

Human Development Index in Nigeria: Does Tobacco Taxation Matter?

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Abstract: This study examined the effect of tobacco tax on the Human Development Index (HDI) of Nigeria. The study adopted an ex-post facto research design. Secondary data were collected from the National Bureau of Statistics (NBS), the Federal Inland Revenue Service (FIRS), and the Central Bank of Nigeria (CBN) Statistical Bulletin over a 25 year period that spanned 1999 and 2023. The inferential analyses were preliminarily done with Unit Root Test for stationarity, and Hansen Parameter Instability Cointegration Test for long-run stability. The null hypothesis was tested using Dynamic Ordinary Least Squares (DOLS) for estimation of effects. The finding revealed that tobacco tax has a positive and statistically significant effect on the Human Development Index in Nigeria ($\beta = 0.000079$; $p = 0.0000$). In conclusion, revenue from tobacco taxation not only generates fiscal resources but also contributes to measurable improvements in the quality of life reflected in education, health, and income dimensions of human development. The study recommends that the Federal Ministry of Finance should institutionalize periodic upward reviews of tobacco excise taxes and ring-fence a portion of the revenue for investments in education, healthcare, and income-support programs. This would ensure that the proven positive effect of taxation on HDI is not only sustained but also amplified through deliberate channeling of resources into the components that directly build human development.

Keywords— Tobacco Taxation, Tobacco Tax, Human Development Index, Nigeria

1. INTRODUCTION

In many developing countries, the relationship between health policies, fiscal measures, and development outcomes has become an increasingly important subject of research and policy debate. Nigeria, as the largest economy in Africa and the most populous country on the continent, presents a unique case where rapid population growth, urbanization, and lifestyle changes intersect with pressing developmental challenges (Adesola et al., 2024). Among these challenges is the growing burden of non-communicable diseases, many of which are linked to tobacco consumption (Attah & Attah, 2025). While tobacco has long been identified as a major public health concern, its effects extend beyond health alone, influencing economic productivity, household welfare, and national development. Nigeria faces persistent struggles with poverty, inequality, and limited access to quality healthcare and education, issues that directly affect human development outcomes (Nwoye et al., 2023). At the same time, the government continues to explore various avenues of revenue generation to meet the demands of development financing. Tobacco taxation, as a public health tool and revenue mechanism, occupies a strategic space in this context (Akanonu et al., 2018). Understanding how such taxation policies influence broader measures of well-being such as the Human Development Index (HDI) becomes crucial, as it provides evidence on whether fiscal and health policies can jointly improve living standards in Nigeria.

The Human Development Index, developed by the United Nations Development Programme, is widely recognized as a more holistic measure of development compared to traditional

economic indicators such as gross domestic product (Dahliah & Nur, 2021). It combines three key dimensions: life expectancy, educational attainment, and income levels, thereby offering a broad picture of human welfare and opportunities. For a country like Nigeria, where economic growth has often failed to translate into improved social outcomes, the HDI offers an important benchmark for assessing progress. On the other hand, tobacco taxation has gained renewed attention across the world as governments seek to discourage consumption, reduce health-related costs, and create additional fiscal space (Immurana et al., 2021a). In today's interconnected business and policy environment, multinational tobacco companies continue to exert influence on consumption patterns, while governments struggle to balance health objectives with economic considerations. For Nigeria, tobacco taxation sits at the intersection of public health regulation, international trade commitments, and domestic revenue mobilization (Akin-Onitolo & Hawkins, 2022). As such, linking tobacco taxation with HDI outcomes is not only relevant but also necessary for understanding how fiscal policy choices shape broader developmental trajectories in a business environment where global and local interests constantly interact.

The connection between tobacco taxation and the Human Development Index lies in the way taxation policies influence both health and economic conditions of individuals and societies. Higher taxes on tobacco typically lead to reduced consumption, which lowers the incidence of smoking-related illnesses and deaths (Mgammal, 2024). This directly contributes to improvements in life expectancy, a critical component of the HDI. Furthermore, reduced tobacco consumption lessens the financial burden on households,

freeing up resources that can be spent on education, nutrition, and healthcare, thereby improving other aspects of human development (Akanonu et al., 2018). At the same time, increased government revenue from tobacco taxation can be directed towards social sectors such as health infrastructure and educational programs, further supporting the drivers of HDI. However, these outcomes depend greatly on how well the taxation system is designed and whether revenues are efficiently utilized. In Nigeria, where governance challenges and policy inconsistencies often undermine reform efforts, the potential of tobacco taxation to significantly improve human development remains contested.

In every society, the pursuit of development goes beyond economic growth to include improvements in health, education, and overall quality of life (Pradhan et al., 2021). A well-functioning system of governance is one where policies are deliberately designed to safeguard public health while also creating opportunities for citizens to thrive. In this type of environment, Immurana et al. (2021) argued that fiscal tools such as taxation are used not only to generate revenue but also to influence behavior in ways that enhance social welfare. Tobacco taxation in such a setting would serve the dual purpose of discouraging harmful consumption while providing governments with additional funds to invest in education, healthcare, and social protection. By reducing the prevalence of smoking-related diseases and strengthening state capacity to deliver essential services, a society can experience tangible progress in measures of human development such as life expectancy, literacy, and income security (Attah & Attah, 2025). This relationship demonstrates how financial policy instruments can complement broader development goals when properly implemented.

Nigeria, however, has not fully achieved this form of alignment between taxation policy, public health, and human development outcomes. Although the government has adopted tobacco control measures, including excise duties, the consumption of tobacco products remains significant. Weak enforcement of regulations, limited awareness about the health risks of smoking, and the affordability of tobacco products undermine the effectiveness of these measures (Onoh et al., 2021). At the same time, revenues generated from tobacco taxation are often not ring-fenced for health or social development projects, reducing their potential developmental impact. The persistence of tobacco-related illnesses places additional strain on an already overburdened healthcare system, while household resources continue to be diverted toward managing preventable diseases. This situation points to a gap between the intention of taxation policies and the actual results experienced by individuals and communities.

The consequences of this mismatch are reflected in Nigeria's struggle to make substantial improvements in its Human Development Index. Sakthisankaran et al. (2024) observed that high tobacco consumption contributes to avoidable mortality and morbidity, lowering life expectancy and productivity. Families that allocate income to tobacco use or

to the treatment of smoking-related diseases are less able to invest in education and nutrition, perpetuating cycles of poverty and limited opportunity. On a national scale, the inability to channel tobacco tax revenues effectively into social services slows progress in health and education, which are critical pillars of human development. The result is a population that continues to face barriers to improved living standards despite the presence of policies that should, in principle, create positive change. Although several studies have examined tobacco taxation from economic, health, and policy perspectives, a clear link between tobacco taxes and the Human Development Index in Nigeria remains underexplored. For instance, Attah and Attah (2025) focused on tobacco control interventions in Nigeria, emphasizing prevalence reduction but not broader development outcomes. Sheikh et al. (2025) analyzed tax pass-through across sub-Saharan Africa, including Nigeria, but concentrated mainly on pricing strategies of tobacco firms. Mgammal (2024) provided cross-country evidence linking tobacco taxation to HDI, yet the findings were generalized and did not isolate Nigeria's unique socio-economic and policy context. Bella et al. (2024) and Prasada et al. (2024) concentrated on Indonesia, highlighting economic and consumption effects but not human development. Zatoński et al. (2023) and Akin-Onitolo and Hawkins (2022) examined the framing of tax debates in South Africa and Nigeria, respectively, without assessing measurable outcomes on human development. Similarly, Immurana et al. (2021a,b) studied taxation's impact on economic growth and smoking prevalence across African nations but did not link their findings directly to HDI. Akanonu et al. (2018) modeled revenue and consumption effects of tobacco tax reforms in Nigeria but left out human development indicators such as health, education, and income dimensions. Taken together, while these studies provide useful hints into taxation, pricing, consumption, and economic growth, there is still limited empirical evidence connecting tobacco taxation to HDI outcomes specifically in Nigeria, creating a research gap that this study seeks to address. Hence, this study examined the effect of tobacco tax on human development index of Nigeria.

2.0 LITERATURE REVIEW

2.1 CONCEPTUAL ISSUES

2.1.1 TOBACCO TAX

Tobacco tax is a type of excise duty imposed by governments on tobacco products such as cigarettes, cigars, and smokeless tobacco, primarily as a means of generating revenue and discouraging consumption (Mgammal, 2024). It is often referred to as a public health tax because of its role in reducing the affordability of tobacco and thereby lowering smoking prevalence. Bella et al. (2024) submitted that tobacco tax is a fiscal policy tool designed to address the negative externalities of tobacco use, such as healthcare costs, reduced productivity, and premature deaths. In another sense, it represents a targeted government levy on a product that carries social and health risks, ensuring that producers and consumers bear part of the broader costs associated with its consumption (Prasada et al., 2024). Tobacco tax, therefore, is

not just an ordinary source of government revenue but a deliberate intervention aimed at balancing economic and social objectives. Its meaning rests on two main foundations: fiscal necessity and public health protection (Akin-Onitolo & Hawkins, 2022). Governments impose it with the expectation that as the price of tobacco products rises, consumption will fall, especially among young people and low-income groups who are more sensitive to price changes (Immurana et al., 2021a). At the same time, the revenue collected offers governments a sustainable stream of funds that can be allocated to programs such as healthcare, education, and poverty alleviation. In this way, tobacco tax captures the idea of making tobacco less attractive to consume while converting its negative societal costs into resources for development (Mgammal, 2024). Its significance lies in the fact that it treats tobacco differently from ordinary commodities, acknowledging that the product brings measurable harm to individuals, families, and society at large. By doing so, it underlines the unique place of tobacco in fiscal policy and human development.

2.1.2 HUMAN DEVELOPMENT INDEX

The Human Development Index (HDI) is a composite statistical measure created by the United Nations Development Programme to provide a more comprehensive understanding of development than income alone (Dahliah & Nur, 2021). It can be defined as a tool that evaluates the overall well-being of people in terms of health, education, and living standards (Obianuju & Nworie, 2024). HDI is a summary measure that reflects the opportunities and capabilities available to individuals to live long, knowledgeable, and productive lives. HDI may also be understood as a yardstick that shifts attention from purely economic performance, such as gross domestic product, to the quality of human lives and the freedoms they enjoy. HDI is a comparative index that allows countries to be ranked according to human-centered development achievements rather than financial growth alone. Instead of focusing solely on material wealth, HDI places emphasis on people's capabilities and opportunities to lead meaningful lives. Its meaning is anchored in the recognition that economic prosperity does not automatically translate into better health or education, and that development should be measured by improvements in human welfare (Ikwuo et al., 2024). By combining indicators of life expectancy, educational attainment, and income, HDI seeks to capture a balanced picture of progress, though its definitions are ultimately about what development should represent: the expansion of human potential. The significance of HDI lies in the fact that it provides governments, scholars, and policymakers with a widely accepted framework to evaluate human progress (Dahliah & Nur, 2021). It reflects a deliberate shift away from narrow measures of success toward broader, people-centered dimensions.

2.2 SYNTHETIC REVIEW OF RELATED EMPIRICAL FINDINGS

The body of empirical evidence shows that tobacco taxation has considerable effects on consumption and public health outcomes, though its effectiveness varies across countries and contexts. Attah and Attah (2025) highlighted that tobacco control interventions in Nigeria, particularly tax-driven price increases, reduced demand, demonstrating the price sensitivity of consumers. Sheikh et al. (2025), however, revealed that tax pass-through strategies differed across twelve sub-Saharan African countries, including Nigeria, with overshifting, undershifting, and mixed responses affecting affordability and undermining the expected impact of taxation. Prasada et al. (2024) added that in Indonesia, while taxation reduced consumption in both rural and urban areas, rural households were more responsive, pointing to demographic differences in elasticity. Similarly, Immurana et al. (2021b) found across 24 African countries that higher prices and taxes significantly reduced smoking prevalence, with precise estimates showing the measurable influence of taxation on lowering demand. These studies collectively demonstrate that tobacco taxation generally reduces consumption but its outcomes are shaped by local market structures, consumer demographics, and industry behavior.

In addition to consumption, other studies reveal important developmental and economic implications of tobacco taxation. Mgammal (2024), in a global analysis of 163 countries, established a positive relationship between tobacco taxation and the Human Development Index, citing improvements in health outcomes, reduced consumption, and increased government revenue as mediating factors. Bella et al. (2024) reinforced this link in Indonesia, showing that tobacco tax increases stimulated economic output, household income, and job creation through expanded government spending. Immurana et al. (2021a), in another study, found that tobacco taxation supported both short- and long-run economic growth in 38 African nations, largely through improved public health. Akanonu et al. (2018) provided a Nigeria-specific perspective, showing that tax reforms reduced cigarette consumption and smoking prevalence while increasing government revenue, though the initially low tax burden limited the scale of impact. These findings point to a consistent trend: when revenues are effectively utilized, tobacco taxation can serve as a driver of broader economic and developmental gains.

However, the literature also shows that political and institutional dynamics strongly shape the outcomes of taxation policies. Zatoński et al. (2023), studying South Africa, found that debates around tobacco taxation were dominated by economic frames promoted by industry actors, undermining public support for stronger controls. Similarly, Akin-Onitolo and Hawkins (2022) observed that in Nigeria, tobacco firms, trade groups, and allied industries resisted excise tax increases through coordinated campaigns, while public health advocates lacked a unified front to push for sustained enforcement. This resistance highlights that even when empirical evidence supports taxation's health and developmental benefits, industry influence and weak

advocacy can dilute policy impact. Taken together, the ten studies show that tobacco taxation reduces consumption, raises revenue, and can enhance human development, but the extent of these benefits in Nigeria depends not only on economic conditions and consumer behavior but also on the strength of political will, enforcement capacity, and the prioritization of revenues for human development outcomes.

2.3 THEORETICAL FRAMEWORK AND DEVELOPMENT OF RESEARCH HYPOTHESIS

This study is anchored on Welfare Economics Theory which emerged in the early twentieth century as economists sought to evaluate not just how markets allocate resources but also how such allocation affects social well-being (Edenhofer et al., 2021). Its roots can be traced to the works of Arthur Cecil Pigou in his book *The Economics of Welfare* published in 1920. Pigou (2017) argued that individual market decisions often fail to account for the broader costs or benefits imposed on society, which he referred to as externalities. His contributions laid the foundation for understanding how government interventions, particularly through taxation and subsidies, could correct such inefficiencies. Later refinements by scholars such as Vilfredo Pareto and Abram Bergson provided additional frameworks for evaluating welfare improvements, making Welfare Economics a central body of thought in public finance and policy-making.

The main postulations of Welfare Economics Theory are that markets, left entirely on their own, do not always lead to socially optimal outcomes, especially when externalities exist (Pigou, 2017). When individuals consume goods that harm others, such as tobacco, private costs are lower than social costs, leading to overconsumption. The theory proposes that government intervention through fiscal instruments such as taxes can correct this imbalance by ensuring that consumers and producers bear the true social cost of their actions (Błaszczak, 2024). Welfare Economics further emphasizes that policies should aim to maximize overall social welfare rather than focusing narrowly on individual utility. Taxes on harmful goods, therefore, serve as corrective tools that align private decision-making with societal well-being.

This theory is highly relevant to the study of the effect of tobacco tax on the Human Development Index in Nigeria. Tobacco consumption generates significant health and economic costs, from increased healthcare spending to reduced productivity (Mwai et al., 2024), which negatively impact human development indicators such as life expectancy and income levels. By applying Welfare Economics Theory, tobacco taxation can be understood as a corrective policy aimed at reducing these negative externalities. The revenue generated can also be directed toward improving education and healthcare systems, further boosting Nigeria's HDI. In this way, the theory provides a strong justification for examining how tobacco taxation functions not just as a fiscal tool but as a mechanism for advancing broader developmental goals. Hence, we hypothesise that:

H₁: Tobacco taxation has a significant positive effect on the Human Development Index in Nigeria.

3.0 METHODOLOGY

This study adopted an ex-post facto research design. The choice of this design was informed by the fact that the data utilized were time series drawn from past economic events (Ikhuo et al., 2025). The use of secondary time series data was appropriate since the variables under investigation—tobacco tax and the Human Development Index (HDI)—span different years of Nigeria's economic and social development. The study empirically examined the effect of tobacco tax on human capital development in Nigeria, using HDI as a proxy for human development over the study period of 1999–2023.

The study relied exclusively on secondary data obtained from recognized institutional sources, including the National Bureau of Statistics (NBS), the Central Bank of Nigeria (CBN) Statistical Bulletin, and the Federal Inland Revenue Service (FIRS) annual reports. These sources provided reliable and consistent data on tobacco tax revenue and HDI values across the selected study period.

The study deliberately excludes the use of control variables because the central objective is to establish the direct effect of tobacco taxation on the Human Development Index (HDI) of Nigeria without diluting the focus of the analysis. Introducing additional control variables such as GDP growth, inflation, or government health expenditure could mask the independent role of tobacco tax, since these factors already indirectly influence HDI and may introduce multicollinearity problems. Moreover, HDI is itself a composite measure that integrates income, education, and health outcomes, which already embody the broader economic and social environment. By concentrating solely on tobacco taxation as the explanatory variable, the study ensures clarity in attribution, avoids confounding overlaps, and provides a more precise understanding of how fiscal measures on tobacco contribute to long-term human development outcomes.

The estimation model in this study considers tobacco tax revenue as the predictor variable and the Human Development Index (HDI) as the response variable. The functional form of the model is expressed as:

$$HDI_t = f(TBT_t) \quad \text{eqi}$$

Which can be represented in linear econometric form as:

$$HDI_t = \beta_0 + \beta_1 TBT_t + \mu_t \quad \text{eqii}$$

Where:

HDI_t = Human Development Index in year *t* (proxy for human capital development)

TBT_t = Tobacco Tax revenue in year *t*

β₀ = Constant term

β₁ = Coefficient of tobacco tax (marginal effect)

μ_t = Error term

The Human Development Index (HDI) was measured as a composite index of life expectancy, education, and income,

adapted from UNDP methodology and reported by the National Bureau of Statistics and UNDP Human Development Reports. Tobacco Tax (TBT) was captured as the total annual revenue from tobacco products in Naira, obtained from the Federal Inland Revenue Service and the Central Bank of Nigeria Statistical Bulletin.

The analytical procedure began with the use of descriptive statistics to summarize the properties of the variables, including mean, median, standard deviation, skewness, and kurtosis. To ensure the validity of the regression estimates, the time series properties of the variables were first examined using the Augmented Dickey-Fuller (ADF) unit root test. This was necessary to establish the order of integration and to avoid spurious regression results.

After establishing the stationarity status of the variables, the Hansen (1992) Parameter Instability Cointegration Test was applied to ascertain whether tobacco tax and HDI share a stable long-run cointegrating relationship. This test was preferred because it provides a robust check for the stability of the long-run relationship between variables in the presence of possible structural changes in the Nigerian economy during the study period.

Following evidence of cointegration, the study employed the Dynamic Ordinary Least Squares (DOLS) estimation technique to test the hypotheses and determine both the short-run and long-run effects of tobacco tax on HDI. DOLS was adopted because it corrects for small-sample bias, accounts for endogeneity, and provides efficient estimates in cointegrated systems by incorporating leads and lags of the differenced regressors.

4.0 DATA ANALYSIS

4.1 DESCRIPTIVE ANALYSIS AND MODEL DIAGNOSES

This study examined the effect of tobacco tax on the Human Development Index (HDI) of Nigeria. Secondary data were collected from the National Bureau of Statistics (NBS), the Federal Inland Revenue Service (FIRS), and the Central Bank of Nigeria (CBN) Statistical Bulletin over a 25 year period that spanned 1999 and 2023.

Table 1 Descriptive Analysis

	HDI	TBT
Mean	0.491480	720.9657
Median	0.480000	654.4482
Maximum	0.548000	2649.191
Minimum	0.430000	3.866201
Std. Dev.	0.035647	632.0236
Skewness	0.135469	1.106518
Kurtosis	1.707940	4.403135
Jarque-Bera	1.815445	7.152409
Probability	0.403442	0.027982
Sum	12.28700	18024.14
Sum Sq. Dev.	0.030496	9586893.
Observations	25	25

Source: Eviews 10 Output (2025)

In Table 1, the descriptive statistics for the Human Development Index (HDI) indicate that the mean value over

the 25-year period was 0.491, showing that Nigeria's human development has remained in the medium category as defined by UNDP thresholds. The maximum HDI within the study period was 0.548, while the minimum stood at 0.430, suggesting some gradual but limited progress in human development over time. The standard deviation of 0.0356 indicates that HDI values did not fluctuate widely, pointing to relative stability with slow upward changes. The skewness value of 0.135 suggests that the distribution of HDI is slightly right-skewed, meaning more years clustered toward lower values, although the skewness is very mild. Kurtosis of 1.707 indicates a flatter-than-normal distribution (platykurtic), implying that extreme HDI values were rare. Finally, the Jarque-Bera probability of 0.403 shows that HDI data are normally distributed, which strengthens its suitability for econometric analysis without the need for transformation.

For Tobacco Tax (TBT), Table 1 shows a mean value of 720.97 million naira, which reflects the average annual tax revenue generated from tobacco products during the study period. The maximum value of 2649.19 million naira highlights years of significantly higher tax collections, while the minimum of 3.87 million naira demonstrates how negligible tobacco tax revenue was at the beginning of the study period. The standard deviation of 632.02 million naira suggests considerable variability in tobacco tax revenue, which aligns with the gradual expansion of Nigeria's tax base and policy adjustments in excise duties. The skewness of 1.106 indicates a strong right-skewed distribution, showing that in most years tobacco tax revenues were relatively low, with only a few years recording very high figures. The kurtosis of 4.403 suggests a leptokurtic distribution, meaning there were pronounced peaks with heavy tails, driven by occasional sharp increases in tax revenues. The Jarque-Bera probability of 0.028, being less than 0.05, shows that TBT data are not normally distributed, implying the presence of outliers or sharp jumps in the data series, which reflects the irregular nature of tobacco taxation reforms and compliance in Nigeria.

Table 2: Unit root test result

Variables	T-ADF	Lag Length	P-value	Remark
HDI	-4.196733	I(0)	0.0152	Stationary
TBT	-4.731238	I(0)	0.0048	Stationary

Source: Eviews 10 Output (2025)

Table 2 presents the unit root test results, showing that both the Human Development Index (HDI) and Tobacco Tax (TBT) are stationary at level, that is, integrated of order zero I(0). For HDI, the Augmented Dickey-Fuller (ADF) test statistic is -4.1967 with a p-value of 0.0152, which is below the 5% significance threshold, confirming that the series does not contain a unit root. Similarly, TBT has an ADF statistic of -4.7312 with a p-value of 0.0048, also less than 0.05, meaning it is stationary at level. These results imply that both variables

are stable over time and revert to their mean without needing differencing, making them suitable for long-run estimation techniques such as cointegration analysis and Dynamic Least Squares (DOLS).

Table 3 Cointegration Test - Hansen Parameter Instability

Date: 09/01/25 Time: 00:56

Equation: UNTITLED

Series: HDI TBT

Null hypothesis: Series are cointegrated

Cointegrating equation deterministics: C

	Stochastic	Deterministic	Excluded	
Lc statistic	Trends (m)	Trends (k)	Trends (p2)	Prob.*
0.039884	1	0	0	> 0.2

*Hansen (1992b) Lc(m2=1, k=0) p-values, where m2=m-p2 is the number

of stochastic trends in the asymptotic distribution

Source: Eviews 10 Output (2025)

The result of the Hansen parameter instability cointegration test presented in the table shows that the null hypothesis of cointegration cannot be rejected. The reported Lc statistic is 0.039884 with a probability value greater than 0.20, which is far above the 5% level of significance. This implies that the estimated relationship between Human Development Index (HDI) and Total Bank Credit to the Private Sector (TBT) is stable and cointegrated in the long run. In other words, despite possible short-term fluctuations, the two series share a common long-term equilibrium path, and the parameters of the cointegrating equation do not exhibit instability over the sample period. This provides strong evidence that movements in HDI and TBT are tied together by a stable equilibrium relationship.

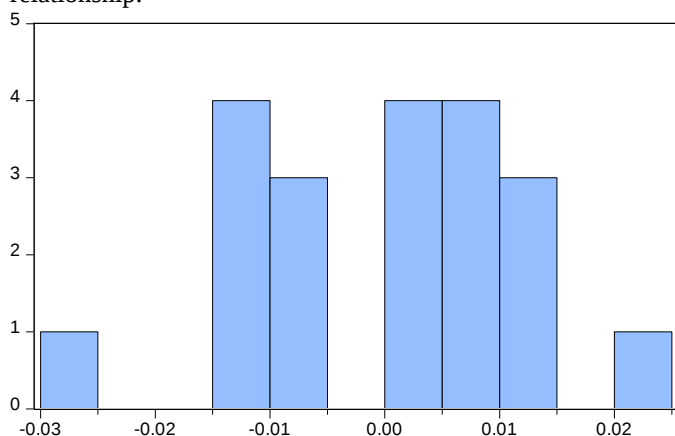


Figure 1 Normality Test

Source: Eviews 10 Output (2025)

Figure 1 shows the normality test result, where the Jarque-Bera statistic is 0.7722 with an associated p-value of 0.6797. Since the p-value is greater than the 5% significance level, the null hypothesis of normal distribution cannot be rejected. This indicates that the residuals are normally distributed, satisfying one of the key assumptions for reliable econometric

estimation. The normality of residuals further supports the validity of the results derived from the model.

4.2 TEST OF HYPOTHESIS

H₀: Tobacco taxation has no significant effect on the Human Development Index in Nigeria.

Table 4 Descriptive Analysis

Dependent Variable: HDI

Method: Dynamic Least Squares (DOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TBT	0.000079	0.000009	8.576999	0.0000
C	0.444761	0.007847	56.67828	0.0000
Mean dependent var				
R-squared	0.870929			0.500400
Adjusted R-squared	0.811358	S.D. dependent var		0.034106
S.E. of regression	0.014813	Sum squared resid		0.002853
Long-run variance	0.000249			

Source: Eviews 10 Output (2025)

Table 4 presents the Dynamic Least Squares (DOLS) estimation results for the effect of tobacco taxation (TBT) on the Human Development Index (HDI) in Nigeria. Before examining the coefficients, the validity of the model is first considered. The R-squared value is 0.8709, meaning that about 87.1% of the variation in HDI over the study period is explained by tobacco taxation. This high explanatory power indicates that the model fits the data well and that TBT is an important factor influencing HDI. Furthermore, the long-run variance estimate of 0.000249 is very small, suggesting that the residuals of the model are well-behaved, thereby lending

confidence to the stability and robustness of the estimation. Turning to the constant term, the coefficient of the intercept (C) is 0.4448 with a p-value of 0.0000, which is highly significant at the 5% level. This means that when tobacco taxation is absent or held at zero, the baseline value of HDI in Nigeria would be approximately 0.445. The statistical significance of this constant highlights the structural presence of various factors that sustain human development within the Nigerian context. It also suggests that HDI has a strong base independent of changes in TBT. The coefficient of TBT is 0.000079, with a p-value of 0.0000, which is statistically significant at the 5% level. Interpreting the marginal effect, this coefficient indicates that for every one-unit increase in tobacco tax revenue, HDI rises by approximately 0.000079 units. Although this marginal effect may appear small, its significance lies in the cumulative impact over time, considering the scale of national tax revenues and the long-run orientation of HDI. The significance of this effect shows that tobacco taxation is a powerful instrument for improving HDI, primarily through

the channels of increased government revenue, improved public health, and reduced tobacco-related diseases.

On the basis of the statistical evidence, the null hypothesis that tobacco taxation has no significant effect on HDI in Nigeria is rejected. The findings clearly support the alternative that tobacco taxation has a positive and statistically significant effect on HDI in Nigeria ($\beta = 0.000079$; $p = 0.0000$).

4.3 DISCUSSION OF FINDING

The study revealed that tobacco tax has a positive and statistically significant effect on the Human Development Index (HDI) in Nigeria ($\beta = 0.000079$; $p = 0.0000$). This finding suggests that increases in tobacco tax not only reduce the prevalence of smoking but also contribute to improvements in health, education, and income dimensions of development that make up the HDI. The mechanism behind this result can be attributed to two major pathways. First, higher taxes raise the retail prices of tobacco products, discouraging consumption due to their price elasticity, which in turn reduces tobacco-related illnesses and premature deaths. Second, the revenue generated from tobacco taxation provides government with additional fiscal resources that can be allocated to critical sectors such as healthcare and education, thereby fostering improvements in human capital development. This finding is consistent with several empirical studies. For example, Mgamal (2024) demonstrated across 163 countries that higher tobacco taxes improved HDI through enhanced revenue and reduced consumption, directly linking taxation to long-term development benefits. Similarly, Immurana et al. (2021a), in a study of 38 African countries, found that tobacco taxation stimulates economic growth by reducing health costs and freeing up resources for developmental activities, aligning with the Nigerian evidence. In another study, Akanonu et al. (2018), using Nigeria's context, confirmed that tobacco tax reforms consistently increased government revenue while lowering cigarette consumption and prevalence, projecting long-term improvements in public health and fiscal stability. Also, Prasada et al. (2024) established that higher tobacco taxes significantly reduced cigarette consumption in both urban and rural Indonesia, supporting the mechanism that lower smoking prevalence enhances national development outcomes. On the contrary, Sheikh et al. (2025) highlighted complexities in sub-Saharan Africa where tax increases were sometimes overshifted by firms to consumers, which could limit affordability gains or disproportionately burden poorer households, potentially weakening the equity of human development outcomes.

5.0 CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

The findings that tobacco tax exerts a positive and statistically significant effect on the Human Development Index in Nigeria hold broad meaning for both social and economic development. The result demonstrates that revenue from tobacco taxation not only generates fiscal resources but also contributes to measurable improvements in the quality of life reflected in education, health, and income dimensions of

human development. By showing that increases in tobacco taxation correlate with rising HDI, the evidence highlights the way fiscal measures in the form of excise duties can directly shape developmental progress beyond their immediate economic impact. This effect is particularly important in a country like Nigeria where the burden of tobacco-related illnesses places heavy costs on households and public health systems, thereby limiting productivity and social well-being. A statistically significant link indicates that the benefits extend beyond short-term revenue gains, as tobacco taxation seems to foster conditions that reduce preventable mortality and morbidity, which in turn support human capital formation. The fact that the coefficient remains positive confirms that taxation not only restrains harmful consumption but also helps redirect resources toward broader welfare gains. Such an outcome shows that fiscal tools like tobacco taxes can align with development goals by addressing both health risks and long-term socio-economic advancement. In this sense, tobacco taxation stands as more than a public health instrument, functioning instead as a lever through which government can influence living standards, income distribution, and longevity. This reinforces the idea that economic policies targeting specific consumption behaviors can ripple into wider developmental arenas, illustrating the interconnectedness of health finance and national well-being as measured through the Human Development Index.

5.2 RECOMMENDATIONS

The Federal Ministry of Finance should institutionalize periodic upward reviews of tobacco excise taxes and ring-fence a portion of the revenue for investments in education, healthcare, and income-support programs. This would ensure that the proven positive effect of taxation on HDI is not only sustained but also amplified through deliberate channeling of resources into the components that directly build human development.

5.3 CONTRIBUTION TO KNOWLEDGE

This study addresses a major gap in literature by linking tobacco taxation directly to human development in Nigeria, an area overlooked by earlier research that concentrated on consumption, revenue, or industry strategies. Attah and Attah (2025) studied interventions on smoking prevalence, while Sheikh et al. (2025) focused on tax pass-through in Africa, but neither connected taxation to development. Cross-country work by Mgamal (2024) showed taxation influences HDI, yet Nigeria's unique context was missing. Studies in Indonesia by Bella et al. (2024) and Prasada et al. (2024) examined economic and consumption outcomes, not broader welfare. Likewise, debates analyzed by Zatoński et al. (2023) and Akin-Onitolo and Hawkins (2022) overlooked measurable development impact. By focusing on HDI, this study shows how tobacco taxation strengthens overall quality of life.

5.4 LIMITATIONS OF THE STUDY AND SUGGESTION FOR FURTHER STUDIES

One limitation of this study is that it relied entirely on secondary data from official government sources, which may sometimes have gaps or issues with accuracy and consistency over such a long period. Also, because the study covered 25 years, it could not fully capture short-term shocks or other external factors like global economic crises, political changes, or health emergencies that might have influenced both tobacco tax revenues and human development outcomes in ways outside the control of the researcher.

For further studies, future researchers could expand on this work by using more recent or disaggregated data to capture state-level or regional variations in Nigeria, as human development outcomes often differ widely across locations. They could also combine quantitative analysis with qualitative approaches, such as interviews with policymakers and public health officials, to provide a deeper understanding of how tobacco tax revenues are allocated and how they directly affect education, health, and income improvements.

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