suggesting regressive welfare implications of consumption-based taxation under conditions of inequality, inflation, and reduced purchasing power, compounded by administrative inefficiencies in VAT collection and weak redistribution mechanisms that limit its conversion into human development outcomes. In contrast, CEDR exhibits a

significant positive long-run association, indicating that trade-related taxes are associated with improved development outcomes through revenue mobilisation for infrastructure and public service financing when efficiently managed within relatively more structured customs enforcement systems.

A comparison across time horizons shows that CITR and PPTR are only negatively associated with HDI in the short run, with effects dissipating over time due to gradual fiscal adjustments and absorption of shocks through government budgeting processes. CEDR shifts from mixed short-run associations to strong long-run positive association, highlighting its structural importance in Nigeria's fiscal system, particularly through stronger institutional linkages to infrastructural financing and trade-related revenue channels. VATR emerges only in the long run as a negative determinant of development, reflecting persistent welfare costs associated with weak tax incidence management, inflation pass-through, and inefficiencies in redistributive fiscal policy. These patterns suggest that the transmission of tax revenue to HDI operates through institutional channels such as fiscal allocation efficiency, budget implementation effectiveness, tax administration capacity, sectoral dependence on oil revenues, compliance systems, and public expenditure quality.

Empirically, the findings align with studies such as Ezenwobi and John-Akamelu (2024) and Anyanwu et al. (2025) on CITR, and partially with Ewa et al. (2020) and Nyamdu et al. (2025) for PPTR. VATR results contrast with Ewa et al. (2020) but support evidence on the welfare burden of consumption taxation, while CEDR aligns with Etoama et al. (2023). Theoretically, the results partially support Optimal Tax Theory through CEDR, while VATR and short-run CITR/PPTR reflect inefficiencies. Benefit Theory is weakly supported, Ability-to-Pay Theory is partially contradicted, and Laffer Curve Theory is reflected in short-run distortions. Overall, only CEDR consistently enhances development outcomes, underscoring the need for stronger fiscal governance and institutional efficiency in Nigeria.

5.0 Conclusion and Reccommendation

This study examined the relationship between tax revenue components and economic development in Nigeria using an ex post facto research design and annual time series data spanning 1980–2024. The Autoregressive Distributed Lag (ARDL) approach, complemented by the Error Correction Model (ECM), was employed to capture both short-run dynamics and long-run equilibrium associations between Company Income Tax Revenue (CITR), Petroleum Profit Tax Revenue (PPTR), Value Added Tax Revenue (VATR), Customs and Excise Duties Revenue (CEDR), inflation, economic growth, and Human Development Index (HDI).

The short-run results reveal that CITR and PPTR exert significant negative associations with HDI, indicating that increases in these tax components are associated with reductions in economic welfare in the immediate period. This reflects short-run distortions arising from tax burdens, reduced investment incentives, and inefficiencies in fiscal transmission mechanisms. CEDR shows a mixed short-run association, with a positive but insignificant contemporaneous relationship and a significant negative lagged association, suggesting delayed adjustment and inefficiencies in customs revenue administration. The error correction term is negative and highly significant, confirming a stable long-run equilibrium relationship among the variables and indicating a rapid adjustment speed of about 84.83% toward equilibrium.

In the long run, CITR and PPTR have negative but statistically insignificant associations with HDI, implying no meaningful contribution to sustainable development. VATR shows a significant negative long-run association, suggesting regressive welfare implications

associated with consumption taxation under inequality and inflationary pressures. In contrast, CEDR exhibits a significant positive long-run association with HDI, indicating its developmental relevance through revenue generation, industrial support, and infrastructure financing when efficiently managed.

Overall, the study concludes that tax revenue impacts on economic development in Nigeria are mixed and highly dependent on tax type and administrative efficiency. While short-run associations are largely distortionary, long-run outcomes depend on institutional quality and fiscal effectiveness. Only VATR and CEDR exert significant long-run associations, while CITR and PPTR remain insignificant.

The study recommends improved tax administration, enhanced fiscal transparency, and more efficient allocation of tax revenues to ensure that taxation translates into sustainable economic development in Nigeria.

Recommendations

i. Given its significant negative short-run association and insignificant long-run association, corporate tax administration should be strengthened. The Federal Inland Revenue Service (FIRS) should enhance compliance monitoring, reduce evasion, and simplify tax procedures. CIT revenue should be transparently linked to visible development projects to improve public trust and developmental impact.

ii. Since PPTR shows short-run negative associations and no significant long-run association, Nigeria should reduce overdependence on oil-based taxation. Stronger transparency in petroleum revenue management is needed, alongside diversification of the revenue base. Petroleum tax proceeds should be strictly directed toward infrastructure and human capital development.

iii. Given its significant negative long-run association, VAT policy should be restructured to reduce its regressive burden. Essential goods and services should attract exemptions or differentiated rates to protect low-income households. Improved collection efficiency and reduced leakages should ensure that VAT gains translate into welfare improvements.

iv. With its significant positive long-run association, CEDR should be strengthened through digitalization and automation of customs processes. Anti-corruption measures at borders and improved trade facilitation policies should be prioritized by policymakers to sustain its positive developmental contribution.

v. Across all tax types, stronger fiscal transparency, accountability, and efficient public expenditure management are essential. Effective conversion of tax revenues into public goods will significantly enhance Nigeria's long-term economic development outcomes.

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