

Taxation and Health Outcomes in Nigeria

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Abstract- This study determined the effect of taxation on health outcomes in Nigeria. The study covered a period of thirty-four (1990 to 2023). The study proxy taxation by company income tax, value-added tax, education tax and personal income tax while health outcomes was measured by life expectancy. The study made use of time series data and the data were sourced mainly from Central Bank of Nigeria (CBN), Office of the Federal Inland Revenue Service and Annual Abstract of statistics of the National Bureau of Statistics. The major techniques of data analysis adopted include Augmented Dickey-Fuller (ADF) unit root test, correlation matrix of multicollinearity test, bounds cointegration test and Autoregressive Distributive Lag (ARDL) approach. The key findings of the study showed that company income tax has a positive and significant effect life expectancy in Nigeria. Also, value-added tax has a positive and non-significant effect on life expectancy in Nigeria. Contrarily, education tax has a negative and significant effect on life expectancy in Nigeria. Lastly, personal income tax has a positive and significant effect on life expectancy in Nigeria. Premised on the findings, the study concluded that taxation play a vital role in the improvement of health outcomes in Nigeria. The study recommended among others that the government should strengthen the efficiency and transparency of tax revenue utilization, particularly revenues generated from company income tax and personal income tax, which were found to have a positive and significant impact on life expectancy.

I. INTRODUCTION

The responsibilities shouldered by the government of any nation, particularly the developing nations (Nigeria inclusive), are enormous. The need to fulfil these responsibilities such as provision of infrastructural facilities, education, health, security services, social security services e.t.c largely depends on the amount of revenue generated by the government through various means. One of these means is taxation. Taxation is one of the oldest means by which the cost of providing essential services for the generality of persons living in a given geographical area is funded. Globally, governments

are saddled with the responsibility of providing some basic infrastructures for their citizens. Obligations the government may owe her citizens include but are not restricted to: stabilization of the economy, redistribution of income and provision of services in the form of public goods (Abiola & Asiweh, 2023). In other words, the economic and social development of any country depends to a large extent on the quantum of revenue generated for the provision of infrastructure in that given country; and one major means of generating the revenue for providing the needed infrastructure is through a well-structured tax-system (Ogbonna & Appah, 2022). On 26th June 2025, President Bola Ahmed Tinubu signed the four (4) Tax reform bills into law. These laws include The Nigeria Tax Act (NTA), The Nigeria Tax Administration Act (NTAA0, The Nigeria Revenue Service Act (NRSA) and the Joint Revenue Board Act (JRBA), collectively referred to as “the Acts”. The Acts all took effects from January 1st 2026 for their implementations. The Acts comprehensively overhauls the Nigerian tax system to drive economic growth and development, increase revenue generations, improve the business environment and enhance effective tax administration across the different levels of Government. This Act serves as Nigeria’s unified tax law, consolidating what used to be separate laws on companies income tax, personal income tax, capital gains tax, petroleum profits tax, value added tax, stamp duties, and more. It explicitly repeals the prior tax acts and related laws (e.g. Capital Gains Tax Act, Companies Income Tax Act, Personal Income Tax Act, VAT Act, Stamp Duties Act, etc.) and amendments to various incentive laws. The Nigeria Tax Act covers: Taxation of incomes (for companies and individuals, residents and non-residents), ascertainment of profits and gains, tax rates, capital gains taxation, special industries (petroleum, mining, lotteries, free zones, etc.), Value Added Tax, Stamp Duties, and various tax incentives and exemptions (embedded in schedules). The

ssobjective is to create a single coherent tax code that governs all forms of taxation on income, transactions, and instruments. The scope is broad – it applies countrywide and to all persons who have tax obligations in Nigeria. Taxable persons are defined to include individuals, companies (Nigerian and foreign), partnerships, trusts, and other entities. Notably, the Act introduces new concepts such as “Nigerian company” (incorporated or controlled in Nigeria) whose global profits are taxable, Controlled Foreign Company (CFC) rules taxing profits of foreign subsidiaries of Nigerian companies, and Significant Economic Presence (SEP) for taxing digital economy transactions by non-residents. It also aligns with international trends by incorporating a minimum global tax rule (15% effective tax rate floor for large companies), and broadens the tax base to include digital assets and virtual transactions (treated as taxable property or income). Types of taxes covered in this Act and their basic rates include: corporate income tax (30% standard rate, 0% for small companies), personal income tax (graduated rates up to a top rate specified in a schedule – with minimum wage earners exempt), capital gains tax (now integrated such that chargeable gains are taxed as part of income profits, effectively at applicable income tax rates), VAT (7.5% on taxable supplies), and stamp duties (various rates on instruments, with detailed schedules). The Act also imposes a new Development Levy of 4% on company profits (for resident companies) to fund education, technology, and security agencies. In summary, the Nigeria Tax Act, 2025 creates a unified tax framework aimed at simplifying compliance and ensuring all income (including from foreign or digital sources) is appropriately taxed.

Gbato (2017) stated that taxation is the most important source of revenue to the government; owing to the inherent power of the government to impose taxes, the government is assured at all times of its tax revenue no matter the circumstances. The structure of Nigerian tax administration is in line with the system of government in operation. The revenue from taxation has a significant positive effect on health outcomes, particularly through its role in financing public health systems and expanding access to essential healthcare services. In many developing countries, including Nigeria, tax revenue constitutes a

major source of government funding for health infrastructure, medical personnel, and preventive care programmes. Increased tax revenue enables governments to invest in hospitals, primary healthcare centres, immunization campaigns, and disease control initiatives, which collectively improve population health indicators such as life expectancy and reduce infant and maternal mortality rates. According to World Health Organization (2025), countries that mobilize higher domestic revenue through taxation are better positioned to achieve universal health coverage and strengthen their healthcare systems. Similarly, studies by Gupta, Clements, and Tionson (2002) show that higher public spending financed by tax revenue significantly improves health outcomes in developing economies by enhancing service delivery and access to care. Furthermore, tax revenue can improve health outcomes indirectly by promoting equity and reducing socioeconomic disparities, which are key determinants of health. Progressive tax systems allow governments to redistribute income and fund social protection programmes, including health insurance schemes and subsidies for vulnerable populations. This reduces out-of-pocket healthcare costs and increases utilization of medical services, particularly among low-income groups.

However, despite increases in tax revenue in Nigeria over the past decades, health outcomes, particularly life expectancy at birth, have remained relatively low compared to global and regional benchmarks, raising concerns about the effectiveness of public revenue utilization in the health sector. Although tax revenue is expected to enhance government capacity to fund healthcare infrastructure, improve service delivery, and expand access to essential medical services, evidence suggests that these potential benefits have not been fully realized in Nigeria due to issues such as inefficient allocation, corruption, weak institutions, and inadequate prioritization of health expenditure. Data from the World Bank and the World Health Organization indicate that Nigeria’s life expectancy has remained relatively low, hovering around the mid-50s to early 60s years, despite fluctuations and occasional increases in government revenue. This paradox suggests a possible disconnect between revenue generation and effective health outcomes, thereby creating a gap in empirical

understanding of how tax revenue translates into improvements in life expectancy. Furthermore, existing studies often focus broadly on public expenditure without isolating the specific role of tax revenue or examining its direct and indirect channels of impact on health indicators. Consequently, there is a compelling need for a focused empirical investigation into the effect of taxation on health outcomes in Nigeria. It is against this backdrop that this study examined the effect of taxation on health outcomes in Nigeria. Specifically, the study sought to:

- i. determine the effect of company income tax on life expectancy in Nigeria.
- ii. analyse the effect of value-added tax life expectancy in Nigeria;
- iii. evaluate the effect of education tax on life expectancy in Nigeria; and
- iv. ascertain the effect of personal income tax on life expectancy in Nigeria.

II. LITERATURE REVIEW

Theoretical Literature Review

The following theories are reviewed in order to provide theoretical foundation to this study:

a. Ability to Pay Theory

The Ability to Pay Theory of taxation is traditionally attributed to classical economists, particularly Adam Smith (1776) in *The Wealth of Nations*, and was later refined by scholars such as John Stuart Mill (1848) and A.C. Pigou (1920). Smith introduced the principle of equity in taxation, arguing that citizens should contribute to government revenue in proportion to their ability, typically measured by income or wealth. Mill expanded this idea by emphasizing fairness and the need to minimize sacrifice, while Pigou incorporated welfare economics, stressing that taxation should be structured to promote social welfare. The theory posits that taxes should be levied based on an individual's capacity to bear the burden, rather than the benefits received from public services. In essence, it supports progressive taxation, where higher-income earners pay a larger share of their income in taxes, thereby promoting equity and redistribution in society (Smith, 1776; Mill, 1848; Pigou, 1920). The

core assumptions of the Ability to Pay Theory include the idea that taxpayers differ in their financial capacity, and that taxation should be distributed equitably based on income, wealth, or economic strength. It assumes that individuals with higher incomes can bear a greater tax burden without significantly reducing their welfare, while lower-income individuals should be taxed less to avoid hardship. Another assumption is that taxation should aim to minimize inequality by redistributing income from the rich to the poor. The theory also presumes that government will utilize tax revenue efficiently to provide public goods and services that improve societal welfare. Furthermore, it assumes that progressive taxation enhances social justice and economic stability by reducing income disparities and supporting vulnerable populations through public expenditure.

In the Nigerian context, the Ability to Pay Theory provides a useful framework for explaining how tax revenue can influence health outcomes such as life expectancy at birth. By ensuring that individuals and corporations contribute taxes according to their financial capacity, the government can mobilize sufficient revenue to invest in healthcare infrastructure, public health programmes, and social services. When tax revenue is equitably generated and effectively allocated, it can fund critical interventions such as immunization, maternal healthcare, and disease prevention, which directly improve life expectancy. Moreover, progressive taxation helps reduce income inequality, enabling poorer households to access healthcare services either through subsidies or publicly funded systems. Thus, the theory explains that a fair and efficient tax system in Nigeria can enhance government revenue, improve healthcare delivery, and ultimately lead to better health outcomes, including increased life expectancy at birth.

Benefits Theory of Taxation

The Benefits Theory of Taxation is commonly associated with early public finance scholars such as Knut Wicksell (1896) and Erik Lindahl (1919), who provided its formal analytical foundation. Wicksell introduced the idea that taxation should be linked to the benefits individuals receive from public expenditure, arguing that citizens should pay taxes in

proportion to the public services they consume. Lindahl later refined this concept through the Lindahl equilibrium model, which suggests that individuals reveal their willingness to pay for public goods, and taxation is structured accordingly to achieve efficient resource allocation. The central idea of the theory is that there should be a direct correspondence between taxes paid and benefits received, making taxation similar to a market exchange for public goods and services (Wicksell, 1896; Lindahl, 1919). The theory rests on several key assumptions. First, it assumes that individuals can accurately assess the value of public goods and express their willingness to pay for them. Second, it presumes that the government can measure and allocate the cost of public goods in proportion to the benefits received by each taxpayer. Third, it assumes a fair and transparent system where taxpayers perceive a direct link between taxes paid and services enjoyed. Additionally, the theory assumes that public goods can be efficiently provided when individuals contribute based on perceived benefits, leading to optimal allocation of resources. However, in practice, these assumptions are difficult to fully achieve due to the non-excludable and non-rival nature of many public goods, such as healthcare. In the Nigerian context, the Benefits Theory of Taxation helps explain the relationship between tax revenue and health outcomes, particularly life expectancy at birth. When taxpayers perceive that their contributions are effectively translated into improved healthcare services—such as better hospitals, access to medicines, and public health programmes—they are more likely to support tax compliance, thereby increasing government revenue. This revenue can then be invested in the health sector to improve service delivery, reduce mortality rates, and enhance life expectancy. However, if there is a weak link between taxes paid and benefits received, such as poor healthcare infrastructure or inefficient service delivery, the effectiveness of tax revenue in improving health outcomes may be limited. Thus, the theory suggests that for tax revenue to positively impact life expectancy in Nigeria, the government must ensure transparency, accountability, and efficient allocation of resources toward healthcare services.

Empirical Literature Review

Ndah, Ekwueme, Amahalu and Ndubuisi (2024) examined the effect of taxes on net investment of industrial goods firms in Nigeria. Research adopted the ex-post facto research design to study a population of thirteen (13) listed industrial goods firms over a period of 11 years (2013-2023). Data obtained were analysed using the panel regression. The results showed that company income tax and tertiary education tax had insignificant effect on net investment, though positively negatively related respectively. The study further found that value added tax and capital gains tax were negatively significant, while industrial training tax was positively significant.

Olaoye, Yunus and Opefolu (2023) examined tax revenue and economic development in Nigeria. The sample technique used in this study is a Judgmental sampling technique. The study evaluated the effect of tax revenue on the economic development in Nigeria from 2003-2020. The data was obtained from the publication of Federal Inland Revenue service, Central Bank of Nigeria, Annual Statistical Bulletins, and the National Bureau of Statistical. The reliability of the data was premised on published reports and bulletins from CBN. Data was analysis using descriptive and inferential statistics. The findings of this study shows that petroleum profit, company income tax, value added tax, and education tax has a significant relationship / effect on economic development, because the p-value for petroleum profit, company income tax, value added tax and education tax is less than the level of significance.

Eneisik, Obara and Uwikor (2023) empirically ascertains the effect of companies income tax on financial performance of quoted manufacturing companies in Nigeria. The population of the study consists of sixty quoted manufacturing companies in Nigeria. The study adopts purposive sampling techniques to select thirty quoted manufacturing companies as a sample size. Secondary data was obtained from audited annual financial reports of quoted manufacturing companies in Nigeria from 2006-2020. Hypotheses formulated were tested using panel least squares regression through pooled effect, fixed effect, and random effect, determined by the Hausman test, fixed effect regression was preferred

for results interpretation with the aid of EViews 10 econometric statistical software. Findings show that company income tax had a negative and insignificant effect on net profit margin of quoted manufacturing companies in Nigeria. Capital gains tax had positive and significant effect on net profit margin of quoted manufacturing companies in Nigeria. Tertiary education taxes had negative and insignificant effect on net profit margin of quoted manufacturing companies in Nigeria.

Ogunsola (2023) investigated the influence of taxation on the economic development in Nigeria. The study adopted time series research method. The data used were obtained from secondary sources, which covered a period from 2015 to 2022. Using regression analysis, the study found that company income tax (CITX) and value added tax (VATX) positively and insignificantly influence real gross domestic product, however, the influence of education tax (EDTX) is negligible. Results also revealed that the influence of CITX on poverty index is negligible, while VATX and EDTX have negative and positive insignificant influence on poverty index respectively. Besides, findings revealed that CITX negatively and insignificantly influences life expectancy. While VATX positively and significantly influences life expectancy, the influence of EDTX is positive and insignificant. Moreover, results showed that CITX positively and insignificantly influences balance of trade, whereas the influence of VATX and EDTX is negative and insignificant.

Edori and Atabusi (2022) examined the nexus between direct taxes and total federal tax revenue of Nigeria. The study was anchored on the ex post facto form of research design. Time series data (secondary data) from 2005 to 2020 was collected from the Federal Inland Revenue service and was analysed using simple regression analysis. The study indicated that significant relationship exists between education tax and total tax revenue and petroleum profit tax and total tax revenue with a probability value of 0.000 and 0.002 respectively. Also, both education tax and petroleum profit tax have positive relationship with total tax revenue with R² values of 0.729 and 0.524 respectively.

Aliyu Abubakar Baliksu and Mustapha (2022) assessed empirically the impact of tax revenue on economic growth in Nigeria, spanning from 1981 to 2017. The study employed, time series data obtained from the CBN statistical bulletins, FIRS annual publications and National Bureau of Statistics (NBS) portal. To achieve the objectives of the study, OLS and ARDL techniques were employed to estimate the relationships and the dynamics and longrun effects of independent variables on dependent variable. ARDL bound test revealed that the variables are cointegrated while ARDL long-run estimation indicated that petroleum profit, value added tax and government domestic debt are significant and positively related to GDP. In addition, company income tax and customs and excise duties came out significant but have negative impact on economic growth.

Oladele (2021) examined the impact of tax compliance on economic development in Nigeria. A quantitative research design has been adopted having been found to be appropriate for the quantitative research model that underpins the study at hand through regression was adopted for the data analysis. The results of the study indicate that the tax compliance have positive impact on economic development in a time series data of Nigeria's Economy during 2003 – 2019. The linearity test revealed that linear relationship exists between tax compliance and standard of living in Nigeria. The research closes the knowledge gap induced by inconclusive evidence on the growth effects of human capital development and per capita income which most often have resulted in situations where results of researches done in developed economies are generalized to developing countries.

Ogbodo and Nweze (2021) reviewed on Effect of tax revenue on economic development: evidence from Nigeria. The methodology used in the study was Ex-post Facto research design. The study found that companies' income tax has a significant positive effect on per capita income of Nigeria; petroleum profit tax has a significant positive effect on per capita income of Nigeria. In this study education tax was no considered as a measure of tax revenue.

Clement, Ayobolawole and Oladimeji (2019) reviewed on tax revenue and economic development

in Nigeria. The data for the relevant variable of this study were extracted from the statistical bulletin of the Central Bank of Nigeria and human development report of United Nations Development Programme for the year under consideration in this study. The study revealed that taxation has a significant long run relationship with Nigeria's economic development. In the study of Okonkwo and Chukwu (2019). Reviewed on Government Tax Revenue and economics development in Nigeria: 1996-2017. The study adopted study obtained time series data. The government tax income has not significantly influenced economic development of Nigeria.

Obayori and Omekwe (2019) investigated the impact of value added tax (VAT) on economic growth in Nigeria from 1994–2018. In terms of methodology, secondary data were used and sourced from CBN statistical bulletin. Also, ADF unit root test and ARDL techniques were used. The study found that the value of VAT has a positive relationship with economic growth in Nigeria. Also, custom and excise duties revenue positively impacted on economic growth in Nigeria. Hence, it was concluded that Value Added Tax (VAT) as an indirect tax system in Nigeria has direct relationship with economic growth in Nigeria.

Ironkwe and Agu (2019) analyzed the relationship between total tax revenue and economic growth in Nigeria. Time series data on different types of total tax revenue and economic development from 1986-2016 were collected from Central Bank of Nigeria Statistical bulletin, Federal Inland Revenue Service and National Bureau of Statistics. Multiple regression analysis was used in analyzing the data 13. Their results indicated that there is a significant positive relationship between total tax revenue and unemployment and recommends that government should distribute its social welfare programmes in such a way to provide direct benefit to tax payers. This makes them believe that the portion of their hard earned money paid for purposes, is being effectively utilized by the government.

Oshiobugie and Akpokerere (2019) examined tax revenue and the Nigeria economy from 2000 – 2017. Secondary data were sourced from Central Bank of Nigeria Statistical Bulletin of various editions. The

study adopted the ex-post facto research design while ordinary least square regression techniques was used to process the used to process the data gathered using E-view 8.0 software. The null hypotheses (Ho) were tested at 5% level of significance. The findings revealed that there is insignificant effect of tax revenue on economic growth under the period study and concluded that personal income tax and company income tax affect economic growth in Nigeria either negatively or positively.

Osho, Augustine and Efuntade, Alani Olusegun (2019) examined the impact of taxation on investment, social and economic development in Nigeria. The secondary data were obtained from relevant literatures, Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics publications among other. Data were tested using the Ordinary Least Square Linear Regression model. From the Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics. The findings show that all the coefficients of the explanatory variables in model 1 and 2 are all statistically significant to gross domestic product and Gross Fixed Capital Formation (GFCF) except company income tax. The study concluded that, tax revenues are tools of both capital formation and economic growth to enhance investment, social and economic development of the country.

Ogudu, Kingsley and Akinlosotu (2018) examined the impact of corporate income tax on the performance of the manufacturing sector in Nigeria from 2013 – 2017. The ex-post facto research design was adopted for this study. The population of this study covered all the 23 registered manufacturing firms dealing with consumable foods in Nigeria. The sample of five manufacturing firms, dealing with consumable foods in Nigeria which represent 35% of the quoted manufacturing firms on the Nigerian Stock Exchange (NSE) market was selected for the study. This study made use of the fixed and random effect regression technique. The result showed that company income tax had direct significant impact on net income and return on equity of manufacturing companies in Nigeria.

Ojijo and Oluwatosin (2018) examined taxation and economic growth in resource rich country, a case of

Nigeria. They employed the linkage between availability of higher resources revenue and lower taxation effect of other revenue categories and the effects of these on growth. They used ordinary least square estimation techniques to analysis their data collected. They found out that taxation has a significant effect on real GDP growth rate.

Eyisi, Chioma and Nwaorgu (2015) ascertained the effects of taxation on microeconomics performance in Nigeria from 2002 to 2011. Data were collected from secondary sources. Three hypotheses were tested using ordinary least squares regression method. Their findings showed that government earnings from taxation will affect consumer spending and boost output production level.

III. METHODOLOGY

The research design adopted in this study is ex-post facto research design. An ex-post-facto research design is a systematic empirical inquiry that requires the use of variables which the researcher does not have the capacity to change its state or direction in the course of the study. Furthermore, the nature of data used in this study is basically secondary in nature. These data were sourced from Central Bank of Nigeria (CBN), Office of the Federal Inland Revenue Service and Annual Abstract of statistics of the National Bureau of Statistics. The data covered the periods from 1990 to 2023, indicating thirty-four (34) years sample observations.

Data Analysis Techniques

The data analysis technique to be adopted will depend on the outcome of the pre-estimation test. The Autoregressive distributed lag (ARDL) technique or the Error Correction Method (ECM) may be adopted for model estimation. ARDL is a least square method developed by Pesaran, Shin and Smith (2001) that allows us to include the lag values of the dependent and independent variables of a model while carrying out regression analysis. This test may be used because the literature behind it states that if the series are of different order of integration 1(0) and 1(1) but not 1(2), then the Eigen-Granger integration test which supports uniformity in the order of integration breaks down hence, ARDL bound test is the appropriate Co-

integrating technique for possible long run relationship among the series. In order to use the ARDL approach, Unit root test will be conducted because of the problem of non-stationarity (inconsistent mean and variance) of time series data, the Augmented Dickey-Fuller and the Philip Peron unit root tests will be employed for this.

Model Specification

A model is an abstraction from reality. It is a simplified representation of reality to analyse and understand economic phenomena. It can be used to predict outcomes, test hypotheses, and evaluate the potential impact of different economic policies/events. Theoretically, the analytical framework of this study was anchored on Diffusion Theory of Taxation because of its relevance to this study. Econometrically, the model of this study is functionally specified as follows:

$$LEX = (CIT, VAT, EDT, PIT) \quad (1)$$

The model above is mathematically specified as follows:

$$LEX_t = \beta_0 + \beta_1 CIT_t + \beta_2 VAT_t + \beta_3 EDT_t + \beta_4 PIT_t \quad (2)$$

The model above is econometrically specified as follows:

$$LEX_t = \beta_0 + \beta_1 CIT_t + \beta_2 VAT_t + \beta_3 EDT_t + \beta_4 PIT_t + \mu_t \quad (3)$$

The long-run ARDL specification of the model is expressed as:

$$\begin{aligned} \Delta \ln(LEX_t) = & \beta_0 + \beta_1 \Delta \ln(LEX_{t-1}) + \beta_2 \Delta \ln(CIT_{t-1}) + \beta_3 \Delta \ln(VAT_{t-1}) + \beta_4 \Delta \ln(EDT_{t-1}) + \beta_5 \Delta \ln(PIT_{t-1}) \\ & + \sum_{i=1}^p \delta_{1i} \Delta \ln(LEX_{t-i}) + \sum_{i=1}^q \delta_{2i} \Delta \ln(CIT_{t-i}) + \sum_{i=1}^p \delta_{3i} \Delta \ln(VAT_{t-i}) \\ & + \sum_{i=1}^q \delta_{4i} \Delta \ln(EDT_{t-i}) + \sum_{i=1}^p \delta_{5i} \Delta \ln(PIT_{t-i}) \\ & + \varepsilon_{1t} \end{aligned} \quad (4)$$

The short-run ARDL specification of the model is expressed as:

$$\begin{aligned} \Delta \ln(LEX_t) = & \delta_0 + \sum_{i=1}^p \delta_{1i} \Delta \ln(LEX_{t-i}) + \sum_{i=1}^q \delta_{2i} \Delta \ln(CIT_{t-i}) + \sum_{i=1}^p \delta_{3i} \Delta \ln(VAT_{t-i}) \\ & + \sum_{i=1}^q \delta_{4i} \Delta \ln(EDT_{t-i}) + \sum_{i=1}^p \delta_{5i} \Delta \ln(PIT_{t-i}) + \lambda ECM_{t-1} + \varepsilon_{14t} \end{aligned} \quad (5)$$

A Priori Expectation: $\beta_1 > 0$; $\beta_2 > 0$; $\beta_3 > 0$; $\beta_4 > 0$.

Descriptive Analysis

The descriptive statistics for the study variables are summarized in Table 1:

IV. RESULTS AND DISCUSSION

Table 1: Descriptive Statistics

	LEX	LTR	PCI	CIT	VAT	EDT	EDT
Mean	49.90060	64.97333	1818.260	786.3067	122.6880	684.1930	2210.641
Median	50.46850	63.53500	1912.900	507.8900	74.39000	441.5550	1371.670
Maximum	53.91800	79.54000	3201.000	4896.470	719.4400	3639.320	9061.440
Minimum	45.48700	51.08000	494.1000	12.27000	2.200000	11.80000	70.47000
Std. Dev.	2.695260	8.410763	768.6551	1018.456	150.1979	834.9840	2587.199
Skewness	-0.349757	0.173409	-0.229572	2.424525	2.187042	1.958668	1.494356
Kurtosis	1.797711	1.629462	2.125273	10.02819	9.251695	6.863190	4.144748
Jarque-Bera	2.418524	2.498322	1.219952	91.13597	72.77037	37.83719	12.80355
Probability	0.298417	0.286745	0.543364	0.000000	0.000000	0.000000	0.001659
Sum	1497.018	1949.200	54547.80	23589.20	3680.640	20525.79	66319.23
Sum Sq. Dev.	210.6684	2051.487	17134090	30080349	654222.5	20218749	1.94E+08

Source: Author's Computation, 2025 (EViews 12 Output).

Table 1 above presents the descriptive statistics of research variables (life expectancy, literacy rate, per capita income, company income tax, value-added tax, education tax and personal income tax) over a period of thirty-four years from 1990 to 2023. As shown in the table, life expectancy (LEX) recorded over the period a mean value of 49.9% with a maximum of 53.92% and minimum of 45.49% per annum. The standard deviation of life expectancy (LEX) is 2.69% and this indicates that life expectancy (LEX) has high dispersion from the mean over the study period (1990 - 2023). A high dispersion in life expectancy suggests that the health status and living conditions of the population were unstable or inconsistent over time. In addition, company income tax (CIT) recorded over the period a mean value of N786.31 billion with a maximum of N4896.47 billion and minimum of N12.27 billion per annum. The standard deviation of company income tax (CIT) is N1018.46 billion and this also indicates that company income tax (CIT) has high dispersion from the mean over the study period (1990 - 2023). High dispersion in company income tax (CIT) implies that the tax revenue collected from companies fluctuated significantly over the years. This reflects variability in corporate earnings, which may be driven by: Boom-and-bust cycles in key sectors (e.g., oil & gas, manufacturing). Furthermore, value-added tax (VAT) recorded over the period a

mean value of N122.68 billion with a maximum of N719.44 billion and minimum of N2.2 billion on per annum. The standard deviation of value-added tax (VAT) is N150.19 billion and this indicates that value-added tax (VAT) has low dispersion from the mean over the study period (1990 - 2023). This suggests that VAT revenue remained relatively stable over time, with minor fluctuations around its average value. Additionally, education tax (EDT) recorded over the period a mean value of N684.19 billion with a maximum of N3639.32 billion and minimum of N11.8 billion per annum. The standard deviation of education tax (EDT) is N834.98 billion on and this indicates that education tax (EDT) has low deviation from the mean over the study period (1990 - 2023). Low dispersion in education tax (EDT) implies that the collection and remittance of education tax have been administratively stable and policy-consistent. Lastly, personal income tax (PIT) recorded over the period a mean value of N2210.64 billion with a maximum of N9061.44 billion and minimum of N70.47 billion per annum. The standard deviation of personal income tax (PIT) is N2587.20 billion and this indicates personal income tax (PIT) has low deviation from the mean over the study period (1990 - 2023). This suggests that personal income tax (PIT) revenue remained relatively stable with minimal fluctuations around its average.

Unit Root Test

Testing of the unit roots of a series is a precondition to the existence of cointegration relationship. Therefore, this study first employed the popular Augmented Dickey-Fuller (ADF) unit root test to

investigate the stationarity of all the variables used. The results of the unit root test are presented in Table 2 below:

Table 2: Augmented Dickey-Fuller (ADF) Test Results

Variables	ADF				I(d)	Stationary @
	Level	Critical Value @ 5%	1 st Difference	Critical Value @ 5%		
<i>lnLEX_t</i>	0.652512	-2.954021	-4.496282***	-2.957110	I(1)	1 st Difference
<i>lnCIT_t</i>	-1.797937	-2.954021	-4.352493***	-2.957110	I(1)	1 st Difference
<i>lnVAT_t</i>	-0.314447	-2.971853	-3.958446***	-2.971853	I(1)	1 st Difference
<i>lnEDT_t</i>	-0.294022	-2.954021	-6.471154***	-2.957110	I(1)	1 st Difference
<i>lnPIT_t</i>	-4.601562***	-2.954021	-	-	I(0)	Level

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively

Source: Author's Computation, 2025 (EViews 12 Output).

Table 2 presents the summary results of the ADF Unit root tests carried out on all the variables in our model. The unit root test results showed that personal income tax (PIT) attained stability at levels. This is because the test statistic value of personal income tax (PIT) is greater than the Mackinnon critical value at 5% level of significance at level. This further indicates that personal income tax (PIT) was stationary at order zero [i.e., I(0)]. On the other hand, life expectancy (LEX), company income tax (CIT), value-added tax (VAT) and education tax (EDT) attained stability after first differencing. This is because their test statistic values are greater than the Mackinnon critical value at 5% level of significance at first difference. This further indicates that life expectancy (LEX), company income tax (CIT), value-added tax (VAT) and education tax (EDT) were integrated at order one [i.e., I(1)]. Conclusively, the attainment of mixed stationarity in the variables (that is stationary at order zero and stationary at order one) necessitated the use of ARDL in the estimation of the long run relationship among the variables and the error correction model.

Correlation Analysis

For the purpose of this study, correlation matrix is used to detect multicollinearity. The correlation matrix involves examination of correlation

coefficients between pairs of dependent and independent variables. The results of the correlation are presented in Table 3:

Table 3: Correlation Matrix

	<i>LEX_t</i>	<i>lnCIT_t</i>	<i>lnVAT_t</i>	<i>lnEDT_t</i>	<i>lnPIT_t</i>
<i>LEX_t</i>	1				
<i>lnCIT_t</i>	0.1937	1			
<i>lnVAT_t</i>	0.3913	0.4943	1		
<i>lnEDT_t</i>	0.2838	0.3874	0.5787	1	
<i>lnPIT_t</i>	0.0896	0.4834	0.2920	0.6619	1
	14	31	63	39	1

Source: Author's Computation, 2025 (EViews 12 Output).

The result of the correlation matrix in Table 3 indicated that company income tax, value-added tax, education tax and personal income tax) all have weak positive relationships with life expectancy (LEX). Hence, there is sufficient statistical evidence to conclude that there is absence of multicollinearity problem among the independent variables.

4.4.2 ARDL Bound Cointegration Test

Table 4: ARDL Bounds Cointegration Test

	Critical Value Bound	F-Statistics
$F_{LEX}(\ln CIT_t / \ln CIT_t, \ln VAT_t, \ln EDT_t, \ln PIT_t)$		6.749744*
		**
K = 4		
Significance	I(0) Bound	I(1) Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Note: Null hypothesis: No level relationship; K = number of regressors; *, ** and *** denote significance at 10%, 5% and 1% level, respectively.

Source: Author's Computation, 2025 (EViews 12 Output).

In order to determine if there is cointegration among the variables, a bounds test was conducted. The result of the ARDL Bounds correlation test in Table 4 showed that the bound test indicates the presence of a long-run relationship among life expectancy (LEX), company income tax (CIT), value-added tax (VAT), education tax (EDT) and personal income tax (PIT) given that the F-statistics value of 6.749744 is higher than the 5% upper bound critical value of 3.49. By this, the null hypothesis is rejected, which leads to the study concluding that there is a cointegrating relationship among the variables. The confirmation of long-run dynamics among the variables further necessitated the estimation of the extent of the relationship between the dependent and independent variables through estimation of the Autoregressive Distributed Lag (ARDL) model.

4.4.3 Short-Run and Long-Run Dynamics of Autoregressive Distributed Lag (ARDL) Model

The short-run and long-run dynamic effect of company income tax, value-added tax, education tax and personal income tax on life expectancy in Nigeria estimated using the Autoregressive Distributed Lag (ARDL) approach. The results of the estimation are presented in Table 5:

Table 5: Estimated Long-Run and Short-Run Coefficients of ARDL

Dependent Variable = LEX_t				
Short-Run Results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
$D(\ln LEX_{t-1})$	-0.141448	0.172178	-0.821520	0.4288
$D(\ln LEX_{t-2})$	0.119387	0.215247	0.554649	0.5902
$D(\ln LEX_{t-3})$	0.346168	0.192242	1.800689	0.0992
$D(\ln CIT_t)$	0.010795	0.003833	2.816429	0.0168
$D(\ln CIT_{t-1})$	-0.005912	0.005073	-1.165296	0.2685
$D(\ln CIT_{t-2})$	-0.003696	0.004299	-0.859826	0.4082
$D(\ln VAT_t)$	0.000561	0.006692	0.083784	0.9347
$D(\ln EDT_t)$	-0.017334	0.000858	-20.19750	0.0315
$D(\ln EDT_{t-1})$	0.028468	0.000120	236.4630	0.0027
$D(\ln EDT_{t-2})$	-0.003775	0.005412	-0.697514	0.5000
$D(\ln PIT_t)$	0.017531	0.001062	16.51312	0.0385
$D(\ln PIT_{t-1})$	-0.045939	0.001419	-32.37943	0.0197
CointEq(-1)*	-0.446067	0.091057	-4.898751	0.0005
$R^2 = 0.752777$				
Adjusted $R^2 = 0.567360$				
Durbin-Watson stat = 2.314283				
Long-Run Results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
$\ln CIT_t$	0.013619	0.000865	15.75256	0.0404
$\ln VAT_t$	0.002637	0.002547	1.035243	0.3228
$\ln EDT_t$	-0.043128	0.001815	-23.76815	0.0268
$\ln PIT_t$	0.044664	0.001462	30.55305	0.0208
C	3.709164	0.001071	3464.858	0.0002
EC = LOG(LEX) - (0.0136*LOG(CIT) + 0.0026*LOG(VAT) - 0.0431*LOG(EDT) + 0.0447*LOG(PIT) + 3.7092)				

Source: Author's Computation, 2025 (EViews 12 Output).

Interpretation of Short-Run and Long-Run Autoregressive Distributed Lag (ARDL) Estimation Model Results

Company Income Tax (CIT) and Life Expectancy (LEX)

The short-run estimates of the ARDL model are shown in Table 5. The results revealed that company income tax has a positive and significant effect on life expectancy in Nigeria. This is evident by the positive coefficient value (0.010795) of company income tax at the initial level and its p-value (0.0168) which is less than 0.05. This implies that a unit

increase in company income tax will lead to 0.010795 increase in life expectancy in the short-run. Also, the long-run estimates of the ARDL model results revealed that company income tax has a positive and significant effect on life expectancy in Nigeria. This is evident by the positive coefficient value (0.013619) of company income tax and its p-value (0.0404) which is less than 0.05. This implies that a unit increase in company income tax will lead to 0.013619 increase in life expectancy in the long-run.

Value-Added Tax (VAT) and Life Expectancy (LEX)
Furthermore, the short-run estimates of the ARDL model are shown in Table 5. The results revealed that value-added tax has a positive and non-significant effect on life expectancy in Nigeria. This is evident by the positive coefficient value (0.000561) of value-added tax at initial level and its p-value (0.9347) which is greater than 0.05. This implies that a unit increase in value-added tax will lead to 0.000561 increase in life expectancy in the short-run. Also, the long-run estimates of the ARDL model results revealed that value-added tax has a positive and non-significant effect on life expectancy in Nigeria. This is evident by the positive coefficient value (0.002637) of value-added tax and its p-value (0.3228) which is greater than 0.05. This implies that a unit increase in value-added tax will lead to 0.002637 increase in life expectancy in the long-run.

Education Tax (EDT) and Life Expectancy (LEX)
Moreover, the short-run estimates of the ARDL model are shown in Table 5. The results revealed that education tax have negative and significant effect on life expectancy in Nigeria. This is evident by the negative coefficient value (-0.017334) of education tax at initial level and its p-value (0.0315) which is less than 0.05. This implies that a unit increase in the education tax will lead to 0.017334 decrease in life expectancy in the short-run. Also, the long-run estimates of the ARDL model results revealed that education tax have negative and significant effect on life expectancy in Nigeria. This is evident by the negative coefficient value (0.043128) of education tax and its p-value (0.0268) which is less than 0.05. This implies that a unit increase in education tax will lead to 0.043128 decrease in life expectancy in the long-run.

Personal Income Tax (PIT) and Life Expectancy (LEX)

Moreover, the short-run estimates of the ARDL model are shown in Table 5. The results revealed that personal income tax have positive and significant effect on life expectancy in Nigeria. This is evident by the positive coefficient value (0.017531) of personal income tax at initial level and its p-value (0.0385) which is less than 0.05. This implies that a unit increase in the personal income tax will lead to 0.017531 increase in life expectancy in the short-run. Also, the long-run estimates of the ARDL model results revealed that personal income tax have positive and significant effect on life expectancy in Nigeria. This is evident by the positive coefficient value (0.044664) of personal income tax and its p-value (0.0208) which is less than 0.05. This implies that a unit increase in personal income tax will lead to 0.044664 increase in life expectancy in the long-run.

Interpretation of CointEq (-1) Result

The results of the short run dynamic coefficients associated with the long-run relationships obtained from the error correction model are given in Table 5. The signs of the short-run dynamic interactions are consistent with that of the long run relationship. The estimated error correction coefficient of -0.446067 (with p-value of 0.0005) is highly significant, has the correct sign, and implies a low speed of adjustment to equilibrium after a shock. This implies that approximately 45% of disequilibria from the previous year's shock converge back to the long run equilibrium in the current year.

Interpretation of Adjusted R-Squared (Adj. R²) Value

The Adjusted R-squared value of 0.567360 from the results of the short-run estimates of the ARDL model in Table 5 indicated that the estimated model is well fitted as the systematic changes in explanatory variables (company income tax, value-added tax, education tax and personal income tax) explained approximately 57 percent (R-squared) variation in life expectancy while the remaining 43% is explained by other variables of factors outside the model.

Interpretation of Durbin-Watson Statistic Value
 Lastly, Durbin-Watson stat of 2.314283 which is greater than 2 indicates the absence of serial autocorrelation.

Post-Estimation Tests

The results of the diagnostic tests are presented and discussed below:

Table 6: Post-Estimation Test Results

Test	Null Hypothesis	X ² Value	X ² Prob	Remark
Jarque-Bera	Normal distribution exists	1.4034 99	0.4957 17	Normal residuals
Breusch-Godfrey	Serial correlation does not exist	1.5648 12	0.2611	Serial independence
Breusch-Pagan-Godfrey	Homoscedasticity exists	0.6637 37	0.7833	Constant Variance
Ramsey RESET	Model is stable	0.3175 02	0.5855	correctly specified model

Source: Author’s Computation, 2025 (EViews 12 Output).

The Jarque Bera (Normality) test result in Table 6 shows that the model is normally distributed. Also, the Breusch-Godfrey Serial Correlation LM test reveals that the model has no serial correlation problem. Additionally, the Breusch-Pagan-Godfrey heteroskedasticity test shows the model has homoscedasticity. This implies that relevant variables were not omitted. Lastly, the Ramsey RESET test result indicates that the model is correctly specified. This implies that the functional form of the model is correct.

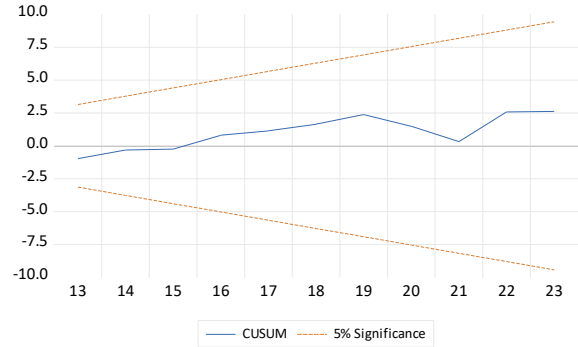


Figure 1: Stability Cusum Test

The cumulative sum (CUSUM) indicates that the CUSUM line stayed within the 5 percent critical bound while neither did CUSUM plot crosses the 5 percent critical lines. The implication of this is that there is stability of the long-run coefficients of the study variables.

Discussion of Findings

This study has empirically analyzed the time series data sourced to determine the effect of taxation on economic development in Nigeria from 1990 to 2023 using Autoregressive Distributive Lag (ARDL) estimation technique. First, the results of the short-run and long-run estimates revealed that company income tax has positive and significant effect on life expectancy in Nigeria both in the short-run and in the long-run. Also, value-added tax has positive and non-significant effect on life expectancy in Nigeria both in the short-run and in the long-run. Furthermore, education tax have negative and significant effect on life expectancy in Nigeria both in the short-run and in the long-run. Lastly, personal income tax have positive and significant effect on life expectancy in Nigeria both in the short-run and in the long-run. The finding also relates to the finding of Ojijo and Oluwatosin (2018) who found that company income tax has a significantly positive relationship with life expectancy in the long run. Furthermore, Osho, Augustine and Efuntade, Alani Olusegun (2019) revealed that education tax impacted negatively on investment, social and economic development in Nigeria although the impact was insignificant. Also, Olaoye, Yunus and Opefolu (2023) found that personal income tax contribute positively and significantly to economic development in Nigeria.

V. SUMMARY, CONCLUSION AND
RECOMMENDATIONS

Conclusion

The desire of any government to maximize revenue generated through taxes to enhance economic development cannot be overemphasized. This is because a system of tax avails itself as a veritable tool that mobilizes a nation's internal resources and it lends itself to creating an environment that is conducive for the promotion of economic development. Therefore, taxation plays a major role in assisting a country to meet its needs and promote self-reliance by generating revenue for government to fund different projects that will improve health outcomes. Drawing from the foregoing, this study empirically examined the effect of taxation on the health outcomes in Nigeria. Premised on the findings, the study concluded that taxation play a vital role in the maintenance of health outcomes in Nigeria.

Recommendations

The following recommendations are proffered based on the findings of this study:

First, the government should strengthen the efficiency and transparency of tax revenue utilization, particularly revenues generated from company income tax and personal income tax, which were found to have a positive and significant impact on life expectancy. This can be achieved by ensuring that a substantial proportion of these revenues is directly allocated to the health sector, including investments in primary healthcare, medical infrastructure, and preventive health programmes. Improved monitoring and accountability mechanisms should also be put in place to ensure that tax funds are effectively translated into better healthcare services and outcomes.

Second, there is a need to reform and optimize the structure and administration of value-added tax (VAT) to enhance its contribution to health outcomes. Although VAT showed a positive but non-significant effect, improving tax compliance, expanding the tax base, and reducing leakages can increase its revenue-generating capacity.

Third, urgent attention should be given to the negative and significant effect of education tax on life expectancy. Policymakers should review the

allocation and management of education tax funds to ensure efficiency and alignment with broader human capital development goals, including health. Since education and health are interrelated, better utilization of education tax revenue toward improving educational quality, health awareness, and school-based health programmes can indirectly enhance health outcomes. Strengthening coordination between the education and health sectors will help maximize the developmental impact of taxation on life expectancy in Nigeria.

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