



Moderating Effect Of Firm Size On Tertiary Education Tax And Financial Performance Of Listed Deposit Money Banks In Nigeria

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Abstract

This study investigated the moderating role of firm size on the relationship between tertiary education tax and the financial performance of listed deposit money banks (DMBs) in Nigeria. The population comprises 14 DMBs listed in the Nigerian Exchange Group as at December 31, 2023. A purposive sampling technique was employed to select a sample of 12 banks that have been consistently listed and have maintained complete and accessible financial data throughout the 15-year study period spanning from 2009 to 2023. Using a panel data approach and pooled regression analysis, the research examines two models: one without moderation and another incorporating the interaction between Tertiary Education Tax (TET) and firm size. The results without moderation reveal a positive and statistically significant effect of TET on Return on Asset (ROA), while firm size exerts a negative and significant influence on profitability. However, when firm size is introduced as a moderating variable, the effect of TET becomes negative and statistically significant, whereas the interaction term (TET \times Firm Size) is positive and highly significant. The explanatory power of the model improves considerably, with the adjusted R² increasing from 0.25 to 0.783. These findings underscore the importance of considering firm-specific characteristics, particularly size, in evaluating the financial implications of tax policies on corporate performance. Based on these results, it is recommended that, larger banks should be encouraged to view TET not merely as a statutory obligation but as a tool for enhancing institutional performance through strategic investments in human capital, training, and educational partnerships. Government policy could reinforce this approach by offering performance-based tax rebates or credits to banks that channel TET funds toward measurable outcomes in education or innovation.

Keywords: *Tertiary Education Tax, Firm Size, Financial Performance, Return on Assets, Deposit Money Banks.*

I. Introduction

Taxation on individuals and corporate entities remain the biggest revenue earner deployed by governments to finance expenditures and state development activities. (Nawang Sari et al., 2022), this is particularly the case for many non-oil producing countries.

The British colonial administration introduced formal taxation in Nigeria in the early 20th century, with the first tax ordinances primarily targeting individuals (Okonjo, 1998). Corporate taxation was not a significant focus during this period. The first comprehensive tax legislation in Nigeria was the Income Tax Ordinance of 1940, which applied to both individuals and companies (Okauru, 2012). This ordinance laid the foundation for modern tax administration in Nigeria. It was primarily designed to generate revenue for the colonial administration and was later modified to suit the needs of an independent Nigeria (Asada, 2005).

Corporate taxes in Nigeria are administered on behalf of the government by the Federal Inland Revenue Service (FIRS) (Uadiale, 2010). These taxes are essential fiscal tools for regulating economic activities, redistributing wealth, and funding public services (OECD, 2021). According to Adebisi and Gbegi (2013), corporate taxation policies can influence firms' decisions regarding investment, financing, and operations, thereby impacting their financial performance. The level of corporate taxation may also affect foreign direct investment (FDI) inflows, as high tax rates can discourage multinational corporations from investing in a country (Desai et al., 2004).

Education tax serves as a pivotal fiscal policy instrument globally, enabling governments to fund higher education, enhance human capital



development, and bridge educational funding gaps (OECD, 2022). By imposing specific education taxes, nations secure stable financial resources for tertiary institutions, promoting sustained academic excellence and workforce advancement (World Bank, 2023). For example, Australia's Higher Education Loan Program (HELP) offers income-contingent loans financed through taxation, facilitating affordable access to tertiary education without immediate financial strain (Parliamentary Budget Office, 2016). Similarly, Scandinavian countries employ progressive taxation to fully subsidize tertiary education, resulting in high literacy rates and robust economic productivity (OECD, 2022).

In Nigeria, the Tertiary Education Tax (TET), which is a component of corporate taxes, was established in 1993 under the Education Tax Act to mitigate chronic underfunding in higher education (Odusola, 2006). Administered by the Federal Inland Revenue Service (FIRS) and managed by the Tertiary Education Trust Fund (TETFund), TET imposes a 2% levy on the assessable profits of registered Nigerian companies (Muhammad & Bakwai, 2015). These funds are allocated for infrastructural development, research, and faculty training, aiming to elevate the quality of tertiary education and its contribution to national development (Odusola, 2006). The Tertiary Education Tax (TET) rate in Nigeria was increased from 2% to 2.5% through the Finance Act 2021 (PricewaterhouseCoopers, 2022) and recently increased from 2.5% to 3% (Finance Act, 2023). However, while TET's objectives are well-defined, its impact on corporate financial performance, particularly within Nigeria's banking sector, remains underexplored.

Internationally, education tax policies yield diverse economic outcomes. In the United States, tax incentives like the American Opportunity Tax Credit (AOTC) and Lifetime Learning Credit (LLC) provide tax relief for tuition payments, indirectly supporting higher education funding and accessibility (Zidar, 2019). Germany's dual education system, financed through corporate taxation and direct government grants, ensures continuous workforce development, bolstering its industrial economy (IMF, 2022). These instances underscore the influence of education tax policies on human capital development and corporate financial outcomes.

Despite the advantages of education taxation, its financial implications for businesses are subject to debate. While some firms regard education tax as a social responsibility contributing

to long-term economic growth, others view it as an additional financial burden potentially diminishing profitability and investment capacity. Large firms often possess the resources to absorb tax burdens and benefit from corporate social responsibility (CSR) incentives, whereas small and medium-sized enterprises (SMEs) may face compliance challenges, affecting their financial performance differently (Mikailu & Garba, 2014).

Furthermore, existing literature predominantly examines the role of education tax policies in funding education rather than their impact on specific industries such as banking. Given the critical role of Deposit Money Banks (DMBs) in economic stability and financial intermediation, understanding how TET influences their financial outcomes is essential. This study aims to bridge this gap by analyzing the moderating effect of firm size on the relationship between TET and the financial performance of DMBs in Nigeria. The findings will offer valuable insights for policymakers, regulators, and corporate stakeholders, promoting a balanced fiscal framework that aligns educational development with corporate sustainability.

II. Statement of the Problem

Education tax serves as a vital tool for funding tertiary education and fostering national development, yet its financial impact on businesses remains a subject of debate. Some studies (Jolaiya, 2024; Adu et al., 2024; Salem & Qutait, 2023; Eyide & Nzewi, 2021) suggest that mandatory education taxes, such as the Tertiary Education Tax (TET), impose additional financial burdens on corporations, potentially reducing profitability, investment capacity, and operational efficiency. Conversely, other scholars (Adefunke & Usiomon, 2022; Ologbenla, 2022; Abiola et al., 2022) argue that education taxes contribute to long-term economic stability by enhancing human capital development, leading to improved productivity and sustainable economic growth. Additionally, Fakile et al. (2022) and Ben-Ali & Zouaghi (2022) posit that large firms may mitigate the impact of education tax through strategic tax planning, while smaller firms struggle with compliance, affecting their financial outcomes disproportionately.

In Nigeria, where the TET rate has recently increased from 2.5% to 3% (Finance Act, 2023), Deposit Money Banks (DMBs) are confronted with significant financial and operational challenges. The banking sector is already subject to multiple tax obligations and stringent regulatory capital requirements, which



may interact with TET liabilities to influence banks' lending capabilities, investment decisions, and overall financial performance. Despite the critical role of banks in economic development, limited research has explored the specific effects of TET on their financial outcomes, leaving an empirical gap in understanding how this tax influences profitability, liquidity, and shareholder value.

Existing studies have primarily focused on the general impact of corporate taxation, often overlooking the unique nature of education tax and its implications for financial institutions. Furthermore, the role of firm size in moderating the relationship between TET and financial performance remains underexplored. Large banks may possess stronger financial buffers and more efficient tax planning mechanisms, whereas smaller banks may experience greater financial strain due to higher tax burdens.

This gap in research poses a challenge for policymakers seeking to balance the need for sustainable education funding with economic stability. Without empirical clarity, education tax policies risk either overburdening banks, potentially constraining credit availability and economic growth or failing to optimize government revenue. Therefore, a comprehensive investigation into the moderating effect of firm size on the relationship between TET and the financial performance of Nigerian DMBs is essential. The findings of this study will provide valuable insights for policymakers, regulators, and corporate stakeholders, ensuring a more balanced fiscal framework that aligns with both educational development and financial sustainability.

III. Research Questions:

1. What is the effect of Tertiary Education Tax on the Return on Assets (ROA) of listed deposit money banks in Nigeria?
2. How does Firm Size (FS) affect the relationship between Tertiary Education Tax and the Return on Assets (ROA) of listed deposit money banks in Nigeria?

IV. Objective of the Study

The main objective of this study is to examine the impact of Tertiary Education Tax on the performance of listed deposit money banks in Nigeria.

The following are the specific objectives:

1. To examine the effect of Tertiary Education Tax on the Return on Assets (ROA) of listed deposit money banks in Nigeria.

2. To investigate the effect of Firm Size (FS) on the relationship between Tertiary Education Tax and the Return on Assets (ROA) of listed deposit money banks in Nigeria.

V. Statement of Hypotheses

1. H_{01} : Tertiary Education Tax has no significant effect on the Return on Assets (ROA) of listed deposit money banks in Nigeria.
2. H_{02} : Firm Size (FS) has no significant influence on the relationship between Tertiary Education Tax and the Return on Assets (ROA) of listed deposit money banks in Nigeria.

VI. Conceptual Framework

Relevant concepts as used in this study are defined below. They include the concepts of Tertiary Education Tax, financial performance proxied by Return on Asset and Firm Size.

6.1 Tertiary Education Tax (TET)

The Tertiary Education Tax (TET) is a specialized tax levied on the assessable profits of companies operating in Nigeria to provide sustainable funding for higher education (FIRS, 2023). Established under the Tertiary Education Trust Fund (TETFund) Act of 2011, this tax serves as a critical financial mechanism for enhancing infrastructure, research, and academic development in universities, polytechnics, and colleges of education (Federal Inland Revenue Service, 2023). The tax rate was initially set at 2% before being increased to 2.5% in 2021 and subsequently to 3% in 2023, reflecting the government's commitment to increasing education funding (FIRS, 2023).

According to Okafor (2022), education tax is an earmarked tax, meaning its proceeds are exclusively allocated to a particular sector—in this case, tertiary education. The revenue generated through TET is distributed among higher education institutions in Nigeria in a ratio of 2:1:1, favoring universities over polytechnics and colleges of education (TETFund, 2022). The rationale behind this distribution is to strengthen university education, given its role in producing high-skilled labor for economic development (Adetunji & Uche, 2021).

6.2 Firm Size

Firm size is a critical determinant of a company's financial and operational capabilities. It is commonly assessed using metrics such as total assets, annual revenue, market capitalization, or workforce size (Dang et al., 2018). Various



scholars have provided distinct definitions of firm size based on different analytical perspectives. For instance, Hall and Weiss (1967) describe firm size as the total volume of resources controlled by an entity, which directly impacts its profitability and competitive position. Penrose (1959) defines firm size in terms of its productive capacity, emphasizing that a company's expansion and strategic growth decisions shape its overall scale. In the context of this study, firm size is quantified using the natural logarithm of total assets. It functions as a moderating variable, influencing the interaction between tertiary education tax (TET) and financial performance, thereby providing deeper insights into the role of firm size in corporate tax obligations and financial outcomes.

6.3 Financial performance

Financial performance refers to a company's ability to achieve its primary objective of maximizing shareholder wealth while maintaining profitability. It serves as a key indicator of a firm's overall success and sustainability. Financial performance is typically assessed using various financial metrics, including return on assets (ROA), return on equity (ROE), net profit margin, and earnings per share (EPS) (Feng et al., 2017).

Ahmad et al. (2023) describe firm performance as a tool to measure a company's growth and profitability over time. In the context of this study, financial performance is specifically measured using Return on Assets (ROA), which evaluates how efficiently a company utilizes its assets to generate profits (Ahmad et al., 2023).

ROA is a widely used tool by investors, analysts, and management to determine a company's overall financial performance and asset productivity (Gitman & Zutter, 2015). A higher ROA indicates that a company is efficiently leveraging its assets to generate revenue, whereas a lower ROA may suggest inefficiencies in asset utilization, excessive operational costs, or poor financial management (Brigham & Ehrhardt, 2019).

VII. Theoretical Framework

Agency Theory, first introduced by Jensen and Meckling (1976), provides a foundational perspective for examining the relationship between corporate taxation, managerial decision-making, and financial performance, particularly within Nigerian deposit money banks. This theory describes the principal-agent relationship, where shareholders (principals)

entrust managers (agents) with overseeing company operations. However, due to the separation of ownership and control, managers may not always act in the best interests of shareholders, potentially prioritizing their own incentives over corporate financial performance and efficiency (Fama & Jensen, 1983).

In the realm of corporate taxation, Agency Theory suggests that tax obligations influence managerial behavior in different ways. On the one hand, high corporate tax rates can reduce the free cash flow available to managers, potentially discouraging wasteful spending and aligning their decisions with shareholder value (Jensen, 1986). On the other hand, complex tax regulations may create opportunities for tax avoidance or aggressive tax planning, which could either benefit or harm shareholders depending on managerial intentions (Desai & Dharmapala, 2009). Within the Nigerian banking sector, where corporate governance frameworks are still developing, the balance between compliance, tax planning, and financial performance remains a critical issue.

The highly regulated nature of the banking industry further amplifies the principal-agent challenge, as managerial tax decisions directly impact long-term financial stability and shareholder wealth (Shleifer & Vishny, 1997). Effective corporate governance mechanisms, such as oversight by boards of directors and regulatory authorities, are essential in ensuring that managers do not exploit tax loopholes for personal gain at the expense of firm performance (Armstrong et al., 2012). This is particularly significant in Nigeria, where the banking sector is closely monitored to maintain financial stability and economic growth. By applying Agency Theory, this study aims to investigate the implications of corporate taxation on financial performance in Nigerian deposit money banks while acknowledging the potential for agency conflicts. The theory underscores the importance of aligning managerial incentives with shareholder objectives through governance structures and regulatory frameworks that promote transparency and accountability. Ultimately, understanding how taxation interacts with managerial decision-making provides valuable insights into corporate profitability and financial sustainability within the banking industry (Graham et al., 2017).

VIII. Empirical Review

Lasisi and Fijabi (2023) examined the effect of corporate taxes on the financial performance of listed Information and



Communication Technology (ICT) companies in Nigeria, utilizing company income tax and education tax as proxies for corporate taxes and profit after tax as the financial performance indicator. The study employed an ex post facto research design, with data sourced from the annual reports of six ICT firms over five years (2018-2022), and analyzed using regression analysis. Findings reveal a positive and significant relationship between company income tax and financial performance, while education tax has a significant negative impact. The study highlighted the necessity for governmental tax policies that encourage voluntary compliance through reduced tax rates, enhanced public awareness, and better infrastructure, to foster improved financial performance in the ICT sector. Despite its contributions, the study showed potential limitations in its scope and the generalizability of its findings across different sectors.

Sweetwilliams et al. (2023) investigated the effect of corporate tax on the financial performance of listed consumer goods companies in Nigeria from 2011 to 2021. Using secondary data from 16 firms, the random effect panel regression results revealed that company income tax has a significant negative effect on financial performance, while education tax has a significant positive effect, and VAT negatively impacts performance. These findings suggest that increasing corporate tax burdens can reduce profitability, whereas education taxes may enhance financial outcomes. The study recommended more tax exemptions to improve net income for firms. This research contributes to the ongoing debate on taxation's role in firm performance, aligning with prior studies that present mixed results on the impact of corporate taxes (Oladipo et al., 2019; Taiwo & Oyedokun, 2022).

Eneisik et al. (2023) investigated the impact of corporate taxes on the financial performance of quoted manufacturing companies in Nigeria, utilizing a sample of thirty out of sixty listed companies. Employing an ex-post facto research design and analyzing panel data from 2006 to 2020, the researchers aimed to address discrepancies in existing literature regarding the relationship between corporate taxes and financial performance metrics such as return on equity, return on capital employed, and net profit margin. They used secondary data from audited financial reports and conducted panel least squares regression analysis, including pooled effect, fixed effect, and random effect models, with the Hausman test confirming the fixed effect model as

the preferred method. The findings revealed that while capital gains tax significantly affected return on capital employed and net profit margin, the other taxes (companies' income tax and tertiary education tax) had insignificant effects. The study's results were instrumental in highlighting the mixed impacts of corporate taxes on financial performance and provided recommendations for policy adjustments to mitigate tax burdens and enhance financial outcomes for manufacturing firms. However, the study acknowledged limitations such as reliance on secondary data, which could affect the accuracy and completeness of the results.

Okoror et al. (2023) conducted a study titled "Effect of Education Tax on Academic Development of Tertiary Institutions in Nigeria" to explore the relationship between education tax (TETFUND) and academic development in Nigerian tertiary institutions. The study utilized secondary data from TETFUND and the National Bureau of Statistics covering a 20-year period from 1999 to 2018. The population for the study comprised all Nigerian tertiary institutions, with a sample size of 20 yearly observations. The researchers adopted purposive sampling, focusing on aggregated national data. Using the Ordinary Least Squares (OLS) regression technique for analysis, they found a statistically significant positive relationship between TETFUND disbursement and academic development ($R^2 = 0.426$; $p < 0.05$). However, the study's predictive power was modest, and over 50% of variations were unexplained by the model. A notable critique is the lack of granularity—data was not disaggregated across institutions or regions, limiting insights into differential impacts across diverse contexts.

Ubesie et al. (2022) comprehensively examined the impact of education tax on the financial performance of firms in Nigeria's consumer products industry. Employing an ex-post facto research design, the researchers utilized a sample of five firms selected through random sampling from a population of nineteen. The study drew on secondary data from corporate annual reports and the Nigeria Stock Exchange fact book, analyzing these using descriptive statistics, correlation, and regression analysis. The findings revealed that while education tax had an insignificant yet positive effect on return on investment, it significantly and positively influenced both return on equity and earnings per share. These results underscored the relevance of education tax as a predictor of financial



performance, suggesting that firms should focus on increasing sales revenue and investing in profitable assets. Moreover, the researchers recommended that the government create a more enabling environment for companies, consider reducing the education tax rate, and that firms enhance their profitability and cost-efficiency to boost their earnings per share.

Mikailu and Aminu examined the impact of education tax and investment in human capital on economic growth in Nigeria, covering a period from 1995 to 2019. The study utilized the Non-Linear Autoregressive Distributed Lag (Non-Linear ARDL) Model of cointegration to analyze the relationship between these variables. Data was sourced from the World Development Indicators (WDI, 2019) and Statistical Bulletin (online database, 2019), ensuring comprehensive and reliable macroeconomic information. The findings indicated a positive and significant effect of education tax and investment in human capital on Nigeria's long-term economic growth, although the short-term impact of education tax was positive but insignificant. These results underscored the importance of sustained investment in education and effective tax policies for fostering economic growth. The study provided valuable insights for policymakers, advocating for a suitable environment for macro-economic stability and shared responsibility in financing education among government, students, parents, employers, and other stakeholders. However, the study did not mention any explicit defects, though potential limitations might include the focus on specific variables and reliance on available data, which could have inherent constraints.

Inyiama and Nkechinyere (2016) investigated the impact of Company Income Tax (CIT) and Tertiary Education Tax (TEDT) on Nigeria's Gross Domestic Product (GDP), utilizing time series data from various authoritative sources such as the Central Bank of Nigeria and the Federal Inland Revenue Service. Employing regression and correlation analyses, the research found that both CIT and TEDT had a significant and positive effect on GDP, with robust correlations of 97.60% and 94.99% respectively. The study also highlighted that non-oil revenues, particularly CIT and TEDT, contributed substantially to economic growth, emphasizing the importance of efficient tax collection and administration. Despite the positive findings, challenges such as tax evasion, avoidance, and the administrative confusion between federal and state authorities were noted. The authors recommended strategies to enhance

tax revenue collection, reduce administrative costs, and address systemic bottlenecks, underscoring the need for clear delineation of tax collection responsibilities to prevent conflicts and double taxation.

IX. Methodology

This research utilizes an ex post facto design to explore how firm size moderates the relationship between tertiary education tax and the financial performance of deposit money banks in Nigeria. This design is well-suited for the study as it facilitates an evaluation of relationships where the variables of interest—namely tertiary education tax (independent variable) and financial performance (dependent variable, represented by return on assets)—are beyond the control of the researcher and have already occurred.

The analysis spans a 15-year period from 2009 to 2023, offering a robust temporal window to examine how tax policies have influenced bank performance over time. This extended period allows for meaningful insights into long-term patterns and structural effects within the banking sector.

The target population comprises 14 deposit money banks (DMBs) listed on the Nigerian Exchange Group as at December 31, 2023. From this population, a sample of 12 banks was selected using purposive sampling. The selection criteria focused on institutions that maintained consistent or significant listing statuses during the study period and had complete, publicly accessible financial records. This criterion ensures that the chosen sample is both representative and data-rich, thereby enhancing the reliability and validity of the study's findings.

Data used in the study were entirely secondary in nature, drawn from the audited financial statements of the selected banks. These documents were sourced from reputable platforms such as the Nigerian Exchange Group (NGX), official websites of the respective banks, and trusted financial databases like African Financials. The datasets captured key financial metrics necessary for the study, including figures required to calculate Return on Assets (ROA) and amounts related to Tertiary Education Tax (TET) under the Company Income Tax (CIT) obligations.

To assess the effect of tertiary education tax on financial performance, as well as the moderating role of firm size, the study adopts a pooled regression analysis. This statistical technique is appropriate for estimating the extent to which the independent and moderating variables



influence the dependent variable. The model is mathematically expressed as follows:

Table 1: Measurement of Research Proxies

Variable	Meaning	Measurement	Source
TET	Tertiary Education Tax	2% and 2.5% (as applicable) x Profit Before Taxation (Natural log used)	Nnamdi & Ike's (2020); Sweetwilliams et al. (2023)
ROA	Return on Asset	Profit Before Tax/Total Asset) x 100	Salem & Qutait (2023); Odusina (2023)
FS	Firm Size	Natural Log of Total Asset ln(total asset)	Salem & Qutait (2023); Odusina (2023)

Source: adapted from Wirianata et al. (2024)

The model for this study is adapted from Eneisik et al. (2023). Corporate taxes and financial performance of quoted manufacturing companies in Nigeria.

Base Model:

$$ROE_{it} = \beta_0 + \beta_1 CIT_{it} + \beta_2 CGT_{it} + \beta_3 TET_{it} + \epsilon_{it}$$

Where:

CIT = Company Income Tax

CGT = Capital Gain Tax

TET = Tertiary Education Tax

ROE = Return on Equity

ϵ_{it} = Slope

Adapted Model:

$$ROA_{it} = \beta_0 + \beta_1 TET_{it} + \beta_2 FIRMSIZE_{it} + \epsilon_{it}$$

Moderated Model:

$$ROA_{it} = \beta_0 + \beta_1 TET_{it} + \beta_2 FS_{it} + \epsilon_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 TET_{it} + \beta_2 FS_{it} + \beta_3 TET_FIRMSIZE_{it} + \epsilon_{it}$$

Where:

ROA_{it} = Return on Asset for bank i at time t

TET_{it} = Tertiary Education Tax for bank i at time t

$FIRMSIZE_{it}$ = Size of bank i at time t

$TET \times FIRMSIZE$ = Tertiary Education Tax moderated by Firm Size

it = Bank and year

ϵ_{it} = Error term

This model allows for the estimation of the effect of Tertiary Education Tax on financial performance while moderating with firm size. The data collected is analysed using pooled regression model. Additionally, descriptive statistics and correlation analysis was used to provide an overview of the data that examined the relationships between the variables.

X. Data Analysis and Discussion of Findings

10.1 Descriptive Statistics

Table 2 displayed the descriptive statistics of the variables used for the study showing the mean, standard deviation, minimum and maximum values of the variables.

Table 2: Statistics of the Data used in the Study

Variables	Mean	Std Dev	Min	Max	Observation
ROA Overall	1.466982	3.109076	-24.10	6.5580	N=180
Between		1.81517	-1.55	4.94305	n=12
Within		2.574726	-21.09	7.250626	T=15
TET Overall	1662146	2982973	-67278.4	1.99e07	N=180
Between		1562655	-1682.24	4528266	n=12
Within		2578221	-2164420	1.77e+07	T=15
FIRMSIZE Overall	18.28228	1.073437	15.87672	21.24715	N=180
Between		.7983334	17.08321	19.40289	n=12
Within		.751518	15.17328	20.54371	T=15
TET_FIRMSIZE Overall	3.2500	6.1600	-1.1500	4.1600	N=180
Between		3.1400	-34058.8	9.0400	n=12
Within		5.3800	-4.4900	3.7300	T=15

Source: Author's Computation using Stata 17

Table 2 presents the descriptive statistics for the key variables used in the study: Return on

Assets (ROA), Tertiary Education Tax (TET), Firm Size (FIRMSIZE), and the interaction term



(TET_FIRMSIZE). These statistics provide insights into the central tendency, dispersion, and structure of the dataset covering a 15-year period (2009–2023) across 12 sampled deposit money banks (DMBs) in Nigeria.

The average Return on Assets (ROA) across the sample is 1.467%, indicating that, on average, the banks achieved a modest return on their assets during the period under review. The overall standard deviation of ROA is 3.109, suggesting significant variability in profitability across banks and over time. ROA values ranged from a minimum of -24.10%, indicative of substantial losses in some instances, to a maximum of 6.558%. The between standard deviation (1.815) shows moderate variability across different banks, while the within standard deviation (2.575) reveals notable fluctuations in profitability within banks over the years.

For Tertiary Education Tax (TET), the overall mean payment is approximately ₦1,662,146, but the standard deviation of ₦2,982,973 highlights a widespread in tax obligations among banks. The minimum TET recorded is a negative ₦67,278.4, suggesting possible tax refunds, overpayments, or accounting adjustments, while the maximum reached nearly ₦19.9 million. The between standard deviation (₦1,562,655) shows the extent of difference in average TET across banks, whereas the within

standard deviation (₦2,578,221) indicates considerable fluctuations within individual banks over the study period.

Firm Size records an overall mean of 18.282, reflecting the relatively large asset bases of the sampled banks. The standard deviation of 1.073 suggests a moderate level of variation in firm size across observations. Firm sizes range from 15.877 to 21.247, demonstrating the presence of both relatively smaller and significantly larger banks within the sample. The between and within standard deviations, 0.798 and 0.752 respectively, indicate that differences between banks were somewhat more prominent than fluctuations within each bank over time, as would be expected with firm growth trends being relatively stable annually.

The interaction term (TET_FIRMSIZE) has an overall mean of 3.250 and a relatively high standard deviation of 6.160, indicating substantial variation across the sample. The interaction values ranged from -1.150 to 4.160, which reflects possible negative interactions (especially where TET values were negative). The between standard deviation (3.140) and within standard deviation (5.380) further affirm that the moderating relationship between tertiary education tax and firm size varied significantly both across different banks and within individual banks over the 15-year period.

10.2 Correlation Matrix

Table 3: Correlation Matrix of the Variables used for the Study

	ROA	TET	FIRMSIZE	TET FIRMSIZE
ROA	1.0000			
TET		1.0000		
FIRMSIZE	0.4087	0.6700	1.0000	
TET FIRMSIZE	0.2712	0.9992	0.6628	1.0000

Source: Author's Computation using Stata 17

From table 3, ROA and FIRMSIZE have a Correlation of 0.4087. This indicated a moderate positive correlation. It suggests that as firm size increases, the return on assets also tends to increase likely because larger firms benefit from economies of scale, better access to capital, or more efficient tax strategies.

TET and FIRMSIZE have a Correlation of 0.6700. This is a strong positive correlation. It indicates that larger firms tend to pay more in tertiary education tax, which makes sense, as tax liabilities are generally tied to profitability and scale of operations.

TET and TET_FIRMSIZE have Correlation of 0.9992. This is an extremely high (almost perfect) positive correlation. It is expected,

because the interaction term (TET_FIRMSIZE) was constructed by multiplying TET × FIRMSIZE. High correlation between a variable and its interaction term is typical and not necessarily problematic, but it may raise multicollinearity concerns in regression analysis.

TET_FIRMSIZE and ROA have Correlation of 0.2712. This is a weak to moderate positive correlation. It suggests that the interaction between tertiary education tax and firm size has a positive but limited linear relationship with return on assets. This supports empirical that firm size may moderate the effect of TET on ROA.



10.3 Unit Root Test

The unit root test was conducted to test the stationarity of the variables used for the study using

the Im, Persaran and Shin (IPS). The results are presented in table 4.

Table 4: Panel Unit Root Test Result using Im, Persaran-Shin (IPS)

Variable	t-statistic @ level	P-value @level	Critical value	Order of Integration
LROA	t-bar = -3.3203 t-tlde-bar= -2.2923 z-t-tidle-bar= -4.4685	0.0000	1% = -2.740 5% = -2.570 10%= -2.470	I(0)
LFIRMSIZE	t-bar = -3.5193 t-tlde-bar= -2.3059 z-t-tidle-bar= -4.4101	0.0000	1% = -2.740 5% = -2.570 10%= -2.470	I(0)
LTET	t-bar = -3.4847 t-tlde-bar= -2.2043 z-t-tidle-bar= -3.9916	0.0002	1% = -2.740 5% = -2.570 10%= -2.470	I(0)
LTET_FIRMSIZE	t-bar = -3.4677 t-tlde-bar= -2.1966 z-t-tidle-bar= -3.9564	0.0002	1% = -2.740 5% = -2.570 10%= -2.470	I(0)

Source: Author's Computation using Stata 17

In table 4, Return on Assets (ROA), Firm Size (FIRMSIZE), Tertiary Education Tax (TET), and the interaction term (TET_FIRMSIZE) are all stationary at level, there is no unit root problem in the dataset. The p-values for all variables are 0.0000, which means they are statistically significant at the

1%, 5%, and 10% levels. Since all variables are stationary at level (I(0)), they do not require differencing to remove trends or non-stationarity. This means the variables can be used directly in regression models without transformation.

10.4 Model Estimation

Table 5: Results of Pooled Regression Without Moderation

Variable	Coefficient	Z-value	Prob Value
TET	0.9416088	0.0537916	0.000
FIRMSIZE	-17.575	1.405201	0.000

Source: Author's Computation using Stata 17 Version Prob>F = 0.0000 R² = 0.797

TET (Tertiary Education Tax) from table 5 has a positive relationship with ROA. This means that as TET increases, ROA also increases. Z-value (0.0538): A standard score showing how far the coefficient is from zero in standard error units though small, but statistically significant. TET has positively influenced ROA, and this effect is statistically significant.

FIRMSIZE has a strong negative relationship with ROA. Larger firms are associated with lower ROA

in this model. The Z-value (1.4052): Indicates statistical strength and a Prob value (0.000) indicated, highly significant. This implies that larger firm size seems to negatively impact ROA, and this effect is statistically significant. The Prob > F = 0.0000 indicates that the overall model is highly significant and can be used for prediction. TET and firm size together explain significant variance in ROA.

Table 6: Results of Pooled Regression with Moderation

Variable	Coefficient	Z-value	Prob Value
TET	-2.4408	-2.24	0.025
FIRMSIZE	-18.36378	12.69	0.000
TET_FIRMSIZE	0.9774269	18.22	0.000

Source: Author's Computation using Stata 17 Version Prob>F = 0.0000 R² = 0.797 Adjusted R² = 0.783

The R²

The variation in R-square values between the non-moderated and moderated regression models is quite substantial and has important

implications. In the non-moderated model, the R-square is 0.26, indicating that only 26% of the variation in return on assets (ROA) can be explained by the tertiary education tax (TET) and firm size



alone. This suggests a relatively limited explanatory power of the model when the interaction between variables is not considered.

However, once the moderating variable (firm size interacting with TET) is introduced in the second model, the R-square increased to 0.797. This implies that about 79.7% of the variation in ROA is now accounted for by the model. The significant increase in R-square (a 53.7 percentage point increase) demonstrates the substantial improvement in model fit when the moderating effect is included.

This variation underscores the critical role that firm size plays in shaping how tertiary education tax affects profitability. The improved explanatory power of the moderated model suggests that the relationship between taxation and firm performance is more complex and better captured when firm size is considered as a moderator.

10.5 Post-Estimation Diagnostic Tests

To ensure the robustness and validity of the pooled panel regression model, a series of post-estimation diagnostic tests were conducted. These tests help to verify the fundamental assumptions underlying the pooled panel regression model

10.5.1 Test for Heteroskedasticity

The Breusch-Pagan test was employed to assess the presence of heteroskedasticity in the residuals. The null hypothesis of this test posits that the error variances are constant across observations (homoskedasticity). A non-statistically significant test result 0.4352 indicates the absence of heteroskedasticity, suggesting that the assumption of constant variance is not violated.

10.5.2 Test for Serial Correlation

Serial correlation, or autocorrelation, is another critical concern, particularly in panel data where observations span across time. The Wooldridge test for autocorrelation in panel data was applied to detect the presence of first-order serial correlation. The probability chi2 value of 0.3452 indicated the absence of first-order serial correlation

10.5.3 Test for Cross-Sectional Dependence

Given the nature of the panel dataset, where multiple firms are observed over time, the possibility of cross-sectional dependence among residuals was also examined using the Pesaran CD test. The null hypothesis of this test is that residuals are cross-sectionally independent. A non-significant result of 0.0934 suggests that residuals across firms are not correlated.

10.6 Interpretation of Results

The regression results presented in Table 6 examine the moderating role of firm size on the relationship between tertiary education tax (TET) and return on assets (ROA) for listed deposit money banks in Nigeria. The analysis yields several notable insights.

Firstly, the coefficient of TET is negative and statistically significant ($\beta = -2.4408$, $p = 0.025$), indicating that tertiary education tax, in isolation, exerts a negative influence on banks' financial performance. This suggests that TET may impose a financial burden on banks, particularly those with limited capacity to absorb additional fiscal costs.

Secondly, firm size also demonstrates a negative and highly significant relationship with ROA ($\beta = -18.36378$, $p < 0.01$). This outcome implies that as banks grow in size, their efficiency and profitability tend to decline. This finding aligns with theories suggesting that larger firms may experience diminishing returns to scale, increased bureaucracy, or operational inefficiencies.

However, the interaction term (TET \times Firm Size) reveals a positive and statistically significant effect on ROA ($\beta = 0.9774$, $p < 0.01$). This suggests that firm size moderates the relationship between TET and ROA positively. In practical terms, this means that while TET alone may reduce bank profitability, its adverse effect is significantly mitigated in larger banks. These institutions likely possess greater managerial capabilities, technological infrastructure, and financial resources to strategically manage tax obligations in a way that can enhance returns, for instance, through talent development or institutional partnerships with tertiary institutions.

The variation in R-square values between the non-moderated and moderated regression models is quite substantial and has important implications. This variation underscores the critical role that firm size plays in shaping how tertiary education tax affects profitability. The improved explanatory power of the moderated model suggests that the relationship between taxation and firm performance is more complex and better captured when firm size is considered as a moderator.

The overall model is statistically significant (Prob > F = 0.0000), confirming the joint relevance of the independent variables in explaining variations in return on assets among listed banks in Nigeria.

XI. Discussion of Findings

The empirical findings from the moderated regression model provide important implications for tax policy, banking regulation, and institutional strategy in Nigeria's financial sector:



The negative main effect of TET indicates that the current uniform tax policy may unduly burden smaller banks. To address this, policymakers should consider tiered tax structures or relief incentives based on firm size or profitability. Such a framework would encourage compliance while minimizing the unintended consequence of eroding financial performance among less-resourced banks.

Given that firm size positively moderates the TET–ROA relationship, there is an opportunity to leverage this finding for broader economic benefits. Larger banks should be encouraged to view TET not merely as a statutory obligation but as a tool for enhancing institutional performance through strategic investments in human capital, training, and educational partnerships. Government policy could reinforce this approach by offering performance-based tax rebates or credits to banks that channel TET funds toward measurable outcomes in education or innovation.

Despite their ability to manage TET obligations more effectively, the negative coefficient associated with firm size suggests that larger banks still face performance challenges. Regulatory bodies such as the Central Bank of Nigeria (CBN) and the Nigeria Deposit Insurance Corporation (NDIC) should engage in periodic performance audits and operational reviews of large banks to identify areas for structural improvement. Emphasis should be placed on process optimization, digital innovation, and cost reduction to boost return on assets.

The significant role of TET in influencing financial performance necessitates greater transparency in how the tax is utilized. It is imperative that TET funds be allocated to targeted programs that support the banking and financial services sector, such as fintech education, risk management training, and leadership development in Nigerian tertiary institutions. Doing so ensures a value-aligned return on tax investments, benefiting both educational institutions and tax-contributing banks.

XII. Conclusion

The study examined the moderating effect of firm size on the relationship between tertiary education tax (TET) and the return on assets (ROA) of listed deposit money banks in Nigeria over the period 2009 to 2023. The findings revealed that TET alone negatively impacts ROA, suggesting that tertiary education tax imposes a financial burden on banks, reducing profitability. However, the interaction between firm size and TET was found to have a positive and significant influence on ROA,

indicating that larger banks are better equipped to manage the costs associated with TET, likely due to better resources, financial strategies, and operational efficiencies. Furthermore, firm size on its own had a significant negative effect on ROA, supporting the notion that larger institutions may experience diseconomies of scale if not properly managed. The substantial improvement in the explanatory power of the model after introducing the moderating variable underscores the importance of firm-specific characteristics in understanding the impact of taxation on bank performance. Overall, the study concludes that while tertiary education tax has an adverse effect on profitability, larger firm size can buffer and even reverse this negative impact, demonstrating the strategic advantage of scale in financial management.

XIII. Recommendation

Based on the findings, it is recommended that banks, particularly smaller and mid-sized banks, develop strategic frameworks to manage their tax obligations more efficiently. This can be done by setting up dedicated tax planning units within their finance departments to monitor and optimize tax exposures actively. Banks should also invest in building stronger financial management systems and human capacity that can negotiate and plan around statutory tax payments to minimize their negative impact on profitability. For larger banks, it is advisable to leverage their scale advantage more intentionally by pursuing partnerships with tertiary institutions, thus converting tax obligations into corporate social responsibility initiatives that can yield both reputational benefits and financial efficiencies. Furthermore, regulatory authorities, such as the Federal Inland Revenue Service (FIRS) and the Central Bank of Nigeria (CBN), should consider designing flexible tax incentives for banks that demonstrate active contributions to tertiary education development, thereby aligning tax payments with visible societal benefits and mitigating the perceived financial burden on institutions. Finally, banks of all sizes should routinely integrate firm size dynamics into their financial planning processes, recognizing that managing scale and operational efficiency is crucial not just for profitability but also for resilience against external fiscal pressures like the tertiary education tax.



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