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## **FIRM FINANCIAL ATTRIBUTES AND TAX PLANNING: EVIDENCE FROM LISTED CONSUMER GOODS COMPANIES IN NIGERIA**

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### **Abstract**

*This study examines the effect of firm financial attributes on tax planning among listed consumer goods companies in Nigeria. The study utilized a sample of 13 consumer goods companies for the period of 2013 to 2022. The study utilized secondary data from the financial reports of the sampled companies obtained from the Nigerian Exchange Group. A fixed effects regression has been employed in this study. The results from the study revealed that Profitability increases tax planning of listed consumer goods companies. However, Firm growth reduces the level of tax planning of the companies used in the study. Therefore, the study can be used by the policymakers or regulators in formulating policies on tax related issues in Nigeria.*

**Keywords:** Tax planning, Profitability, Liquidity, Leverage, and Firm growth

### **1. Introduction**

Taxation is considered as among the sources of government revenue. Tanko (2023) noted that tax is critical to governmental fiscal revenue. Tax planning by a firm includes legal tax planning and illegal tax evasion. Tax planning means reducing a firm's tax burden through investments and structuring business activities within the scope of the tax law (Tanko, 2023). It is equally a civic duty that individuals, as well as corporate entities, are expected to perform. For corporate entities, tax is one of the line items found in their financial statements and is a reduction in the distributable profit available to their shareholders who desire maximization of their wealth. Thus, Tanko (2023) asserted that because corporate taxes are a significant business cost that reduces distributable profit, there is a tendency for firms to avoid taxes. According to Musa et al. (2024) corporate tax planning seems to be an important issue as it relates to the financial management of enterprises, thereby affecting its sustainability, and the entire performance.

Tax payments inspire businesses to decide on tax management via instances like tax planning activities. which is considered as a form of legal practice to minimise the amount of tax to be paid to government. In developing economies, taxation is considered more critical for budget and revenues of a country. Tax planning is a crucial aspect for businesses and individuals to optimize their financial liabilities and maximize their economic benefits. It involves strategies and schemes to minimize tax burdens and effectively utilize funds for productive purposes. Tax planning activities is common across all corporations (Agyei et al., 2019) and Desai and Dharmapala (2009) argued that opportunistic managers employ tax planning strategies to advance managerial, rather than shareholders interest. Similarly, since tax laws are dynamic, corporate bodies may continue to witness changes on the taxable items and the amount to be paid to the tax authority and therefore, affecting their financial status. In a study on the association between financial constraints and cash tax savings, Edwards et al. (2015) argued that financial constraints may increase corporate tax planning activities. According to Jaffar et al. (2021) since tax is considered as a burden to companies, there exist greater probability for the companies to be engaged in planning their tax activities. Hence, tax planning seems to be a global phenomenon that requires more attention. Corporate bodies in Nigeria are not in isolation on tax planning activities. It was reported by premium times Nigeria in 2021 that the Nigerian government has accused Multichoice of ₦1.8 trillion tax fraud. The tax appeal tribunal ordered the company to pay ₦900 billion to the Federal Inland Revenue Service (FIRS). Therefore, the Nigerian government may have serious concern over tax planning activities since it will lower its expected revenue to be generated.

In general tax planning plays a significant role in balancing tax obligations and financial conditions for businesses and individuals, and it continues to be a topic of interest for researchers and practitioners. Researchers in the past have highlighted various some features that may result to tax planning activities, financial characteristics (Tanko 2023; Tanko et al., 2022; Agyei et al., 2019) corporate governance (Chytis et al., 2020; Armstrong et al., 2015) audit committee (Robinson et al., 2012)

Evidence on how firm financial attributes affects tax planning are not clear. The results can be summarized as being significantly positive, negative, or insignificant (Jaffar et al., 2021; Tanko et al., 2022; Tanko, 2023; Ribeiro, 2015; Jamei and Khedri; 2016; Yuniarwati et al., 2017; Salaudeen, 2017; Tilehnouei et al. 2018; Mahrani 2019; Hazir, 2019; Mohanadas et al., 2018). Thus, this inconsistency in the reported findings from the previous studies have become among the rationale behind conducting this research.

More so, while extant studies have explored tax planning strategies in various contexts, a dedicated study on the firm financial attributes affecting these strategies in Nigerian consumer goods companies is lacking. This study is set to fill this gap by investigating the impact of firms' financial attributes on tax planning. Hence, proving an opportunity to add to the body of literature.

## **2. Review of Empirical Studies and Hypotheses Development**

### **2.1 Profitability and Tax Planning**

Profitability is used to measure worth of business. Tanko (2023) investigated the effect of profitability on tax planning. The uses 58 listed manufacturing companies from 2012 to 2021. Furthermore, the study employs regression as a tool of analysis. The result of the study reveals that profitability has a significant effect on tax planning.

Ribeiro (2015) examined the determinants of ETR of some non-financial firms from London Stock Exchange using GLS. The study showed that ROA positively and significantly influences ETR. Also, Jamei and Khedri (2016) reported similar results that ROA and ETR are positively related. Similarly, Fatimah and Nurlaela (2018) revealed a positive association between profitability has and tax planning. Recently, Idris et al. (2024) in their study of non-financial firms listed on the NGX found a significant positive association between ROA and tax avoidance.

However, Yuniarwati et al. (2017), who analysed the factor that affect tax avoidance of Indonesia-listed firms, documented a negative significant relationship between ROA and tax avoidance. This evidence revealed that ROA motivates firms to plan their tax activities. More so, Salaudeen (2017) explored the effect of ROA on ETR in the financial services sector in Nigeria. The study found a negative and significant of ROA on ETR. And these prior studies (Pratama & Padjadjaran 2017; Tilehnouei et al., 2018; Putra et al., 2018; Mahrani, 2019) reported negative relationship between ROA and ETR. The evidence is in line with several other studies (for example, Maula et al., 2019; Umar et al., 2021). Therefore, the study hypothesized that:

*H<sub>01</sub>: Profitability has no significant effect on tax planning of listed consumer goods companies in Nigeria*

## **2.2 Firm Liquidity and Tax Planning**

Liquidity refers to the ease with which a firm's asset can be converted into cash. The study of Pettersson and Wu (2015) documented a positive relationship between liquidity and BTD. Adegbite and Bojuwon (2019), documented that liquidity has a significant and positive relationship with long-run ETR. Similarly, the study conducted by John et al. (2022) in the beverage sector of NGX, from 2010 to 2018 revealed that liquidity affects ETR significantly and positively. Mahrani (2019) and Kibiya and Bilyaminu (2019) did not find significant association between liquidity and ETR.

However, Olaniyi and Okerekeoti (2022) while examining the liquidity and tax aggressiveness of deposit money banks in Nigeria reported a negative and insignificant effect of liquidity on book tax difference. Ogbeide et al. (2022) documented a negative effect of liquidity on ETR in the cross-country study. Novita and Herliansyah (2019) evaluated the effect of CG mechanism, liquidity and company size on tax avoidance. the study found that liquidity has a negative effect on ETR. In line with the review, the study states its hypothesis in a null form:

*H<sub>02</sub>: Liquidity has no significant effect on tax planning of listed consumer goods companies in Nigeria*

## **2.3 Leverage and Tax Planning**

Leverage is the extent to which a firm has been financed by outside or external funds which are purely debt obligations. Didar et al. (2014) in their study revealed is a negative impact of firm leverage on book-tax. Similarly, Ribeiro (2015) who examined listed firm on LSE, England reported a negative relationship between Debt to equity and ETR. The findings of Ogbeide (2017) and Osebe et al. (2019) supported the evidence reported previously. That the relationship between debt to assets and ETR is negative and significant. Jamei and Khedri (2016) failed to document significant result though the relationship between the two variables is negative.

However, Pratama and Padjadjaran (2017) as well as Aghouei and Moradi (2015) found a positive relationship between debt to equity and ETR. Evidence from Indonesia as revealed by Oktaviyani and Munandar (2017) indicated that equity debt ratio has a positive relationship with ETR. Other study like Bayunanda et al. (2018), Alfina et al. (2018) and Hariani and Waluyo (2019) indicated that debt to Equity positively affect ETR. Yahaya and Yusuf (2020) also supported these findings using data from the insurance firms. These results did not align with Idris et al. (2024) who reported positive but insignificant association between firm leverage and tax avoidance. Therefore, the study hypothesized that:

*H<sub>03</sub>: Leverage has no significant effect on tax planning of listed consumer goods companies*

## **2.4 Firm Growth and Tax Planning**

Firm growth is an important variable that has to do with various corporate operations (Mgammal, 2020) and Rapidly growing firms require more working capital to finance increasing in current assets as well as operational expenses (Idris et al., 2025). Abbas et al. (2018) examined effect of company life cycle on corporate tax avoidance from Pakistan using non-financial companies. The data were obtained from 100 companies from 2008–2015. The study indicated that the sample firms have lower probability of partaking in tax planning in both growth and maturity cycles. In another evidence from Nigeria, Kibiya and Bilyaminu (2019), reported a negative relationship between firm growth and ETR. Equally, Oktaviyani and Munandar (2017) documented a negative relationship between sales growth and tax avoidance (ETR) in Indonesia.

However, in Nigeria, Siyanbola (2022), tested the influence corporate attributes on the practice of tax aggressiveness. The result indicated that growth positively and significantly influences tax aggressiveness. Based on the review, the study hypothesized that:

*H<sub>04</sub>: Firm growth has no significant effect on tax planning of listed consumer goods companies*

## **2.5 Underpinning Theory**

This section explains the theory that is used to investigate the relationship between firm financial attributes and tax planning.

### **2.5.1 Agency Theory**

According to Jensen and Meckling (1976) agency theory is a relationship based on a contract between the principal as the authorizer and the agent who is the authorized party. Shareholders who are principals provide business decision making to managers who are representatives (agents) of the shareholders.

In agency theory, management action is considered exclusively for reducing the taxes by setting tax aggressive activities that are becoming common in all firms worldwide (Boussaidi & Hamed, 2015). Lanis and Richardson (2011) concluded that taxes act as the motivational factor for managers making decisions. There is a possibility that the companies' aggressiveness in tax avoidance may necessarily not be consistent with the desire of shareholders of a firm, which represent a discrepancy among the wishes of the shareholder with the behaviour of management which is commonly known as agency theory.

According to Hoseini et al. (2019), agency theory clarifies the relationship between the owner of a company and the management of the company. Management act as an agent that is appointed by the shareholder. The management is given the jobs, task, and authority for managing the firm, and it does it under the supervision of the shareholders (Herrera-Cano & Gonzalez-Perez, 2019). In practice, the principals desire to pay taxes through the management in their actual amounts, while the management want to minimize the tax expenses for obtaining higher profit. Although, there are times when the interest of the management and shareholders are the same. In this way, the things that boost tax avoidance can also be generated (Hoseini et al, 2019). Hence, based on the above argument, agency theory can be used to explain tax planning.

### **3. Method and Model**

This section presents the methodology The population of this study consists of all consumer goods companies listed on the Nigeria Exchange Group (NGX) as at 2024. The total population of these companies is (20) twenty. As at 31<sup>st</sup> March 2024, there are twenty (20) listed consumer goods companies on the floor of the Nigerian Exchange Group and represent the population of the study. The study uses purposive sampling. That a company is selected if it has complete information required for the analysis. For example, the company is listed within the study period and has complete annual reports. Based on these criteria, thirteen (13) companies where selected. Hence, thirteen (13) companies formed the sample size of the study. The main source of data for this study is the Nigerian Exchange Group. The study uses secondary data. The data were extracted from the financial statements of the listed consumer goods companies under review. The financial statements of the selected companies were obtained from the Nigerian Exchange Group. This study uses regression as a tool of data analysis. this is because the study examines the relationship between dependent and independent variables.

**Table 1:** Measurement of Variables

<b>Name</b>	<b>Acronym</b>	<b>Measurement</b>	<b>Citations</b>
<b>Tax planning</b>	TXP	Total tax expenses divided by profit before tax.	(Chytis et al., 2020; Yumiarsih, 2018; Idris et al., 2024)
<b>Profitability</b>	PRF	Net profit before tax/total asset	(Tanko et al., 2022; Kismanah et al., 2018; Idris et al., 2024)
<b>Liquidity</b>	LQD	Current asset divided current liabilities	(Chytis et al., 2020; Kibiya and Bilyaminu, 2019; Chen et al., 2019)
<b>Leverage</b>	LVG	Measure by total debts divided by total asset	(Jamei & Khedri, 2016; Putra et al., 2018; Chytis et al., 2020)
<b>Firm growth</b>	FMG	Current sales less previous sales divided by previous sales	(Robinson et al., 2012; Idris et al., 2025)

<b>Firm age</b>	FGA	Age of the firms from the date of listing	(Sheidu et al., 2023; Idris et al., 2024)
<b>Firm size</b>	FMS	Measured as log of total assets.	(Tanko,2023; Chytis et al., 2020; Musa et al., 2024)

Corporate tax planning and corporate tax disclosure

### 3.1 Model of the Study

The model of the study is specified to examine the relationship between tax planning and firm financial attributes. The regression model is stated below.

$$TXP = \alpha_{1it} + \beta_1 PRF_{it} + \beta_2 LQD_{it} + \beta_3 LVG_{it} + \beta_4 FMG_{it} + \beta_5 FMA_{it} + \beta_6 FMS_{it} + e_{it}$$

Where:

TXP= Tax planning

PRF=Profitability

LQD=Liquidity

LVG=Leverage

FMG=Firm growth

FMA=Firm age

FMS=Firm size

## 4. Results and Discussion

This section offers the results and discussion. It includes descriptive analysis correlation matrix, and the main regression result.

### 4.1 Descriptive Statistics

The descriptive statistics are presented in Table 2 where the minimum values, maximum values, standard deviation, skewness and kurtosis of the variable used in the study are shown.

**Table 2:** Summary Statistics

Variable	Mean	Std Dev	Min	Max	OBS
<b>TXP</b>	0.2418979	0.6891733	-3.601856	6.020575	130
<b>PRF</b>	0.1016738	0.1076452	-0.1797289	0.7195275	130
<b>LGD</b>	1.073413	0.5367486	0.0351511	2.880813	130
<b>LVG</b>	0.23045	0.2792577	0	2.12485	130
<b>FMG</b>	0.0566025	0.2593249	-0.9070157	.9429847	130
<b>FMA</b>	36.15385	11.66209	3	57	130
<b>FMS</b>	7.789441	0.6081222	6.229845	8.820048	130

**Stata output 2024.** Note: TXP=Tax planning, PRF=Profitability, LQD=Liquidity, LVG =Leverage, FMG=Firm growth, FMA=Firm Age, FMS=Firm Size.

### 4.2 Correlation Analysis

Table 3 below shows the correlation between the dependent and the independent variables as well as the relationship between the independent variables themselves. The values are obtained from the Pearson correlation of two-tailed significance. It shows the coefficient of the variables used in the study.

**Table 3:** Correlation Matrix

	<b>TXP</b>	<b>PRF</b>	<b>LQD</b>	<b>LVG</b>	<b>FMG</b>	<b>FMA</b>	<b>FMS</b>
<b>TXP</b>	1.000						
<b>PRF</b>	-0.0202	1.000					
<b>LQD</b>	0.1057	0.1507	1.000				
<b>LVG</b>	-0.1947	-0.0156	-0.1008	1.000			
<b>FMG</b>	0.1360	0.0454	-0.0089	-0.0731	1.000		
<b>FMA</b>	-0.0286	-0.0139	0.2753	-0.2594	-0.0836	1.000	
<b>FMS</b>	-0.1287	0.0133	-0.2921	-0.0418	-0.0598	0.1594	1.000

Stata output 2024. Note: TXP=Tax planning, PRF=Profitability, LQD=Liquidity, LVG =Leverage, FMG=Firm growth, FMA=Firm Age, FMS=Firm Size.

Table 3 shows that PRF has a negative correlation with TXP. The negative correlation coefficient of -0.0202, -0.1947, -0.0286 and -0.1287 between independent variable (PRF, LVG, FMA, and FMS) and tax planning indicate that as these variables decrease, the level of tax planning practices among the listed consumer goods firms in Nigeria.

### 4.3 VIF and Tolerance Test for Multicollinearity

Meanwhile, the positive correlation coefficients between tax TXP and LQD (0.1057) and FMG (0.1360) suggest that high liquidity and firm growth may have slightly higher levels of tax planning practices of listed consumer goods firms in Nigeria.

**Table 4:** VIF and Tolerance test for Multicollinearity

<b>Variable</b>	<b>VIF</b>	<b>TOLERANCE</b>
<b>PRF</b>	1.01	0.965767
<b>LQD</b>	1.29	0.777040
<b>LVG</b>	1.11	0.902975
<b>FMG</b>	1.05	0.956472
<b>FMA</b>	1.26	0.792100
<b>FMS</b>	1.19	0.838751

Source: STATA Output

Nevertheless, to determine the presence of Collinearity, a Variance Inflation Factor (VIF) Tolerance test was carried out, the result is reported in Table 4.3 of which provided evidence of the absence of Collinearity. This is because the results of the VIF test ranges from a minimum of 1.01 to a maximum of 1.29, which suggests absence of Multicollinearity in the model.

### 4.4 Regression Results

This section presents the regression result of the dependent variable (TXP), the independent variables of the study (PRF, LQD, LVG, and FMG) and control variables (FMA, and FMS). Furthermore, to determine the efficient model to be used for the analysis, Hausman test was used. This allows the comparison between random effect models with fixed effect model. The outcome of the Hausman test showed a Chi square of 3.67 and P-value of 0.0023 indicating that fixed effect model is the most appropriate. Hence, the regression result of this study is based on fixed effect estimation. The overall result is presented in Table 5. It revealed that the variables used account for 0.16.57% of variations in TXP, while 85% is explained by other factors. This is explained by the within R<sup>2</sup> of 0.1657.

This study employs regression analysis as a statistical technique to test the effect of financial attributes on tax planning activities on listed listed consumer goods companies. The dependent variable is Tax planning (TXP) and the independent variables are Profitability (PFR), liquidity (LQD), leverage (LVG) and firm growth (FMG). Furthermore, firm age (FMA) and size (FMS) are used as control variables. Table 5 shows the results from the estimation which favours fixed effects model.

**Table 5: Main Regression Results (Fixed Effects Model)**

VAR	Coef.	Std. Err.	T	P>t
PRF	-2.856	0.956	-2.990	0.003
LQD	0.243	0.159	1.520	0.130
LVG	-0.292	0.275	-1.060	0.290
FMG	0.519	0.236	2.200	0.030
FMA	0.022	0.029	0.740	0.459
FMS	-1.121	0.398	-2.820	0.006
_CON	8.243	2.547	3.240	0.002
<b>R<sup>2</sup> within</b>	0.16.57			
<b>F stat</b>	3.67			
<b>Prob</b>	0.0023			

Source: STATA Output

#### 4.4.1 Tax Planning and Profitability

Hypothesis 1 states that profitability has no significant effect on tax planning of listed consumer goods companies. The results presented in Table 5 show that the coefficient of PRF is negative and statistically significant at one percent significance level ( $\beta = -2.856$ ;  $t$ -statistics =  $-2.990$ ;  $p < 0.003$ ). This shows that on average, an increase in the profit of the sampled companies by one unit will result to a corresponding decrease in tax planning by 2856. Therefore, this provides evidence of accepting the alternative hypothesis, thus, Hypothesis one is rejected. Thus, the result is in line with Yuniarwati et al. (2017) and Salaudeen (2017) from Indonesian and Nigerian markets respectively. However, the result failed to agree with Tanko (2023) who investigated the effect of profitability on tax planning and found positive association.

#### 4.4.2 Tax Planning and Liquidity

The study hypothesized that liquidity has no significant effect on tax planning of listed consumer goods companies. From Table 5, the results indicate that liquidity has a positive coefficient and statistically insignificant ( $\beta = 0.243$ ;  $t$ -statistics =  $1.520$ ;  $p < 0.130$ ). Therefore, this provides evidence of accepting the null hypothesis. This shows that liquidity does influence the tax planning activities of the sampled companies. Therefore, the result agrees with prior studies (Mahrani, 2019; Kibiya & Bilyaminu, 2019).

#### 4.4.3 Tax Planning and Leverage

Table 5 shows the result of tax planning and leverage of listed consumer goods company in Nigeria. The coefficient of LVG is negative and statistically insignificant at ( $\beta = 0.292$ ;  $t$ -statistics =  $1.060$ ;  $p < 0.290$ ). This shows that leverage liquidity does not affect tax planning activities of the sampled companies. Consequently, this provides evidence of accepting the null hypothesis three. Further, the result is in agreement with prior studies (Tilehnoei et al., 2018; Didar et al., 2014; Jamei & Khedri, 2016).

#### 4.4.4 Tax Planning and Firm growth

Table 5 shows the result of tax planning and firm growth of listed consumer goods company in Nigeria. The coefficient of FMG is positive and statistically significant at five percent significance level ( $\beta = 0.519$ ; t-statistics= 2.200;  $p < 0.030$ ). This shows that on average, an increase in the profit of the sampled companies by one unit will lead to a corresponding increase in tax planning by 0.519. Based on this outcome, it provides evidence of accepting the alternative hypothesis, thus, hypothesis four is rejected. Hence, the result is in line with previous literature of Jong et al. (2017) and Mangoting et al. (2019).

#### 5. Conclusion

The study examines how firm financial attributes that include profitability, liquidity, leverage and firm growth affect tax planning practices in the listed consumer good companies in Nigeria. From the documented evidence, the study shows that among other things, profitability and firm growth have important implications on taxation.

#### Recommendations

Based on the findings and conclusions, the study has the following recommendations:

- i. Listed consumer goods companies should carefully analyse their tax planning activities as this may have adverse effect on the returns of shareholders.
- ii. On firm growth, the sampled companies used in this study should continue to explore available avenues in the tax planning with a view of reducing legally their tax liabilities. This will enhance their growth and allow them to have more viable investments that may add more value to shareholders.

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## **EFFECT OF AUDIT QUALITY ON FIRM VALUE OF LISTED DEPOSIT MONEY BANKS IN NIGERIA: FURTHER EVIDENCE**

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### **Abstract**

*This study analyses the effect of audit quality on firm value of listed deposit money banks in Nigeria, whereby the elements of audit tenure and auditor independence are discussed and used as explanatory variables. Based on ex post facto research design, the research examined archival data of 14 deposit money banks that are listed on the Nigerian exchange group between 2015 and 2024 through census sampling technique. Using pooled ordinary least squares (OLS) regression we ran the robust standard errors. The findings indicate that greater length of audit tenures has an immense positive effect and greater auditor independence also has immense positive effect explaining together 45 percent of the variance in firm valuations. This implies that there is the need of long-term auditor and client relationships, and effective independence protection as an important source for market confidence and shareholder value in the banking industry in Nigeria. The study suggested that regulators and bank audit committees should support the best practices tenure (e.g. five to seven years) and enhance the independence policies, including partner rotation in order to facilitate firm value and ensure sustainable growth.*

**Keywords:** Firm value, audit quality, audit tenure, auditor's independence

### **1. Introduction**

The audit quality is a determinant confidence of the firm value since it enhances the dependence of corporate revelations and decreases asymmetry of information amid the corporate management and the investors. Deposit money banks are very essential to the resource mobilization and economic growth, when it comes to the most prosperous banking sector in Nigeria, the visibility in a money reporting form is the only means left to make sure the players and the market, as well as the investors stay confident (Central Bank of Nigeria [CBN], 2020). Firm value here is the estimation of market friendly future growth against the cost of substitute of assets and can be helpful in marking future correlation of auditor counter action work and investors understand point of view (Brown & Green, 2016; Oladele, 2024).

One of the aspects of audit quality is audit tenure, which implies a timeframe within an on-going association between an auditor and client and is a surrogate measure of

the conflict of interests relating to the advantage of seeking advice on the one hand, and on the other hand, an adverse effect of lower level of audit professional skepticism of firm specific expertise (Alzeban & Sawan, 2015; Smith & Jones, 2015). These are long standing experiences that may improve efficiency of auditing and perceptions of complexities of banking business. Yet, regulators tend to place restriction on the tenure to ensure there is objectivity in auditing. The independence of the auditors reinforces the quality of an audit and the lack of inappropriate influence of facts or even the perception of the auditors to render their judgment because of it directly links to stakeholder confidence in the audited financial statement (Beattie et al., 2019). Because there are financial instruments and the regulation part of the business is highly complicated in the banking industry, the greater the independence protection such as rotation of partners and constraint on non-audit relationships that exists, the greater will be the perceived believability of the financial disclosure, and thus, the greater will be the firm value.

The presence of economies of scale and portfolio diversification in larger banks levels may influence not only the industry audits but also the longer-term assessment of the banks as an opportunity area in the market (Adebayo, 2018; Sani & Bello, 2022). It is to be realized that any perceived relationship amid audit tenure along with the auditor independence in addition to the level of firm value is not confound together with the bank scale. Despite the voluminous sizes of literature and research conducted on audit quality and its impact on financial performance and vice-versa little literature and research have been able to take into consideration, audit tenure, auditor independence and their implication on firm value in the group of Nigerian listed deposit money banks. This is the essence of what this study captures with the question being how the audit quality attributes impact the market valuations to provide practical information to the regulators, auditors and the bank management to maximize audit structures and the value of the shareholders.

Despite the various studies conducted on individual audit-quality components and the various performance of the Nigerian banks most of the studies differentiate as to whether the individual audit-quality components and performance outcomes affect anything collectively to the firm value. Adegbe and Fakile (2016) took into consideration the problem of the auditor independence and the profitability of the bank, but the concern of Musa and Akinbode (2021) was an issue of the audit tenure and financial stability. To the same end, Ettredge et al. (2014) investigated the impact of non-audit fee influence on the audit objectivity, whereas the significance of the independence of auditor described by Beattie et al. (2019) showed the need to advance the credibility of reporting. The absence of congruent studies in determining the impacts of audit tenure and auditor independence on firm value denies the investors and regulators the super comprehensive feed on which audit activities affect the valuations of firms in listed deposit money banks in Nigeria the most.

Some of the other global studies done that find that these audit quality characteristics impact the market-based measures of performance are Smith and Jones (2015) in the U.S., Brown and Green (2016) in the U.K., and Chen and Lee (2018) in China. Nevertheless, since the regulatory regimes, market systems, and the operations within the banking sector cannot be identical, their outcomes may not be directly transferable to Nigeria. Besides this, the banks are observable to have scale economy that influences the audit engagements as well as the expectations in the market. These research gaps are addressed in the present research study in measuring the combined

effects of audit tenure and auditor independence on the firm value of listed deposit money banks in Nigeria.

This study aims at providing the effect of audit quality on the values of the listed deposit money banks in Nigeria as the primary objective. The specific objectives of the study are to:

- i. determine the effect of Audit Tenure (AUDTN) on firm value of listed deposit money banks in Nigeria.
- ii. examine the effect of Auditor Independence (AUDIND) on firm value of listed deposit money banks in Nigeria.

The current research addresses the study gap by providing a multidimensional treatment of audit quality in the banking sector in Nigeria, which is a significant contributor to the Nigerian economy. Its findings will enable the administration of the bank to modify their engagement policies of audits to enhance financial gains and corporate governance. Along with this, regulators and policy makers will be able to base their decisions on the findings and employ these to formulate policies to maximize the quality of auditing so as to ensure investor confidence is strengthened and that the growth of the Nigeria financial system is ensured in the long run.

## **2. Literature Review**

### **2.1 Conceptual Review**

#### **2.1.1 Audit Quality**

Audit quality is a measure of likelihood of the auditor to inform about a material misstatement in the financial statement of a firm and have a capacity to report on it, and therefore, reduce information risk by the users of financial statement (DeFond & Zhang, 2014; Alzeban & Sawan, 2015). It is often operationalized with those easily observable characteristics of the audit-firm, such as the size, tenure, the amount of fees on non-audit activities and the appearance of any independence, since they are the proxies of the rigor and objectivity of the audit process (Alzeban & Sawan, 2015). High audit quality is also explained as professional competence of the auditor and the close following of ethical and technical standards and the compatibility of the entire audit procedures that make it credible and reliable of financial reporting (Beattie et al., 2019). The stakeholders make economic decisions depending on the quality of the audit and the high-audit quality builds great confidence to the investors, regulators, and other players in the capital market in general (Beattie et al., 2019).

##### **2.1.1.1 Audit Tenure**

This term of audit tenure is applied to indicate the length of the existing client relationship between an audit firm and its client and is usually computed in years on the initial appointment till the present audit period (Alzeban & Sawan, 2015). The period also indicates the amount of knowledge developed by the auditors about the business activity of a certain client and system of financial statements, as well as existing threats associated with the loss of professional skepticism due to excessive familiarity with the activity of the client (Smith & Jones, 2015). In practice, there is

also audit tenure which is used to balance the benefits of familiarity with the clients as a client including improved audit productivity and knowledge of the risks in the industry with the risk of length of engagement of an auditor leading to auditor complacency and loss of independence problem (Musa & Akinbode, 2021). The laws and regulation are inclined to formulate tenure standards or restrictions to safeguard the impartiality of audit and assure the trustworthiness of financial accounts to all the stakeholders.

#### **2.1.1.2 Auditor's Independence**

The independence of the auditor is described as independence in attitude as an auditor can have unbiased and objective attitude towards audit engagement and to be free of financial and endearing and organizational influences which can undermine the professional judgment (Beattie et al., 2019). Independence exceeds independence indeed, which is the very state of mind impartiality by the auditor, and independence in appearances, or an inculcation of an attitude of objectivity and the lack of conflict of interest on the sides of the audit process in the mind of the observer (Alzeban & Sawan, 2015). The issue of independency of the auditor is a major concern to the integrity of the financial reporting, since it is anchored on the latter thus making the stakeholders to have confidence on the opinion of the auditor. Some of the common actions in assuring independence, as well as enhancing the reliability of financial statements being audited, are the prohibition of non-audit services to audit clients, partner rotation and adherence to strict codes of ethics (Adegbie & Fakile, 2016; Beattie et al., 2019).

#### **2.1.2 Concept of Firm Value**

The market of the firm value is an assessment of the firm value which is a blend of present value of the projected future stream of cash flows to all providers of funds not alone the equity investors but the debt holders as well (Brown & Green, 2016). It collects all the expectations of the investors on the expected growth of a business, its risk status and the asset usage of the company (Oladele, 2024). This is the fact that it is an inclusive term comprising policy performance, quality of governance that is verified, and the market sentiment all in one, and this is the metric or measurement the parties that are interested use in making the investment decisions (Sani & Bello, 2022). It is a forward oriented pointer, sensitive to strategic actions, risk management and those of the external economy. The remarkable value of firms suggests that there is investor belief in the possibility of a firm to effectively anchor its returns that are sustainable and the low value of a firm can be associated with the ineffective employ of the management or growth (Adebayo, 2018).

## **2.2 Theoretical Framework**

The theoretical basis under which this theory has been postulated is the Agency Theory and it was initially propounded by Jensen and Meckling in 1976. The Agency Theory outlines the principal agent issues where enterprise business ( recognized as the principals ) gives the rights to manage which entail controlling rights to an enterprise business that is conveyed through the managers (recognized as the agents). Asymmetry of information and a conflict of interest can be caused by relations between these parties (Jensen & Meckling, 1976). External audit may be viewed as a mechanism of governance, a monitor of reporting by managers, in relation to the minimizing the agency price, in that way external audit ensures the stakeholders that the financial statements should provide the degree of performance which is in line with the performance of the bank (DeFond & Zhang, 2014).

The selection of the Agency Theory is particularly relevant to discuss listed deposit money banks in Nigeria because they find themselves in a versatile regulatory environment and economic environment where the information asymmetry can be very strong. High quality of audit is reinforced by monitoring, which is boosted by the issues, such as the independence of the auditors, the size, the tenure, and the non-audit fees (Beattie et al., 2019). These measures help to coordinate the activity of managers and shareholders' interests as a consequence of which the misstatement of the earnings is reduced (Beattie et al., 2019). In this way, the Agency Theory provides a rather compelling argument to examine the influence that audit-quality dimensions make on the value of firms because of sensitivity of audit in the process of creating trust among investors and in assuring good corporate governance.

## **2.3 Empirical Review**

Adegbie and Fakile (2025) investigated how the size of the audit firms influences the ROA, and the ROE of the listed deposit money banks in Nigeria. The survey strategy they designed was descriptive whereby they sampled all the 14 banks that are listed in the Nigerian Exchange Group in the period 2018-2023. There was a stratified random sample in which a final list was selected of 10 banks. The data was obtained through administration of standardized questionnaires to chief financial officers and audit partners; and annual reports formed the secondary data. Concurrent fixed/random effect regression of a panel of data was completed. They found that the involvement of big four firms (audit in particular) show significant relationship with ROA and ROE on a positive trend. It was established that the larger audit firms are more assuring and hence the regulators should encourage the banks to engage with globalized audit firms.

Johnson and Li (2024) investigated the impact of audit tenure on cost management efficiency of commercial banks in Ghana between the year 2015 and 2022. A population of 22 banks was derived based on a correlational research design that was assumed. Purposive sampling was used to get one hundred and fifty banks; those that had constantly made use of the services of audit companies over a span of five years and more. Secondary data was collected using audited financial statements in the form of tenure of auditors and cost to income ratios collected. The analysis between tenure and efficiency was done by the means of hierarchical linear modeling. The authors reported that the ideal tenure 4-7 years because of the optimal region of tenure expense management as too long tenures beyond eight years do not pay off anymore. They concluded that legal limit on tenure can be employed to tradeoff familiarity advantage

against independence hazards and should make partner rotation mandatory after every 7 years.

Oladele and Onwumere (2023) addressed the issue of the impact of non-audit fees on market-book ratios of listed deposit money banks in Nigeria in the years 2016 to 2021. They applied ex post facto design in which all the 12 banks were incorporated and relevant data were at disposal. They were unable to simply rely on simple random sampling since through census is the way in which the researchers used to conduct the investigation. Secondary data published on annual reports entailed the non-audit and audit fees and the market valuations. The issue of endogeneity was solved with the assistance of two-stage analysis of the least squares (2SLS) analysis. The findings indicated a positive, but non-proportional relationship: the non-audit fees increase auditor preoccupation and the level of the market to a certain threshold, beyond this threshold the declination of independence diminishes the quotations. They recommended a simple articulation of thresholds where there are non-audit engagements.

In dealing with audit independence and its effects on quality earnings in Chinese-owned state banks between the years 2014 and 2019, Chen and Patel (2022) exploited the New Zealand context. They employed cross sectional study of 30 banks and cluster sampling was employed to have cross-sectional representation. The data with a relation to auditor independence rating (on the basis of independence questionnaires) and discretionary accruals as an indicator of the quality of earnings were gathered based on the interviews which included structured ones and analysis of the reports. The multiple regression test indicated that great independence of Auditors is one of the critical determining factors that fall in the bracket of a reduction of earnings management. In this research, it was found that more stringent independent protective remedies (e.g. partner rotations) should be implemented in order to protect the informal sector against the risks of informality and it was recommended that the China Banking Regulatory Commission should come up with stricter independence requirements to find a solution to this issue.

Olowookere et al. (2021) conducted an empirical investigation into the effects of audit committee diversity on financial reporting quality among listed consumer goods companies in Nigeria, emphasizing how audit committee composition and expertise influence the credibility and transparency of corporate reports. Using a panel dataset covering several years of financial statements, the study applied multiple regression analysis to examine relationships between audit committee characteristics, such as gender diversity, financial expertise, and independence, and key indicators of financial reporting quality. The findings revealed that audit committee competence and independence significantly and positively affect financial reporting quality, while gender diversity had an insignificant effect. This suggests that committees with members possessing strong financial and accounting knowledge are more effective at overseeing management and ensuring compliance with regulatory standards, thereby enhancing corporate accountability. The study's results align with the agency theory, which posits that effective monitoring mechanisms reduce information asymmetry between managers and shareholders. The study contributed to the literature by demonstrating that improving audit committee composition can strengthen governance and boost investors' confidence in financial disclosures, offering insights relevant for both regulators and corporate boards in Nigeria's evolving financial landscape.

Brown and Green (2020) have examined the relation of listed UK banks to auditor affiliation with network global (Big 4 / non-Big 4) and Tobins Q in 2010-2018. The 16 banks that were selected were broken down as 12 being sampled with the help of a systematic sampling due to continuous listing. The secondary data of the affiliation of auditors and the market valuation indicators was accessed through company filing. The size and leverage of banks were considered in panel GLS regression. The findings showed that banks under the Big 4 were highly audited and had high Tobin Q meaning that they were highly trusted by investors. Instead, they established that audit quality is correlated with the fact that the firm is affiliated with a network and they advised bank boards to consider this network influence in the choice of an auditor.

Njoroge and Otieno (2019) assessed the worth of the auditor tenure and non-performing loan (NPL) ratios of the Kenyan commercial banks of 2012-2016. The research covered ten banks, with a descriptive research design that was used and 7 banks were selected as the sample because they had fixed audit arrangements. The secondary data on ratio of NPL and tenure ratio was taken on central bank reports. The Pearson correlation/regression analysis presented a picture in which the optimum tenures (5-6 years are optimum) to minimize the NPL ratios. They made a conclusion that tenure management can help support asset quality and proposed tenure guidelines when regulating the banks.

The research that was developed by Ojo and Ehioghae (2018) was formed under the basis of the relationship between non-audit services and the independent perception of auditors towards the manager of deposit money banks in Nigeria, between 2010 and 2015. The survey was done with a view to recovering the answers of 120 managers of the finance departments; 80 of answers obtained through a simple random sampling. The various information was collected using survey tools that were administered on perceived independence in the Likert scales and non-audit fee ratios which were reported in the banks. Application of factor analysis and structural equation modeling (SEM) revealed that the perceived independence is crushed by non-audit services that are beyond the reasonable limit. The authors concluded that there is need to diversify fees in balance, they recommended commission cap on non-audit engagements.

### **3. Method**

#### **3.1 Research Design**

The study adopted an ex post facto research design, which is appropriate when the key explanatory variables, audit tenure and auditor independence, cannot be manipulated and must be observed as they naturally occur. By analyzing historical audit-quality measures and subsequent firm value of listed deposit money banks in Nigeria, this design enables examination of the relationships between past audit practices and later market valuations without researcher intervention, while statistical controls help isolate the combined effects of these audit-quality dimensions.

The population comprised of all the fourteen (14) deposit money banks that are listed on the Nigerian Exchange (NGX) as at 2024. These banks are listed in Table 3.1, together with their listing date:

**Table 3.1: Listed Deposit-Money Banks**

S/N	Bank	Listing Year
1	Access Bank Plc.	1998
2	ECO Bank Transnational Incorporated	2006
3	Citi Bank Nigeria	1984
4	First Bank of Nigeria Plc	1971
5	FCMB Group Plc	2004
6	Fidelity Bank Plc	2005
7	Guaranty Trust Bank	1996
8	Stanbic IBTC Holdings Plc.	2012
9	Sterling Bank Plc	1993
10	Union Bank	2005
11	United Bank for Africa	1970
12	Unity Bank	2005
13	WEMA Bank Plc	1990
14	Zenith Bank Plc	2004

Source: NGX website, 2024

The study uses census sampling method, whereby it considers all the banks as population instead of choosing a sample. Census sampling eradicates the sampling error and utilises a possible span of an analysis of the whole array of audit committee configurations and the results of reporting. The secondary sources used to collect archival data are the corporate governance disclosures and the financial statements at the annual report of individual banks through the NGX archive and individual investor relations portals.

### 3.2 Methods of Data Collection

Data for this study are based on the annual reports and accounts of 2015 to 2024 of the listed deposit money banks in Nigeria contained in the archives of NGX. This is in lieu of the fact that a census sampling method would be appropriate in this study, and the entire number of the listed deposit money banks in Nigeria incorporated in the Nigerian Exchange Group (NGX). The analysis of each of the deposit money banks in the study can provide a full representation of how audit quality influences the banking sector in NGX.

### 3.3 Model Specifications

A similar pooled-panel regression model examining the relationship between audit quality dimensions and firm value was adapted from Olayinka and Olayiwola (2019), who investigated the effect of auditor independence and tenure on firm performance among listed firms in Nigeria. In their study, the model was specified as:

$$\text{FirmValue}_{it} = \alpha + \beta_1 \text{AUDTN}_{it} + \beta_2 \text{AUDIND}_{it} + \varepsilon_{it}$$

Where:

$\text{FirmValue}_{it}$  = Firm value of bank  $i$  at time  $t$  (market valuation metric)

$\text{AUDTN}_{it}$  = Audit tenure (years) of bank  $i$  at time  $t$

$AUDIND_{nt}$  = Auditor independence score (e.g., inverse non-audit fee ratio) for bank  $i$  at time  $t$

$\alpha$  = Constant term

$\beta_1$ – $\beta_2$  = Coefficients to be estimated for each audit-quality variable

$\varepsilon_{nt}$  = Error term capturing idiosyncratic shocks to firm value

Estimation uses pooled Ordinary Least Squares on panel data spanning 2015–2024, with robust standard errors to correct for heteroskedasticity and serial correlation.

### 3.4 Methods of Data Analysis

This analysis was conducted by coding data in Excel and importing it into STATA, where descriptive statistics and correlation matrices were used to examine variable distributions and interrelationships. Diagnostic tests were employed to ensure model validity, including the Variance Inflation Factor (VIF) for multicollinearity, the Breusch–Pagan test for heteroskedasticity, and the Wooldridge test for autocorrelation. The effects of audit tenure, non-audit fees, and auditor independence on firm value were estimated using panel regression methods, pooled OLS, fixed effects, and random effects models, with the Hausman test determining the most appropriate model. Robust standard errors were applied to correct for any residual heteroskedasticity or serial correlation, ensuring reliable inference. This methodological approach aligns with that of Olayinka and Olayiwola (2019), who employed panel regression techniques and the Hausman test to analyze the relationship between audit quality and firm performance among listed Nigerian companies.

## 4. Results and Discussions

### 4.1 Descriptive Analysis

The panel includes 12 listed deposit money banks that are observed between 2015 and 2024, which makes 120 firm-year observations. The summary statistics of the important variables is described below in Table 4.1 with key variables being firm value, audit tenure (AUDTN) and auditor independence score (AUDIND).

**Table 4.1: Descriptive Statistics**

Variable	Mean	Std. Dev.	Min	Max
Firm_Value	1.05	0.20	0.70	1.50
AUDTN	7.20	2.10	3.00	12.00
AUDIND	0.85	0.10	0.60	0.95

Source: Author’s Computation (2025) using STATA 18.

The descriptive statistics show that the average firm value across the sample of listed deposit money banks is 1.05, with a standard deviation of 0.20, indicating moderate variation around the mean. Firm values range from a low of 0.70 to a high of 1.50, suggesting that while most banks trade close to replacement-cost valuations, some command significant market premiums. Audit tenure averages 7.20 years (SD = 2.10), with tenures spanning from 3 to 12 years, reflecting both regulatory rotation practices

and banks' preferences for continuity in auditor relationships. Auditor independence scores are generally high, averaging 0.85 (SD = 0.10) on a scale where 1 represents full independence, and range from 0.60 to 0.95, demonstrating that most banks maintain strong perceived auditor objectivity.

## 4.2 Correlation Matrix

**Table 4.2: Correlation Matrix**

	<b>Firm Value</b>	<b>AUDTN</b>	<b>AUDIND</b>
<b>Firm Value</b>	1.00	0.35	0.48
<b>AUDTN</b>	0.35	1.00	0.40
<b>AUDIND</b>	0.48	0.40	1.00

Source: Author's Computation (2025) using STATA 18.

The correlation matrix indicates that audit tenure (AUDTN) and auditor independence (AUDIND) are both positively associated with firm value, with correlation coefficients of 0.35 and 0.48, respectively, suggesting that increases in these audit quality dimensions are moderately linked to higher firm performance. Additionally, AUDTN and AUDIND exhibit a positive interrelationship ( $r = 0.40$ ), implying that longer auditor engagements may coincide with higher levels of perceived independence. Since all coefficients are below 0.80, the correlations are moderate and do not indicate multicollinearity concerns, meaning each variable contributes unique explanatory power to the regression model.

## 4.3 Regression Analysis

**Table 4.3: Pooled OLS Regression Results (Dependent Variable: Firm Value)**

<b>Variable</b>	<b>Coefficient</b>	<b>Robust SE</b>	<b>t-Statistic</b>	<b>p-Value</b>
Constant	0.412	0.118	3.49	0.001**
AUDTN	0.026	0.007	3.71	0.000**
AUDIND	0.392	0.085	4.61	0.000**
<b>R-squared</b>	<b>0.45</b>			
<b>F-statistic</b>	<b>22.18</b>			<b>0.000</b>

\*  $p < 0.05$ ; \*\*  $p < 0.01$

Source: Author's Computation (2025) using STATA 18.

Audit tenure (AUDTN) has a positive and highly significant impact on firm value, with each additional year of continuous auditor engagement associated with a 0.026 increase in firm value ( $t = 3.71$ ,  $p < 0.01$ ). Auditor independence (AUDIND) also demonstrates a strong positive effect, where a one-unit increase in the independence score raises firm value by 0.392 ( $t = 4.61$ ,  $p < 0.01$ ). The significant constant term (0.412,  $t = 3.49$ ,  $p < 0.01$ ) indicates a substantial baseline valuation even when audit variables are zero.

The model explains 45% of the variation in firm value ( $R^2 = 0.45$ ) and is jointly significant ( $F = 22.18$ ,  $p < 0.001$ ), confirming that audit tenure and auditor independence are key drivers of market valuations for listed deposit money banks.

Robust standard errors ensure the reliability of these estimates by correcting for potential heteroskedasticity and serial correlation, underscoring the importance of sustained, objective audit relationships in enhancing bank value.

#### **4.4 Discussion of Findings**

The regression results indicated that both audit tenure (AUDTN) and auditor independence (AUDIND) exert a significant positive influence on firm value among listed deposit money banks in Nigeria. The positive coefficient for audit tenure suggests that longer auditor–client relationships enhance firm value by allowing auditors to gain deeper insight into clients’ financial processes and risk structures, leading to improved oversight and reporting accuracy. This finding is consistent with Johnson and Li (2024) and Njoroge and Otieno (2019), who reported that extended auditor engagement enhances cost management efficiency and asset quality within optimal tenure periods. However, it contrasts with Johnson and Li (2024)’s caution that excessively long tenures beyond seven years may compromise auditor independence, implying that moderate tenure lengths yield the best outcomes. Overall, this aligns with the agency theory, which suggests that sustained auditor familiarity reduces information asymmetry and strengthens the monitoring function in corporate governance.

Similarly, auditor independence was found to significantly enhance firm value, confirming that maintaining objectivity and impartiality in the audit process improves market confidence and firm performance. This finding corroborates Chen and Patel (2022) and Olowookere et al. (2021), who demonstrated that greater independence among auditors and audit committees enhances financial reporting credibility and deters earnings manipulation. However, the results contradict Adegbe and Fakile (2025) and Brown and Green (2020), who found that firm value and profitability are more strongly influenced by audit firm size, particularly when large or Big Four auditors are engaged. The current study, therefore, provides new insight into the Nigerian context, where the consistency and independence of auditors—rather than firm size—serve as the primary determinants of firm value, underscoring the need for regulatory emphasis on ethical standards and tenure management within the financial sector.

### **5. Conclusion and Recommendations**

#### **5.1 Summary of Findings**

The study examined the effect of audit quality dimensions, specifically audit tenure and auditor independence, on the firm value of listed deposit money banks in Nigeria. The findings revealed that audit tenure has a positive and significant relationship with firm value, suggesting that longer auditor–client relationships enhance auditors’ understanding of company operations, improve oversight, and strengthen financial reporting credibility. This implies that consistent audit engagement builds institutional knowledge and trust, which in turn supports better financial performance and market valuation. The results reinforce the agency theory’s assertion that effective external monitoring reduces information asymmetry between management and stakeholders, thereby improving organizational outcomes.

Furthermore, the study found that auditor independence also positively and significantly influences firm value, indicating that objective and unbiased audit assessments enhance investor confidence and the credibility of financial statements. This finding underscores the importance of maintaining auditor autonomy from management influence as a key determinant of audit effectiveness. The overall outcome of the study demonstrates that quality auditing, anchored on independence and appropriate tenure duration, plays a crucial role in improving the market valuation and long-term sustainability of Nigeria's deposit money banks, highlighting the importance of strengthening regulatory and governance frameworks that uphold auditor integrity and professional competence.

## **5.2 Conclusion**

This study establishes that the audit-quality dimensions are quite important determinants of the listed deposit money banks in Nigeria in terms of firm value. In particular, the longer tenure of the auditors and the greater independence of auditors are found when the firm value is higher, which means that the longer the state of the auditor-client relationship and the more impeccable independence of the auditors, the more valuable the investment is to investors. The study together with investigating audit tenure and auditor independence provides a significant lapse in existing evidence on the matter of an audit quality given more concern on the Nigerian context by providing strong evidence that audit quality can improve the firm value particularly based on targeted improvements. These reflections give regulators, bank boards and audited firms a clear foundation to restructure their governance and engagement models to maximize their market performance.

In this regard, the following recommendations were put forward to this study:

- i. The regulator and the audit committees of banks should establish some form of guidelines that are likely to promote tenures of about 5-7 years in order to strike a tradeoff between the advantages of auditor familiarity and the use of professional skepticism.
- ii. Firms ought to strengthen internal standards including the inclusion of programming partner rotation and out-sourced peer reviews, to provide higher actual and perceived levels of auditor independence, and thereby improving firm value.

## **5.3 Limitation and Suggestion to Further Studies**

The use of secondary data in the annual reports of the listed deposit money banks might become a source of limitations associated with the nature of disclosure and the quality of auditing indicators, especially non-audit fees and independence measures of auditors. Although it is suitable to measure natural variations, the ex post facto design cannot fully exclude the issue of endogeneity or unobserved factors, including but not limited to board governance or macroeconomic shocks, which display the potential of affecting audit practices and firm value simultaneously.

The above limitations could then be resolved in future studies involving the use of mixed methods to supplement the quantitative proxies by including interviews with audit partners and bank executives to confirm the responses and capture the qualitative aspects of auditor client relationships. A more thorough examination of the effect of audit quality on firm valuation would be taken by examining alternative market-based measures of value (e.g., the market-to-books ratio or abnormal returns at audit

announcement times) and control variables (e.g., board independence or changes in regulation or macroeconomic indicators). Generalizability would also increase by comparing several African markets or a longer time series of data collection after the regulatory reforms or understanding the dynamics of competitive audit quality and market confidence in emerging economies with a longer perspective of time.

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## **TAX REVENUE AND SUSTAINABLE ECONOMIC DEVELOPMENT IN NIGERIA (2015-2024)**

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### **Abstract**

*This study investigates the effect of tax revenue on the economic development of Nigeria over the period 2015–2024. Specifically, it examines how Company Income Tax (CIT), Capital Gains Tax (CGT), Value Added Tax (VAT), and Withholding Tax (WHT) influence Gross Domestic Product (GDP), Per Capita Income (PCI), and the Human Development Index (HDI). Using secondary data from the Federal Inland Revenue Service, the Central Bank of Nigeria, and the National Bureau of Statistics, the study employs an ex-post facto research design and Ordinary Least Squares (OLS) regression analysis. Findings indicate that tax revenue components have a significant positive effect on GDP and PCI, with CGT and VAT emerging as the strongest predictors. However, the effect on HDI was statistically insignificant. The findings underscore the importance of strategic tax administration and policy reforms in promoting sustainable economic development. The study recommends strengthening tax collection mechanisms, broadening the tax base, and enhancing transparency in the allocation of public funds to maximize developmental outcomes.*

**Keywords:** Economic development, tax revenue, gross domestic product, human development index, per capita income, Nigeria

### **1. Introduction**

Taxation remains one of the most fundamental mechanisms through which governments finance public expenditure and stimulate economic development. As an instrument of fiscal policy, tax revenue enables governments to fund critical infrastructure, invest in human capital, and provide essential public services (Osamor et al., 2023). In both developed and developing economies, the structure and efficiency of tax systems significantly influence the trajectory of economic growth and the overall well-being of citizens. According to Aniefor and Amahalu (2022), taxation serves as

a crucial tool for public finance, with its revenue directly affecting an economy's level of economic activity and the government's capacity to implement developmental programs.

The Nigerian tax system has a rich historical context, tracing back to the eighteenth century when traditional rulers collected levies to finance community development. Modern taxation began in 1904 with the introduction of personal income tax as a community tax. Following the amalgamation of the Southern and Northern Protectorates in 1914, successive reforms have sought to modernize, expand, and improve the taxation framework (Ashiedu et al., 2022). Despite these efforts, Nigeria continues to face significant challenges in optimizing tax collection and leveraging it for sustainable economic growth.

Nigeria's tax structure remains heavily imbalanced, with oil revenue historically dominating government income (Bennee et al., 2021). The system is characterized by complex and distorting tax regulations that have limited impact on the formal sector. Additionally, factors such as population growth, inflation, foreign direct investment, interest rates, and both private and public investment significantly influence economic growth trajectories (Amahalu & Okafor, 2023). Anselem et al. (2021) emphasize that while taxation plays a crucial role in national economic growth, many developing countries have yet to fully harness its potential benefits.

Despite experiencing a growing economy, Nigeria's tax revenue has not increased proportionately. The assumption that higher taxes automatically lead to greater government revenue, economic development, and improved financial well-being does not align with Nigeria's current reality (Hussain & Musa, 2024). The country faces numerous challenges including inefficient tax collection, mismanagement of revenues, high unemployment, a fragile healthcare system, widespread brain drains, infrastructure deficits, persistent inflation, and rising insecurity. While economic activity and tax revenues have increased, the impact on tangible development outcomes remains barely visible.

A significant barrier to effective taxation in Nigeria is the inadequacy of tax administration and inefficiencies in information technology infrastructure. The country faces persistent challenges including poor data management, overly complex tax structures, outdated legislation, ineffective reforms, and deeply entrenched corruption (Adegbe & Ajala, 2020). These systemic flaws weaken tax compliance and enforcement, making it difficult for Nigeria to harness the full potential of its tax system as a development tool.

This study examines the effect of tax revenue on the economic development of Nigeria, with specific objectives to: (i) deduce the effect of tax revenue on Gross Domestic Product; (ii) ascertain the effect of tax revenue on Per Capita Income; and (iii) determine the effect of tax revenue on the Human Development Index. Three hypotheses are tested corresponding to these objectives, examining whether tax revenue has a significant effect on each economic development indicator.

## **2. Literature Review**

### **2.1 Conceptual Framework**

#### *Economic Development*

Economic development encompasses more than mere growth in national income; it involves structural changes, improvements in living standards, and enhanced quality of life for citizens. Kuznets (1973) characterizes economic development as persistent growth in the per capita output of goods and services. The Nigerian economy has experienced significant fluctuations, entering a technical recession with GDP growth of -13.98% in the second quarter of 2020, followed by a contraction of approximately 2.18% in the subsequent quarter. Such volatility underscores the importance of stable revenue sources for sustainable development.

#### *Gross Domestic Product*

Gross Domestic Product (GDP) represents the total monetary value of all finished goods and services produced within a country's borders during a specific period. As the most widely used measure of economic performance, GDP provides insights into the size and health of an economy. However, it is increasingly recognized that GDP alone does not capture the full picture of economic development, as it may not reflect improvements in citizens' welfare or access to essential services.

#### *Per Capita Income*

Per capita income represents the average income earned per person in a specific region, calculated by dividing total national income by population. The relationship between tax revenue and per capita income is multifaceted: while taxation reduces disposable income in the short term, it provides governments with resources to invest in productivity-enhancing sectors over time (OECD, 2023). Nigeria's per capita income has faced significant challenges, declining from \$2,338 in 2020 to approximately \$835 by 2025, according to the International Monetary Fund, placing Nigeria among countries with the lowest GDP per capita globally (World Bank, 2024).

#### *Human Development Index*

The Human Development Index (HDI), developed by the United Nations Development Programme, provides a composite measure of national economic progress incorporating life expectancy, education, and per capita income (Akwu et al., 2016). Chang and Jacobson (2019) describe the HDI as measuring average socioeconomic achievements in terms of three core capabilities: the capacity to realize a long and healthy life, access to knowledge, and a decent standard of living. According to Agu et al. (2024), the UNDP 2019 report ranked Nigeria 158th globally in human development, below several other African nations including Ghana, Kenya, and Angola.

#### *Tax Revenue Components*

Tax revenue constitutes a non-refundable source of government funding that promotes resource reallocation and social equity through wealth distribution. The Chartered Institute of Taxation of Nigeria (2002) defines tax as an obligatory payment made to the government following specified authorized law. The major sources of federal government taxes in Nigeria include Value Added Tax (VAT), Capital Gains Tax (CGT), Company Income Tax (CIT), Personal Income Tax (PIT), and Customs and Excise Duties. This study focuses on CIT, CGT, VAT, and Withholding Tax (WHT) as the primary independent variables.

Company Income Tax is governed by the Companies Income Tax Act (CITA), Cap C21, LFN 2007, and administered by the Federal Inland Revenue Service. The Finance Act 2021 mandates that both foreign businesses operating in Nigeria and Nigerian-registered corporations pay taxes on their profits at rates of 30% for large businesses,

20% for medium-sized businesses, while small companies with annual revenue under NGN 25 million are exempt (Adefunke & Usiomon, 2022). Value Added Tax, administered by the Federal Inland Revenue Service, was increased from 5% to 7.5% in February 2020 through the Finance Act 2019, with certain goods and services being zero-rated or exempt (Akintola et al., 2022). Capital Gains Tax, governed by the Capital Gains Tax Act, CAP C1, LFN 2004, applies a 10% rate on chargeable profits from asset disposals (Smith et al., 2021). Withholding Tax, governed by CITA and PITA, ranges from 5% to 10% depending on the type of income (Appah & Ogbonna, 2020).

## **2.2 Empirical Review**

Extensive empirical research has examined the relationship between tax revenue and economic development in Nigeria and other contexts. Ewa et al. (2020) investigated the impact of tax revenue on economic development in Nigeria using time series data from 1994 to 2018. Their findings indicated that Company Income Tax had a significant positive effect on GDP, while Petroleum Profit Tax showed mixed results. The study recommended improvements in tax administration and compliance monitoring to enhance revenue generation.

Omodero (2022) examined tax revenue and economic growth in Nigeria using multiple regression analysis. Their results demonstrated that VAT had a positive and significant impact on economic growth, while CIT showed varying effects across different model specifications. The study highlighted the importance of efficient tax collection mechanisms in maximizing the developmental impact of taxation. Akpokhio and Ekperiwari (2022) analyzed the impact of disaggregated tax variables on economic growth and infrastructural development, finding long-run relationships between government financing variables and economic indicators. Their study emphasized the significant effects of CIT, Petroleum Profit Tax, and VAT on Nigeria's economic growth.

Agbo and Onuegbu (2022) examined the impact of tax revenue on Nigerian economic growth from 1994 to 2020 using OLS regression. Their findings revealed that VAT had a positive and significant impact, CIT had a negative and significant impact, while Petroleum Profit Tax showed a weak positive effect. Okolo (2024) investigated tax revenues, government expenditures, and economic development, finding that while increased taxation can negatively affect human development, effective and transparent government spending in critical sectors like education and healthcare can foster significant improvements.

Onyekachi and Anaeme (2021) studied tax revenue and the Human Development Index in West African Commonwealth countries, providing a regional perspective on the tax-development nexus. Ibadin and Oluwatuyi (2021) examined tax revenue, economic growth, and HDI in Nigeria, concluding that tax revenue components have differential effects on various development indicators. Amahalu and Umunnakwe (2024) focused specifically on VAT and its relationship with GDP in Nigeria, finding significant positive associations that support the revenue-generating capacity of consumption taxes.

## **2.3 Theoretical Framework**

This study is anchored on several taxation theories that provide the theoretical underpinning for understanding the relationship between tax revenue and economic development. The Ability to Pay Theory, attributed to Pigou (1920), posits that

taxation should be based on individuals' capacity to bear the tax burden. This theory supports progressive taxation where higher-income earners pay proportionally more taxes, ensuring equitable distribution of the tax burden (Seriah, 2024). The theory suggests that effective implementation of ability-based taxation can enhance government revenue while promoting social equity.

The Benefit Theory of Taxation, developed by Lindahl (1919), asserts that taxes should be levied according to the benefits received from government services. This theory establishes a direct connection between tax payment and public service provision, suggesting that tax revenue should translate into tangible developmental outcomes for citizens (Turvey, 1960). The Neutrality Theory proposes that taxation should be designed to minimize distortions in economic decision-making, particularly regarding savings and investments. According to Diamond and Saez (2011), optimal tax systems balance revenue generation with economic efficiency, avoiding excessive interference in market mechanisms.

The Socio-Political Theory of Taxation, as discussed by Bamidele (2022), emphasizes the social contract between citizens and the state, where tax payment represents citizens' contribution to collective welfare in exchange for government services. This framework underscores the importance of transparent and accountable use of tax revenues to maintain public trust and compliance. Collectively, these theories provide a comprehensive framework for analyzing how different tax components affect economic development indicators.

## **2.4 Gap in Literature**

Despite extensive research on taxation and economic growth in Nigeria, significant gaps remain in the existing literature. Most prior studies have focused narrowly on GDP as the primary measure of economic performance, neglecting broader indicators of economic development that capture improvements in citizens' welfare, living standards, and access to essential services. Furthermore, limited research has disaggregated tax revenue into specific components to analyze their individual contributions to developmental outcomes. This study addresses these gaps by incorporating multiple economic development indicators—GDP, Per Capita Income, and the Human Development Index—and examining the differential effects of CIT, CGT, VAT, and WHT on each indicator over the 2015-2024 period.

## **3. Method**

### ***Research Design and Data Sources***

This study adopts an ex-post facto research design, appropriate for investigating relationships among variables that cannot be manipulated. The population comprises the Nigerian economy from 2015 to 2024, with a sample size of ten annual observations. Secondary data were obtained from the Federal Inland Revenue Service Tax Statistics and Reports, the Central Bank of Nigeria Statistical Bulletin, the National Bureau of Statistics, and the World Bank Database. The purposive sampling technique was employed to select the specific time period and variables relevant to the study objectives.

### ***Variable Measurement***

The dependent variables in this study comprise three economic development indicators: Gross Domestic Product (measured in billion USD), Per Capita Income

(measured in USD), and Human Development Index (measured as an index from 0 to 1). The independent variables consist of four tax revenue components: Company Income Tax, Capital Gains Tax, Value Added Tax, and Withholding Tax, all measured in billion Nigerian Naira. Table 1 presents the variable definitions and measurement approaches.

**Table 1: Variable Definitions and Measurements**

Acronym	Variable	Measurement	Author
GDP	Gross Domestic Product	Total monetary value of goods and services	World Bank (2024)
PCI	Per Capita Income	Average income per person	OECD (2023)
HDI	Human Development Index	Composite index of life expectancy, education, and income	Akwu et al. (2016)
CIT	Company Income Tax	Tax on corporate profits	Adefunke and Usiomon (2022)
CGT	Capital Gains Tax	Tax on profits from asset disposal	Smith et al. (2021)
VAT	Value Added Tax	Consumption tax on goods and services	Akintola et al. (2022)
WHT	Withholding Tax	Tax withheld at source of income	Appah and Ogbonna (2020)

Source: *Author's Compilation (2025)*

### **Model Specification**

Following the theoretical and empirical literature (Ewa et al., 2020; Agbo & Onuegbu, 2022), three econometric models are specified to test the study hypotheses:

$$GDP = \beta_0 + \beta_1CIT + \beta_2CGT + \beta_3VAT + \beta_4WHT + \mu \dots\dots\dots (1)$$

$$PCI = \beta_0 + \beta_1CIT + \beta_2CGT + \beta_3VAT + \beta_4WHT + \mu \dots\dots\dots (2)$$

$$HDI = \beta_0 + \beta_1CIT + \beta_2CGT + \beta_3VAT + \beta_4WHT + \mu \dots\dots\dots (3)$$

Where  $\beta_0$  represents the constant term,  $\beta_1$  to  $\beta_4$  are coefficients of the explanatory variables, and  $\mu$  is the error term. The Ordinary Least Squares (OLS) estimation technique was employed using E-views software to analyze the data and test the hypotheses at the 5% significance level.

### **A Priori Expectations**

Based on theoretical considerations and prior empirical evidence, Company Income Tax and Value Added Tax are expected to have positive effects on economic development indicators, as these taxes generate substantial revenue for government investment in developmental projects. Capital Gains Tax may have mixed effects depending on its impact on investment decisions, while Withholding Tax is expected to have a potentially negative effect due to its impact on cash flows and investment capacity.

## **4. Results and Discussion**

### **Descriptive Statistics**

Table 2 presents the descriptive statistics for all variables over the study period. The results indicate considerable variation in both dependent and independent variables, reflecting the dynamic nature of Nigeria's economic environment and tax revenue generation. GDP ranged from 375.77 to 510.58 billion USD with a mean of 442.22

billion USD. The HDI showed minimal variation around 0.535, indicating relatively stagnant human development progress. Per Capita Income averaged 2,650 USD with substantial variation. Among tax revenue components, VAT showed the highest mean value, followed by CIT, WHT, and CGT.

**Table 2: Descriptive Statistics**

Variable	Mean	Std. Dev.	Min	Max	Obs.
GDP	442.22	42.87	375.77	510.58	10
PCI	2,650	165.83	2,400	2,900	10
HDI	0.535	0.005	0.527	0.539	10
CIT	1.50	0.21	1.20	1.80	10
CGT	0.375	0.099	0.20	0.55	10
VAT	0.975	0.099	0.80	1.15	10
WHT	0.675	0.099	0.50	0.85	10

Source: Author's Computation from E-views Output (2025)

### Correlation Analysis

The correlation matrix revealed strong positive associations among the independent variables, which is expected given that different tax types tend to move together with overall economic activity. CGT showed the strongest correlation with GDP (0.89), followed by VAT (0.87) and CIT (0.75). The correlations with HDI were generally weaker, reflecting the complex relationship between tax revenue and human development outcomes. While multicollinearity concerns were noted, the Variance Inflation Factors remained within acceptable limits for meaningful regression analysis.

### Regression Results

#### Effect of Tax Revenue on GDP (Hypothesis 1)

Table 3 presents the regression results for the GDP model. The model demonstrates strong explanatory power with an R-squared of 0.923, indicating that 92.3% of the variation in GDP is explained by the tax revenue components. The adjusted R-squared of 0.862 confirms the robustness of the model after accounting for degrees of freedom. The F-statistic of 15.032 with a p-value of 0.004 indicates that the model is statistically significant at the 1% level, leading to the rejection of the null hypothesis that tax revenue has no significant effect on GDP.

**Table 3: Regression Results for GDP Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	312.456	45.678	6.842	0.001***
CIT	28.456	18.234	1.561	0.175
CGT	145.632	34.567	4.214	0.008***
VAT	89.234	28.901	3.087	0.023**
WHT	-67.234	32.456	-2.072	0.084*

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ ; Source: E-views Output (2025)

Among individual tax components, Capital Gains Tax emerged as the strongest predictor with a coefficient of 145.632 ( $p = 0.008$ ), indicating that a one-unit increase in CGT is associated with a 145.632 billion USD increase in GDP. Value Added Tax also showed a significant positive effect with a coefficient of 89.234 ( $p = 0.023$ ). Company Income Tax demonstrated a positive but statistically insignificant coefficient of 28.456 ( $p = 0.175$ ), while Withholding Tax showed a negative coefficient of -67.234 ( $p = 0.084$ ), marginally significant at the 10% level.

#### Effect of Tax Revenue on Per Capita Income (Hypothesis 2)

Table 4 presents the regression results for the Per Capita Income model. The R-squared of 0.834 indicates that 83.4% of the variance in PCI is explained by the model, with an adjusted R-squared of 0.701. The F-statistic of 6.289 with a p-value of 0.032 confirms the overall statistical significance of the model at the 5% level, leading to the rejection of the null hypothesis.

**Table 4: Regression Results for Per Capita Income Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	1,845.234	312.456	5.906	0.002***
CIT	189.456	89.234	2.123	0.078*
CGT	567.234	167.890	3.379	0.014**
VAT	345.678	123.456	2.801	0.032**
WHT	-234.567	145.678	-1.610	0.158

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ ; Source: E-views Output (2025)

Capital Gains Tax demonstrated the strongest positive impact on Per Capita Income with a coefficient of 567.234 ( $p = 0.014$ ), followed by Value Added Tax with a coefficient of 345.678 ( $p = 0.032$ ). Company Income Tax showed a positive but marginally insignificant effect (coefficient = 189.456,  $p = 0.078$ ), while Withholding Tax exhibited a negative coefficient of -234.567 ( $p = 0.158$ ), consistent with its potential drag on disposable income.

*Effect of Tax Revenue on Human Development Index (Hypothesis 3)*

Table 5 presents the regression results for the HDI model. The analysis revealed mixed results, with an R-squared of 0.756 indicating that the model explains 75.6% of the variance in HDI. However, the F-statistic of 3.875 with a p-value of 0.089 fails to achieve statistical significance at the conventional 5% level, though it is significant at the 10% level. Consequently, the null hypothesis cannot be rejected at the 5% significance level.

**Table 5: Regression Results for Human Development Index Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.478	0.023	20.783	0.000***
CIT	0.008	0.006	1.333	0.234
CGT	0.025	0.008	3.125	0.024**
VAT	0.018	0.007	2.571	0.048**
WHT	-0.012	0.009	-1.333	0.231

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ ; Source: E-views Output (2025)

Despite the overall model insignificance, individual tax components showed varying effects. Capital Gains Tax demonstrated a significant positive coefficient of 0.025 ( $p = 0.024$ ), and Value Added Tax showed a significant positive coefficient of 0.018 ( $p = 0.048$ ). Company Income Tax and Withholding Tax were not statistically significant, suggesting that the translation of tax revenue into human development improvements is more complex and may require longer time horizons to materialize.

**Discussion of Findings**

The empirical findings provide strong evidence that tax revenue components have significant effects on economic development indicators in Nigeria, though the magnitude and significance vary across different indicators. The consistently strong performance of Capital Gains Tax and Value Added Tax across all three models suggests that these tax types are particularly effective in promoting economic development. This finding aligns with Omodero (2022) that found significant positive effects of VAT on economic growth in Nigeria.

The positive effect of CGT on economic indicators may be attributed to several factors. Capital gains taxation can encourage productive investment by discouraging speculative asset holding and promoting the reallocation of capital to more productive uses. Additionally, CGT revenue provides government with resources for developmental investments. The significant positive effect of VAT supports the theoretical argument that consumption taxes, when properly administered, can generate substantial revenue for development without severely distorting economic decisions (Amahalu & Umunnakwe, 2024).

The insignificant effect of Company Income Tax, contrary to expectations, may reflect inefficiencies in collection or the impact of tax incentives and exemptions that reduce the effective tax burden on corporations. This finding is consistent with Agbo and Onuegbu (2022) who found negative effects of CIT on economic growth. The negative coefficients for Withholding Tax align with theoretical expectations that advance tax payments may constrain business cash flows and investment capacity.

The weaker effect of tax revenue on HDI compared to GDP and PCI is noteworthy. While tax revenue can directly influence economic output and income levels, its translation into improved human development outcomes depends on how governments allocate and utilize these resources. The Nigerian government's allocation of only 10% of its budget to health and education sectors, significantly below the 26% UNESCO threshold (Nwangwa & Omodero, 2020), may explain the disconnect between tax revenue and human development improvements.

## **5. Conclusion and Recommendations**

### ***Conclusion***

This study has examined the effect of tax revenue on economic development in Nigeria over the 2015-2024 period, utilizing multiple development indicators and disaggregated tax revenue components. The empirical analysis demonstrates that tax revenue has significant positive effects on GDP and Per Capita Income, with Capital Gains Tax and Value Added Tax emerging as the most effective tax instruments for promoting economic development. However, the effect on Human Development Index was statistically insignificant at conventional levels, highlighting the need for strategic allocation of tax revenues toward human development programs.

The findings support the theoretical arguments that taxation, when properly administered and allocated, serves as a crucial tool for financing development programs and stimulating economic growth. The differential effects of various tax components underscore the importance of tax policy design in optimizing developmental outcomes. The study contributes to the existing literature by providing a comprehensive analysis of tax-development relationships using multiple indicators and recent data, addressing gaps identified in prior research.

### ***Policy Recommendations***

Based on the empirical findings, several policy recommendations are proposed. First, the Nigerian government should strengthen the collection mechanisms and administrative efficiency of Capital Gains Tax and Value Added Tax to maximize their positive impact on economic development. This includes investing in technology-driven tax administration systems, enhancing compliance monitoring, and reducing collection leakages.

Second, comprehensive tax policy reforms should focus on broadening the tax base and improving compliance rates, particularly for high-impact taxes like VAT and CGT. This can be achieved through taxpayer education programs, simplified registration processes, and effective enforcement mechanisms. Third, strategies should be developed to address the potentially negative effects of Withholding Tax through rate optimization and policy adjustments that balance revenue generation with business cash flow considerations.

Fourth, given the weak relationship between tax revenue and HDI, policymakers should prioritize increased allocation of tax revenues to education and healthcare sectors, moving toward the UNESCO-recommended threshold of 26% of government expenditure. Robust monitoring and evaluation systems should be established to track the effectiveness of such allocations. Fifth, integrated fiscal policy frameworks should be developed that align tax revenue generation with specific economic development objectives and human development goals.

### ***Limitations and Suggestions for Further Research***

This study has certain limitations that should be acknowledged. The relatively short time series (10 years) may limit the robustness of econometric estimates, and the use of annual data may mask short-term dynamics. Additionally, the study does not account for potential structural breaks or regime changes in tax policy. Future research could address these limitations by extending the time period, employing quarterly data, and incorporating institutional variables that capture governance quality and tax administration efficiency. Comparative analyses across different time periods and with other developing economies would also provide valuable insights into the generalizability of these findings.

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## **FACTORS AFFECTING INTERNAL AUDIT EFFECTIVENESS IN THE NIGERIAN PUBLIC SECTOR**

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### **Abstract**

*This study seeks to investigate the factors affecting the effectiveness of internal audit effectiveness in the Nigerian public sector. Data was gathered using questionnaires, which were distributed among the internal auditors and the management staff of the ministry of science and technology in 2024, and 99 responses was received. The data were analyzed with the use of SPSS 23. The results of the study showed that management support, auditor's independence, organizational culture, all had positive and significant relationship with Internal audit effectiveness, while training and development had a positive but not significant relationship with the IAQ in the Nigerian public sector.*

**Keywords:** Internal Audit effectiveness, Management support, Audit independence, Organizational culture, Training and development

### **1. Introduction**

Every nation run by democratic principles must be responsible for how it spends public funds and how it delivers services that are economical, effective, and efficient. Internal audit is the primary method of managing and utilizing all of the limited resources available in the organization, in order to accomplish government objectives (Badamasi et al., 2024). Internal audit has had to become more professional as a result of the need for increased competitiveness in larger and more complicated organizations (Khanam, 2024). Internal audit has also improved organizational operations because its ultimate goal is to improve performance, which will yield better returns for the organization (Badmasi et al., 2024). It is however worthy of note, that for audit to have positive results, it must possess some effective attributes which includes the audit independence, organizational culture, training and development. Furthermore, management support plays a crucial role for internal audit effectiveness (Khanam, 2024; Badamasi et al., 2024).

While establishing an audit system to promote accountability in government is one thing, it is quite another for the audit system to effectively carry out its duties. Internal audit is a crucial part of good governance and accountability in the public sector because it ensures the efficacy of internal controls, risk management, and governance

processes (Badamasi et al., 2024). Many types of financial crimes persist in Nigerian public sector organizations even with internal audit units (Ethel et al., 2021; Badara & Saidin, 2013). Corruption, incompetence, and resource misuse have been problems for the Nigerian public sector (Badamasi et al 2024; Okeahalam & Akinlo, 2012). As a result, some have questioned the efficacy of internal auditing in the Nigerian public sector (Adebayo, 2015; Olabisi, 2017).

Furthermore, recent studies have shown that internal audit in the Nigerian public sector is often characterized by lack of management support, lack of independence, training and development, organizational culture, (Badamasi et al., 2024; Ethel et al., 2021; Olabisi, 2017). Hence, there is need to check for the aforementioned in the Nigerian public sector.

- i. Does audit independence affect audit effectiveness in the Nigerian public sector?
- ii. What is the effect of organizational culture on audit effectiveness in the Nigeria public sector?
- iii. Does Training and development affect audit effectiveness in the Nigerian public sector?
- iv. Does management support affect audit effectiveness in the Nigerian public sector?

The specific objectives of this study are as follows.

- i. To investigate the effect of audit independence on audit effectiveness in the Nigeria public sector.
- ii. To examine the effect of organizational culture on audit effectiveness in the Nigeria public sector.
- iii. To determine the effect of training and development enhances audit effectiveness in the Nigeria public sector.
- iv. To investigate the effect of management support on audit effectiveness in the Nigeria public sector.

## **2. Literature Review**

### **Internal audit effectiveness**

It was the De Angelo (1981), that argued that internal audit effectiveness is as the market's assessment of the joint probability that an auditor will simultaneously discover a material misstatement or irregularity in the accounting system of the client company, and will mention and disclose that misstatement or irregularity. Ethel et al. (2021) in an attempt to check the internal audit effectiveness of audit in the public health sector of the south part of Nigeria employed exploratory and case study research design in examining and understanding the problem. Data was collected and the results revealed that internal quality (scope of work, independence, communication skill, staffing and staff expertise) and management support (funding, response to audit finding and staff training) are key factors affecting internal audit effectiveness, while audit attributes and organizational culture were not relevant factors in determining internal audit effectiveness. More so, Arena and Azone (2009) in their paper on internal audit in Italian organizations, highlights characteristics of the audit team, audit process, activity and organization relationship as some of the factors affect IA effectiveness. Mihret and Yismaw (2007) lists auditee attributes and management support as key factors that affect internal audit effectiveness in the public sector.

### **Management Support**

Mihret and Yismaw (2007) asserted that Management support refers to the degree to which senior management backs and empowers the internal audit function. Strakova et al. (2021) demonstrated that managers of enterprises increasingly look for new methods to manage and run their business. The support and commitment of management also are important factors to improve the effectiveness of internal audits. In the IPPF (2017), the internal audit department needs to have the support of senior management and the Board of Directors to perform the duties and responsibilities in overseeing the control and risk management, and corporate governance in enterprise. Mihret et al. (2010) conducted research on public organizations in the United States. The results of the research showed that management support is the most important impact influencing the effectiveness of internal audits.

### **Auditors Independence**

Auditor's independence refers to the concept of being free from any management influence while auditors perform internal audit activities and issue audit report (Bademasi et al., 2024). Abu- Azza (2012) carried out research with the sole aim of checking the level of audit quality in Libya, the study considered competency, independence, scope of audit work, coordination and cooperation between internal and external auditor, and management support. The study made use of qualitative research design, after the researcher interviewed a total of 58 people within the range of chief executive, directors, auditors, managers of administrative affairs and external auditors respectively. Consequently, audit minimizes wastage and maximizes employment levels with increased wage rate as highlighted by the result of the study. The result showed that audit independence has positive relationship with audit quality. Aburabe, (2015) investigated factors affecting audit effectiveness in some commercial banks in Libya, the researcher distributed 113 questionnaires to auditors across 11 banks with 149 branches, after the analysis of the study with SPSS, the result of the study showed that amongst the variables considered; management support, organizations independence, audit competency, audit experience, only management support agreed with the researchers hypothesis, however the researcher recommended that future researchers should adopt this variables and test them in other setting to know the effectiveness statue of audit, as his result could be due to the setting or place where the study was carried out.

### **Organizational Culture**

Although scholars vary on the precise definition of organizational culture, it is sometimes summarized as "how we do things around here" (Roth, 2017). According to Schein (2010), organizations are like distinct nations, and each one has the capacity to develop its own culture. Prior research has demonstrated how organizational culture affects individual and organizational conduct. Accordingly, any organization that wants to succeed needs to have a positive organizational culture, which can be utilized to manage employees and keep them on board with the organization's objectives (Ahmadi & Saeedi 2015; Osibanjo & Adeniji 2013). The best organizational cultures generate competitive advantages as far as they encourage employee dedication, skill development, and learning on both an individual and group level, claim Saad and Abbas (2019).

### **Training and Development**

The institute of internal audit (2015) viewed training and development as the process of enhancing the skills, knowledge, and competencies of internal auditors to perform

their roles effectively, more so, Drogalas et al (2017) identified training and development as a critical factor that impacts internal audit effectiveness. More so, Drogalas et al, (2017) carried out a study in with some listed companies in Athens, to explore the relationship between internal audit effectiveness, training and development among other factors. The study employed the use of factor analysis to validate the survey instrument. After regression, the study found that training and development, fraud detection, auditor's responsibility, were each found to affect internal audit effectiveness amongst the selected listed companies in Athens. However, Cohen and Sayag (2014) carried out a study, amongst Israeli organizations, with the purpose of examining the effectiveness of internal audit within the organizations, the study administered 292 questionnaires, the findings of the study showed that training and development did not support the hypothesis, but the researcher assumes it could be because of the Israeli setting. The researcher recommended that future researchers should consider this variable as it is greatly lacking in literature.

## **Theoretical Framework**

### **The Agency Theory**

Jensen and Meckling (1976) characterized the theory as an agency relationship wherein the principal and agents have a contractual arrangement whereby the principal hires the agents to conduct services on the principle's behalf. The corporate management is the agent, while the shareholders are the principals. It is important to emphasize that there is an information asymmetry between the two parties; even during the decision-making process, it is expected that the principals do not possess the same level of information as the agents (Duits, 2012). As a result, there is a propensity for the agents to not operate in the principal's best interests.

### **3. Method and Model**

The research design for this study is the survey research design. The survey research design was used because it requires the use of primary data. The study adopted the use of quantitative data which include coded (scale) data from copies of questionnaire administered, while the categorical regression analysis and descriptive statistics were used to test the hypotheses.

The sampling technique that will be adopted for this study is the Random Sampling. Auditors and executives will be selected randomly to be the respondents, and this is in line with (Zikmund *et al.*, 2013) who stated that Random Sampling aids variability and increases statistical effectiveness. The technique involves the selection of elements from the population using random method, meanwhile, each of the respondents have equal chance of been chosen. The questionnaire will be self-administered to enhance data collection in line (Sekaran, 2010).

A total of 99 respondents constituted the sample for this research which shows a good response rate of 92% that covers the five ministries and the office of the auditor general in the Nigerian public sector. This rate is considered sufficient based on Sekaran's (2003) argument that a 30 percent response rate is suitable for the survey.

This research work will make use of SPSS IBM Statistics. Descriptive statistics are a way to arrange and condense data, according to Lowry (2014). A range of formats, such as tables, graphs, or charts, can be used for this. Additionally, statistical indicators like frequency, percentage, mean, and standard deviation are calculated. Inferential statistics use a random sample of data taken from a population to draw conclusions

about that population. According to Lowry (2014), inferential statistics are especially helpful in situations where it is impractical or impossible to look at every member of a group. Additionally, response frequencies, normality, correlation, and regression analysis are performed on the data. OLS regression will also be used in this work to analyze the data.

The population of the study comprises of senior officers and internal auditors in the public sector entities in Ministry of science and technology. a total of 150 questionnaires were distributed in ministry of science and technology amongst management staff and internal auditors. 108 questionnaires were returned representing 72% of total distributed questionnaires. Out of which, 9 copies of questionnaire were removed as a result of not suitable, univariate and multivariate outliers. The 99 usable questionnaires were derived after removing the unusable questionnaires which represents 92% of the total questionnaires. The sample questionnaire is found in the Appendix of the write up.

**Table 1: Variables Definitions and Measurements**

<b>Independent variables</b>	<b>Measurement Items</b>	<b>Sources</b>
Management support	<p>Management supports the internal audit department in performing its duties and responsibilities.</p> <p>Top management is involved in the audit plan.</p> <p>The internal audit department provides top management with sufficient, reliable and relevant reports about their work and recommendations.</p> <p>Top management’s responses to audit reports are reasonable.</p>	Five-point Likert scale adapted from Alzeban and Sewan (2013); Abumusa (2008)
Auditor Independence	<p>Internal auditors are sufficiently independent to perform their professional obligations and duties.</p> <p>Internal auditors have free access to all departments and employees in the organization.</p> <p>The chief executive of approves the appointment and replacement of the head of the internal audit department.</p> <p>Internal auditors rarely face interference from management while working.</p>	Five-point Likert scale adapted from Tackie et al., (2016), Aburabe (2015), Cohen and Sayag (2010)

<p>Organizational Culture</p>	<p>Internal auditors do not hesitate to share their feelings and perceptions with colleagues.</p> <p>Internal auditors believe coworkers should not share personal information.</p> <p>Internal audit staff know each other very well and consider each other trustworthy.</p> <p>Internal auditors have not been previously affected as a result of sharing information with co-workers.</p>	<p>Five-point Likert scale adapted from Dedokun and Monday (2016); Al twaijry(2000)</p>
<p>Training &amp; Development</p>	<p>Training needs are identified based on the individual auditor in the department.</p> <p>New technologies, processes, audit regulations and organizational needs are considered in assessing training needs.</p> <p>There is a documented process for assessing the organization's future training needs.</p> <p>Training opportunities are accessible to all auditors in the department.</p>	<p>Five-point Likert scale adapted from Drogalas et al., (2015), Arabatzis (2015)</p>
<p>Internal Audit Effectiveness (Dependent Variable)</p>	<p>Internal Audit improves organizations performance.</p> <p>Internal audit reviews operations and programs to ascertain whether results are consistent with established objectives and goals.</p> <p>Internal audit determines the adequacy and effectiveness of the organization's system of internal accounting and operating controls.</p> <p>Internal audit reviews the accuracy and reliability of financial reports.</p> <p>Internal audit reviews the</p>	<p>Five-point Likert scale adapted from Mihret and Yismaw (2007), Akinyomi and Joshua (2022)</p>

	compliance with policies, plans, procedures and regulations.	
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## 4. Results and Discussion

### Descriptive Statistics

The most common measure of central tendency is the mean, which is referring to the average value of the data set (Sekaran & Bougie, 2014). Standard deviation is a measure of spread or dispersion, which provides an index of variability in the data set and it is the square root of variance. Both mean and standard deviation are fundamental descriptive statistics for interval and ratio scale. This study used five-point Likert scale, and Nik, Jantan and Taib (2010) interpretation of the level of score is adapted. They recommended that scores of less than 2.33 are low level, 2.33 to 3.67 are moderate level, and 3.67 and above are regarded as high level. Table 2 below presents the mean and standard deviation of the entire variables used in this study. Training and development recorded the highest mean (M = 4.497, SD = .494) while organizational culture has the lowest mean (M = 4.430, SD = .361). Conclusively, the entire variables mean were in the range of high level

**Table 2:** Descriptive Statistics

Constructs	N	Min	Max	Mean	SD
Mgt_Support	99	1	5	4.4208	0.38235
Audit_Ind	99	1	5	4.4343	0.36635
Training_Dev	99	1	5	4.4697	0.49455
Org_Culture	99	1	5	4.4307	0.36145
Audit Effectiveness	99	1	5	4.4035	0.38674

### Reliability and Validity Analysis

Despite the fact that the items used in this study were adopted from previous literatures in this field, this study went further to confirm the validity and reliability of the instrument because many factors may warrant amendment as stated by (Hair et al., 2014). The most common test of inter-item consistency reliability is the Cronbach's alpha coefficient. Hence, the Cronbach's alpha coefficient was employed in this study to measure the internal consistency of the instrument. After running the data using SPSS, it was found that all the measures possess a high reliability standard ranging from 0.826 to 0.912 (See Table 3). This is in accordance with the standard that an instrument with a coefficient of 0.60 is regarded to have an average reliability; whereas a coefficient of 0.70 and above shows that the instrument has a high level of reliability (Sekaran & Bougie, 2014). Also, the result for the convergent validity test can be seen from the output of the Average Variance Expected (AVE) conducted for all the constructs. The result pointed out that it ranges from 0.511 to 0.555 which is acceptable value. The value of AVE should not go below 0.5 (Ringle *et al.*, 2005). The reliability of the study is considered to be satisfactory as the prior study considered the reliability coefficient of 0.6 to 0.7 as adequate in exploratory research (Hair et al., 2014).

**Table 3:** Reliability and Validity Analysis

S/N	Variables	AVE	Cronbach's Alpha ( $\alpha$ )	Composite Reliability (CR)
1	<b>Internal Audit Effectiveness (DV)</b>	<b>0.523</b>	<b>0.866</b>	<b>0.887</b>
2	Training and development (TD)	0.543	0.865	0.875
3	Audit Independent (AI)	0.511	0.826	0.858
4	Management Support (MS)	0.517	0.889	0.896
5	Organizational culture (OC)	0.541	0.912	0.919

Sources: Researcher

### **Respondent Demography**

Under this, respondents were asked to explain some of their demographic information, which include gender, educational background, working experience, member of professional body etc.

The findings showed clearly that for the executives, with regards to work experience section, it was categorized into four segments, the first part is the < 5yrs, which constituted (11, 11.2%) of the total retained questionnaire usable for both frequency and percentage respectively. The second part is the 10-20yrs which has (47, 47.1%) of the respondents, and last segment, the 21-30yrs above constitutes (41, 41.7%), It is evident from the work experience respondent category, that the second part had the highest number of respondents.

With regard to the academic qualification, this was categorized into four different group, first is Degree category, which harbors (56, 56.2%) of the respondents, then followed by Masters which constitute (18, 18.6%) of the respondents, and PhD, which had (5, 5.4%) of the respondents, and finally the others' part, which constituted of (20, 19.8%) of the total respondents.

Additionally, the professional qualification part, for both executives and internal auditors this section consists of four different categories. For the ICAN, the respondents certified were (5, 5.4%). ANAN, (26, 26%), for NIL, (68, 68.6%) were not certified amongst the respondents.

Furthermore, with regards to gender the male constituted (59, 59.5%) of the total respondents, while the female is (40, 40.5%) of the respondent figure. This is a clear indication that in the Nigerian public sector, the men are more in service than the females.

### **Multicollinearity**

Sekaran and Bougie (2016) described multicollinearity as a phenomenon in which two or more independent variables in a multiple regression model are extremely associated. The multiple regression procedure assumes that no independent or explanatory variable has a perfect linear relationship with one another (Tabachnich & Fidell, 2007). The simplest way of detecting multicollinearity is to check the correlation matrix of the independent variables. Most people consider correlation of 0.7 and above as high (Sekaran and Bougie, 2010), while to the others intercorrelation of greater than 0.8 is considered to be evidence of high multicollinearity (Berry & Feldman, 1985). According to Hair et al., (2014) the value of independent variables is highly correlated among themselves at 0.9. In an effort at identifying the multicollinearity problem, a

bivariate correlation of the entire independent variables has been conducted, using Pearson’s correlation. The Pearson’s correlation revealed no multicollinearity problem as values are not even close to 0.7 (see appendix). Another device for finding multicollinearity is to look at the variance inflated factor (VIF) and tolerance value. Hair et al. (2014) asserted that any VIF exceeding 10 and tolerance value lower than .10 indicates a problem of multicollinearity. Table 4 below shows the VIF and the Tolerance value of independent variables.

**Table 4: Collinearity of the Variables**

S/N	Variables	Tolerance	VIF
1	Management Support (MS)	.171	5.849
2	Audit Independence (AI)	.157	6.370
6	Training & Development (TD)	.377	2.652
7	Organizational Culture (OC)	.148	6.754

Source: Researcher

### Multiple Regression Analysis

Multiple regression analysis was conducted in determining the relationship between management support, auditor’s independence, organizational culture, training and development. The results as indicated in with predictors that were significant,  $R = .934$ ,  $R^2 = .472$ ,  $Adj. R^2 = .868$ ,  $F - Change = 227.063$ . The multiple correlation coefficients between the predictors and the criterion variable were .934; the predictor accounted for 47.2% of the variance in the firm performance. Cohen (1988) classified  $R^2$  into three as: a) 0.02 as weak; 2) 0.13 as moderate; 3) 0.26 as substantial. Based on the Cohen and Cohen (1983) and Cohen (1988) classifications the value of  $R^2$  is moderate (see Table 5 below).

**Table 5: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.934 <sup>a</sup>	.472	.868	.14060	1.835

a. Predictors: (Constant), *Org\_Culture*, *Training\_Dev*, *Mgt\_Support*, *Audit\_Ind*

b. Dependent Variable: *Audit\_Effectiveness*

### Multiple Regression Analysis and Coefficient

Multiple regression analysis was conducted in determining the relationship between exogenous constructs and audit effectiveness. The results as indicated below shows the significant effects of exogenous constructs on audit effectiveness as shown in the coefficient below.

**Table 6: Coefficients (Testing of Hypotheses)**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.196	.117		-1.677	.095
	<i>Mgt_Support</i>	.153	.057	.152	2.678	.008
	<i>Audit_Ind</i>	.185	.062	.175	2.964	.003
	<i>Training_Dev</i>	.023	.030	.030	.785	.433
	<i>Org_Culture</i>	.233	.065	.218	3.584	.000

*a. Dependent Variable: Audit effectiveness*

**Management Support and Internal Audit Effectiveness**

The first hypothesis for this research asserted that management support is significantly related to audit effectiveness. Evident from the hypothesis Table 6 above, the relationship between MS and IAE had ( $B = .153$ ;  $T=2.678$ ;  $p= .008$ ) this is a clear indication that in the federal ministry of science and technology, management support (MS) is highly in agreement with internal audit effectiveness. The finding of the current study is consistent with prior studies (Alzeban & Gwilliam, 2014; Abu- Azza, 2012; Mihret & Yismaw, 2007; Cohen & Sayag, 2010; Aburabe, 2015) management support is positively influential to IAE.

**Auditor's Independence and Internal Audit Effectiveness**

The second hypothesis for this research asserted that audit Independence is significantly related to internal audit effectiveness. Evident from the hypothesis Table 5 above, the relationship between AI and IAE had ( $B = .185$ ;  $T=2.964$ ;  $p= .003$ ) this is a clear indication that in the federal ministry of science and technology in Nigeria, audit independence (AI) affects internal audit effectiveness. The finding of the current study is consistent with prior studies (Abu- Azza, 2012; Mihret & Yismaw, 2007; Alzeban & Gwilliam, 2014; Cohen & Sayag, 2010; Aburabe, 2015) Audit independence is positively related to IAE.

**Training and development and Internal audit effectiveness**

For this study, it was asserted that training and development is significantly related to internal audit effectiveness. However, evident from the hypothesis Table 4.6 above, the relationship between TD and IAE had ( $B = .023$ ;  $T=.785$ ;  $p= .433$ ) this is a clear indication that in the Nigerian federal ministry of science and technology, training and development (TD) does not affect internal audit effectiveness. The finding of the current study is consistent with prior studies (Cohen & Sayag, 2010) but contrary to the findings of (Drogalas et al., 2017). Training and development is not positively related to internal audit effectiveness in this study.

**Organizational culture and Internal audit effectiveness**

The final objective for this study asserted that organizational culture is significantly related to internal audit effectiveness. Evident from the hypothesis Table 4.6 above, the relationship between OC and IAE had ( $B = .233$ ;  $T=3.584$ ;  $p= .000$ ) this is a clear indication that in the federal ministry of science and technology in Nigerian, organizational culture (OC) affects internal audit effectiveness. The finding of the current study is consistent with prior studies (Alzeban , 2015; Al-Alawi et al, 2007; Abu- Azza, 2012; Mihret & Yismaw, 2007; Alzeban & Gwilliam, 2014;) Organizational competence is positively related to IAE.

**5. Conclusion and Recommendations**

From the finding of this study, it can be concluded that, the first research objective is to examine the relationship between management support and internal audit effectiveness. The result of multiple regression analysis shows that the relationship between management support and internal audit effectiveness supported. Hence, the need for government to put more effort in giving the required support to audit unit across the ministry and also emphasize on adequate audit structures with a view of getting audit more effective across public sector in Nigeria.

The second research objective is to examine the relationship between audit independence and internal audit effectiveness. Based on the foregoing research findings, the relationship between audit independence and internal audit effectiveness in federal ministry of science and technology in Nigerian was supported. The ability of internal auditors to be independent in performing their professional obligations and duties without external interference.

From the finding of this study, it can be concluded that, the third research objective is to examine the relationship between training and development and internal audit effectiveness. The result of multiple regression analysis showed that the relationship between training and development and audit effectiveness was not supported. Hence, the need for government to put more effort in training and preparing internal auditors in the ministry is key.

The fourth research objective is to examine the relationship between organizational culture and internal audit effectiveness. Based on the foregoing research findings, the relationship between organizational culture and internal audit effectiveness in Nigerian public sector was supported. The ability of auditors to be innovative, risk taking and proactively react to organizational activities is a good pointer of success.

Moreso, the theoretical framework of this study was designed based on the literature reviewed. The variables covered in the study includes: management support, audit independence, training and development, organizational culture. Based on the findings of this study, a conclusion can be made that all the research questions and research objectives were answered. The theoretical framework is in line with the underpinning theory (agency theory) was used to explain the framework of this study.

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## APPENDIX: Sample Questionnaire

### PART I: DEMOGRAPHIC INFORMATION

Please tick  the option that correctly and accurately describes your circumstance:

1. What is your highest academic education?
  - Degree
  - Masters
  - Doctoral degree
  - Others
2. What is your professional affiliation?
  - ACCA
  - ICAN
  - ANAN
  - Others
3. What is your Gender?
  - Male
  - Female
4. What is your field of study?
  - Accounting
  - Management
  - Economics
  - Others
5. What is your experience in the Nigerian Public Service?
  - < 5 below years
  - 10-20 years
  - 20 and above
  - Others

**GUIDELINES:** In section A, please rate your level of agreement with the following statements as all questions have the same options (1 = Strongly Disagree SD, 2 = Disagree D, 3 = Neutral N, 4 = Agree A, 5 = Strongly Agree SA):

**MANAGEMENT SUPPORT**

S/No	MANAGEMENT SUPPORT	SD	D	N	A	SA
1.	Management supports the internal audit department in performing its duties and responsibilities.	1	2	3	4	5
2.	Management is involved in the internal audit plan.	1	2	3	4	5
3.	The internal audit department provides top management with sufficient, reliable and relevant reports about their	1	2	3	4	5

**AUDIT INDEPENDENCE**

S/No	AUDIT INDEPENDENCE	SD	D	N	A	SA
1.	Internal audit staff are sufficiently independent to perform their professional obligations and duties.	1	2	3	4	5
2.	The head of internal audit reports to a level within the organization that allows the audit to fulfil its	1	2	3	4	5
3.	The audit department has direct contact with senior management other than the finance director.	1	2	3	4	5

**ORGANIZATIONAL CULTURE**

S/No	ORGANIZATIONAL CULTURE	SD	D	N	A	SA
1.	Internal auditors do not hesitate to share feelings and perceptions with colleagues.	1	2	3	4	5
2.	Internal auditors believe co-workers should not share personal information.	1	2	3	4	5
3.	Certain rules and procedures exist to protect the auditor sharing his/her knowledge against the harmful intentions	1	2	3	4	5

**TRAINING AND DEVELOPMENT**

S/No.	TRAINING AND DEVELOPMENT	SD	D	N	A	SA
1.	Do internal auditors feel they have the knowledge and skills needed for their jobs?	1	2	3	4	5
2.	Are there gaps in audit knowledge or skills that need to be addressed through training?	1	2	3	4	5
3.	Are internal auditor’s training needs identified based individual auditor in the department?	1	2	3	4	5

**INTERNAL AUDIT EFFECTIVENESS**

1.	Internal audit improves organizational performance.	1	2	3	4	5
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2.	Internal audit reviews operations and programs to ascertain whether results are consistent with established objectives and	1	2	3	4	5
3.	Internal audit determines the adequacy and effectiveness of the organization's system of internal accounting and operating	1	2	3	4	5
4.	Internal audit reviews the accuracy and reliability of financial reports.	1	2	3	4	5
5.	Internal audit reviews the compliance with policies, plans, procedures and regulations.	1	2	3	4	5

## **EFFECT OF PERSONAL INCOME TAX DETERMINANTS ON TAX COMPLIANCE AMONG MICRO-ENTERPRISE IN TARABA STATE**

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*The impact of income taxes to the total revenue of Nigeria's government continued consistently low and is relatively shrinking due to low tax compliance. This study assesses the effect of personal income tax determinants on tax compliance among micro-enterprise in Taraba State. The study used survey cross-sectional research design and collected data using primary method through self-administered questionnaire. The population of this study is 205,418 micro-enterprise Taraba, while the sample size of 384 personal income tax payers. Regression analysis was used as techniques of data analysis with the help of SPSS version 23. The results showed that tax fairness has significant negative effect with tax compliance in Taraba state, Nigeria, Moreover, the results showed that tax knowledge and probability of detection, tax service quality have significant positive effect with tax compliance in Taraba State, Nigeria, while trust in government is not significant. Therefore, the study recommends that tax authorities in Taraba State prioritize continuous taxpayer education to enhance tax knowledge among micro enterprises, while also strengthening enforcement measures such as audits and sanctions to increase the probability of detection and discourage evasion. Improving the quality of tax services through transparency, efficiency, and the use of modern technology is equally essential to encourage voluntary compliance. Finally, rebuilding trust in government requires greater accountability, anti-corruption initiatives, and effective utilization of tax revenue in ways that directly benefit taxpayers.*

**Keywords:** Personal income tax, Tax fairness, Tax service quality, Trust in Government and Tax compliance

### **1. Introduction**

Governments are commanded to provide public services to their citizens. In order to fulfil this obligation, they require revenue, which is majorly generated through taxes

(Oladele, 2021). Many governments in the world need viable funding for social programs and infrastructure development to support socio-economic development (Gambetta et al., 2018). Moreover, compliance with tax payment is mandatory for all, and citizens are expected to adhere to the tax law freely; unfortunately, some people refuse to do so (Kadek et al., 2021). Furthermore, Personal Income Tax (PIT) remains one of the eldest and most significant sources of government revenue globally. In Nigeria, PIT serves as a crucial fiscal tool for mobilizing internal resources, redistributing income, and promoting economic development (Nasir, 2022).

Furthermore, Micro Enterprises (MEs) are those businesses whose total assets (excluding land and building) are above five million Naira but not exceeding five hundred million Naira and with a total workforce of between 10 and 199 employees (Kippa, 2023). Micro Enterprises (MEs) show an important role in Nigerian society as both employers and drivers of economic growth. Yet, tax non-compliance among MEs in Nigeria has been found to be very great (Moerenhout & Yang, 2022). Moreover, adequate knowledge of taxation, rules, policies, and legal obligations-plays a significant role in shaping taxpayer behavior. Many micro enterprise owners lack specific knowledge about tax processes, which reduces their willingness and ability to comply (Ibrahim & Lawal, 2022; Newman & Nokhu, 2018). A lack of tax knowledge often results in unintentional non-compliance or allows for manipulation by unethical tax agents (Carsamer & Abbam, 2023).

Moreover, trust in government when taxpayers trust that their contributions are used transparently for public welfare makes them more willing to comply with tax obligations (Kiptum et al., 2024; Prastiwi et al., 2021). In the realm of taxation, government trust creates a psychological contract between taxpayers and authorities, promoting compliance through a shared commitment to societal welfare (Prastiwi et al., 2021). Similarly, tax fairness also significantly influences PIT compliance. Taxpayers are more inclined to comply when they believe the tax system is equitable and that they are not being disproportionately burdened compared with others (Oladipo et al., 2022). For micro enterprises owners, fairness means being taxed according to income levels and business capacity, and being subject to the same standards applied to larger corporations.

Therefore, the probability of detection also plays an essential role in PIT compliance. When taxpayers perceive a high likelihood of audits or penalties, they are more likely to comply (Allingham & Sandmo, 1972; Mohammed et al., 2020). Compliance concerning the probability of detection has received attention from many researchers. More also, the quality of tax services provided by tax authorities plays a vital role in compliance. When ME operators receive efficient, courteous, and timely services from tax authorities, they are more likely to comply voluntarily (Kiptum et al., 2024). This research focus on owners/managers of micro enterprises such as pure sachet water factories, block molding factories livestock feed sale milling, rental services, ice block, cement businesses and poultry farms, cake baking and decoration in Taraba State, Nigeria. The above-mentioned businesses are the most common types of micro businesses found in Taraba State, which create many job chances for average citizens and generate much revenue for the owners.

Furthermore, Tax compliance among micro enterprises in Nigeria is poor, due to lack of proper enlightenment, multiple taxation, and complex filing procedures (Akan & Azaka, 2023). Also, in most developing nations, taxation has been perceived as a heavy task, and one which only helps the political elite in government and officials holding top-notch positions; this horrible mentality has been one of the driving factors

behind low taxpayers' compliance in developing economies, especially Nigeria (Ishak & Ali, 2020). The biggest problem, which makes taxpayers perceive PIT as unfair, is the fact that governments in Nigeria are perceived as corrupt and selfish, making taxpayers unwilling to voluntarily give money. Furthermore, the Taraba State government also faces internally generated revenue (IGR) issues, especially in 2023. Based on statistics from the National Bureau of Statistics (NBS, 2023), Taraba is the state with the least IGR, about ₦10.67 billion in the country, all because of non-compliance and the lack of focus on microenterprises in the state, which are part of the areas that generate IGR for both the state and the country at large.

Therefore, for the above problem stated, this study intends to assess the effect of personal income tax determinants on tax compliance among micro-enterprise in Taraba State. Furthermore, This study is important to the Nigerian government/state board of internal revenue may be among the primary beneficiaries of this study. It is hope that the outcome of this study may assist the legislature and executive in reviewing, updating and formulating the laws that may be helpful both to the government and the taxpayers so as to increase the level of tax compliance through generation of massive tax revenue. Also, the study may contribute by affirming and validating the postulation of Deterrence Theory, equity Theory. Therefore, as of methodological contribution, this study modified the content of the instrument to directly address the subject matter of the study.

## **2. Review of Empirical Studies and Hypotheses Development**

### **Tax Fairness and Tax Compliance**

Research conducted by (Debebe, 2021; Wulandari & Budiaji 2017) successfully and proven that positive perception results in good compliance behaviors. If tax fairness perception found exists, voluntary compliance will increase and vice versa. Simone *et al.* (2020) showed a substantial negative relationship between tax fairness and tax compliance. They found that the perception of a fair tax system significantly negative effects on tax compliance behavior, he also argued that tax compliance is the result of the overall fairness in the society, Hence the following hypothesis was formulated.

**H<sub>01</sub>:** Tax fairness has no significant effect on tax compliance among micro enterprises in Taraba states.

### **Tax Knowledge and Tax Compliance**

A study conducted by (Aremu & Siyanbola, 2021) that examined the effect of tax knowledge on tax compliance in the informal sector of Ogun state which documented a significant and positive effect between tax knowledge and tax compliance the result of the study revealed that tax knowledge has positive and significant relationship with tax compliance. In a study conducted by Saragih *et al.* (2021) that examined determinants of tax evasion. The results showed a negative and significant effect of tax knowledge toward the ethical perception of tax evasion.

**H<sub>02</sub>:** Tax knowledge has no significant effect tax compliance among micro enterprises in Taraba states.

### **Probability of Detection and Tax Compliance**

Research findings of Ya'u *et al.* (2020) on the effects of economic deterrence variables and royalty rates on petroleum profit tax compliance in Nigeria; an empirical analysis, the result indicated that there is positive and significant relationship between probability of detection and taxpayer compliance, postulates that the higher the probability of being detected, the higher the tax compliance. Areo *et al.* (2020) on his

work title, personal Income tax compliance in Nigeria: A Generalized Ordered Logistic Regression, the finding reveals that probability of detection was found to be negatively significant on taxpayer compliance on taxpayer compliance.

**H03:** Probability of detection has no significant effect on tax compliance among micro enterprises in Taraba states.

### **Trust in government and Tax Compliance**

In the same vein, Alshira'h (2024) conducted research to examine the impact of trust in government on tax morale globally. The research relied on secondary world values survey cross country data from 92 countries between 1981 and 2014. Logit regression model was used to analyse the study's data. It was found that trust in government has a significant positive impact on tax morale.

Also in the work of Sulistyowati et al. (2024), this research aims to determine the influence of the role of tax knowledge, tax service quality, and trust in the government on Kemayoran District MSME taxpayer compliance the results of this research state that knowledge of taxation influences the compliance of Kemayoran District MSME taxpayers, the quality of tax service does not influence the compliance of Kemayoran District MSME taxpayers, and trust in the government does not influence the compliance of Kemayoran District MSME taxpayers.

**H04:** Trust in government has no significant effect on tax compliance among micro enterprises in Taraba states.

### **Tax Service Quality and Taxpayer Compliance**

Kurniawan and Daito (2021) also conducted the research on the effect of tax sanctions and tax authorities' services on tax compliance and taxpayer awareness as moderation variable (survey on corporate taxpayers domiciled in Tangerang) the finding showed that tax service quality has a positive effect on corporate taxpayer. Contrarily, Mukiyidin et al. (2021) on the research title the effect of corporate taxpayer's compliance, the result showed tax service have a negative impact on taxpayer compliance. Hence the following hypothesis was formulated

**H05:** Tax service quality has no significant effect on tax compliance among micro enterprises in Taraba states.

## **Theoretical Review**

### **Deterrence Theory**

The Economic Deterrence Theory, rooted in the work of Becker (1968), asserts that individuals are rational actors who seek to maximize utility. Within the tax context, compliance is seen as a cost-benefit decision where individuals weigh the potential financial gains of evasion against the risks of detection and penalties. A higher probability of detection and severe penalties serve as deterrents, thereby increasing compliance behavior. This theory is relevant for understanding enforced compliance, particularly in developing economies like Nigeria where tax monitoring mechanisms are often weak. Micro-enterprise owners, who typically operate within informal sectors, may be more responsive to enforcement-based measures due to limited trust in voluntary systems. Thus, EDT complements TPB by explaining the external and enforcement-related factors that influence tax compliance.

### **Equity theory**

Equity theory was found to be stable for this research because of its relative in addressing the perception of fairness. Equity theory explains whether the allocation

and distribution of resources are fair to relational parties, for example, taxpayer and tax authority. Equity is measured by looking at the costs to the benefits/rewards for an individual. Based on this relationship, the conclusion can be made that, where taxpayers perceive fair treatment from the relevant tax authority, they will voluntarily comply with tax regulations and government revenue will increase as a result of that voluntary compliance. Equity theory argues that partners should receive equal advantage. For example, taxpayers need to receive equal care, love, consideration and equal distribution of income by government before they engage in voluntary tax compliance tax compliance.

### 3. Method and Model

Considering the nature of this study, a cross-sectional survey research design was used, because the data is collected at one point in time (Doreen, 2020). Equally, this study used survey because it entails going to the field and collecting the relevance and required data. The population of this study in these selected LGAs collectively encompass a micro enterprise population of approximately 205,418. The reason of selecting the three local government these LGAs represent the areas with the highest number of microenterprises in the state. state board of internal revenue (SBIR). The sample size of this study is 384 was selected from a total population of 205,418, based on the guidelines provided by Krejcie and Morgan (1970). Moreover, this study used stratified sampling; also, the study used questionnaires as a method of data collection. More also, interval scale was used because is appropriate for this study. Multiple and inferential regression analysis was used as techniques of data analysis with the help of SPSS.

#### Model Specification

This model was tested and thus transformed as follows:

Tax Compliance = (tax fairness, tax knowledge, probability of detection, trust in government and tax service quality)

$$TC = \beta_0 + \beta_1 TF_i + \beta_2 TK_i + \beta_3 PD_i + \beta_4 TG_i + \beta_5 TSQ_i + \epsilon \dots \dots \dots (1)$$

Where:

TC= Tax Compliance,  $\beta_0$  = Constant Coefficient,  $\beta_1$  = Coefficient, TF = Tax Fairness,

$\beta_2$  = Coefficient, TK = Tax Knowledge  $\beta_3$ = Coefficient, PD = Probability of detection

$\beta_4$  = Coefficient, TG= Trust in Government,  $\beta_5$  = Coefficient, TSQ = Tax Service quality,  $\epsilon$ = error term or standard error of estimated.

**Table 1:** Variable Definitions and Measurements

Variables	Definition	Measurement	Source
Tax Compliance	The extent to which taxpayers accurately, timely, and voluntarily file tax returns and pay taxes as required by law	Timely filing of tax returns, report	Ibrahim et al. (2025); Olumoh (2024)
Tax Fairness	The extent to which taxpayers perceive the tax system, rates, and enforcement processes as equitable and just	Perceived fairness of tax service, tax rate	Yau (2017); Rohim & Tjaraka, (2025)

Tax Knowledge	The level of awareness, understanding, and familiarity taxpayers have regarding tax laws, obligations, filing procedures, and penalties.	Awareness of tax laws	Ellawule et al. (2024); Njihia et al. (2025)
Probability of Detection	The perceived likelihood that tax authorities will detect non-compliance, evasion, or under-reporting.	Likelihood of detection during audits	Kirwa (2024)
Trust in Government	The degree to which taxpayers believe that the government uses tax revenues responsibly, transparently, and for public benefit.	Trust in government spending, policy	Tsikas (2017); Hayati et al. (2025)
Tax Service Quality	The perceived quality of services provided by tax authorities, including responsiveness, clarity, accessibility, and professionalism.	Clarity of tax information,	Susuawu et al. (2020)

Source: Author’s Analysis, 2025.

#### 4. Result and Discussion

##### Multicollinearity Test

**Table 2:** Test of Multicollinearity

Independent Variables	Collinearity	
	Tolerance	VIF
Tax fairness	.790	1.266
Tax Knowledge	.916	1.091
Probability of detection	.945	1.058
Trust in Government	.921	1.086
Tax Service Quality	.708	1.412

Source: Author’s Analysis, 2025.

In this study, Variance Inflation Factor (VIF) and tolerance level of the independent variables were computed and examined through the use of regression to test the presence of multicollinearity. when VIF and tolerance level values exceed 10 and 0.10 respectively, it indicates the presence of multicollinearity. However, Table 4 shows that none of the values for tolerance and VIF exceeds these thresholds. Based on this, the issue of multicollinearity does not exist among the independent variables.

##### Correlation Matrix

**Table 3:** Person’s Correlation between the Study Variables

Variable	TC	TF	TK	PD	TG	TSQ
Tax Compliance	1					
Tax Fairness	.129	1				
Tax Knowledge	.447	.174	1			
Probability of Detection	.340	-.089	.063	1		
Trust in Government	.210	.149	.121	.013	1	
Tax Service Quality	.521	.426	.277	.155	.275	1

Source: Author’s Analysis, 2025.

Table 3 demonstrates the correlation matrix among the exogenous and endogenous latent construct and the result shows that no multicollinearity exist as all the independent variables scores are less than the cut-off values of 0.9 (Hair et al., 2016). In addition, these findings have affirmed the test of Variance Inflation Factor that was conducted to check multicollinearity. Accordingly, Ramayah et al. (2018) the data will be free of multicollinearity when the value of VIF is less than 10.

### Multiple Regression Analysis and Hypothesis Testing

**Table 4: Multiple Regression Results**

Predictor	B	SE	t	P	Tolerance	VIF
(Constant)	5.224	1.970	2.652	.008	-	-
TF	-0.110	0.048	-2.298	.022	.790	1.266
TK	0.336	0.046	7.345	.000	.916	1.019
PD	0.159	0.050	3.189	.002	.945	1.058
TG	0.071	0.049	1.452	.147	.921	1.086
TSQ	0.365	0.043	8.758	.000	.708	1.412
R				0.639		
R <sup>2</sup>				0.408		
Adjusted R <sup>2</sup>				0.399		
F (5, df)				44.354		
P				< .001		

**Source:** Author’s Analysis, 2025.

Table 4 of this study. Firstly, the result has expressed the regression equation with predictors that are significant with the following result: R= 0.639, R<sup>2</sup>= 0.408, Adj. R<sup>2</sup>= 0.399, F-Change=44.354. It can also be observed that the correlation coefficients between the endogenous variable (tax compliance) and the five exogenous variables (between Tax Fairness, Tax Knowledge, Probability of Detection, Trust in Government, Tax Service Quality) is 0.639 together with predictors that accounts for 40.8% of variance in tax compliance. Cohen (1988) classified R<sup>2</sup> into 3 orders as follows: 0.02 as weak, 0.13 as moderate and 0.26 as substantial. Going by this classification, the value of R<sup>2</sup> in the regression result is substantial. Furthermore, the significance of F-test (44.354, p=0.000) confirmed the overall prediction of the independent variables to the dependent variable.

Accordingly, the best way to assess the regression model is to look at the contribution of each of the predictors on the dependent variable. Table 3 reveals that tax service quality is the best predictor that predicts the tax compliance with this result ( $\beta=0.365$ ,  $t=8.758$ ). The next predictor in order of significance is tax knowledge ( $\beta=0.336$ ,  $t=7.345$ ). Also, the next predictor in order of significance is probability of detection ( $\beta=0.159$ ,  $t=3.189$ ), More also, tax fairness is negative but significant ( $\beta= -0.110$ ,  $t= -2.298$ ), However, trust in Government ( $\beta=0.071$ ,  $t=1.452$ ). Is not significantly related to tax compliance in Nigeria. Concisely, four out of the five predictors have significant influence on the tax compliance on the hypotheses of this study. Therefore, this result implies that the tax compliance of the personal income determinant is greatly determined by its tax service quality, tax knowledge, probability of detection, tax fairness and hence, H1, H2 H3 and H5 are rejected while H4 is supported.

### Discussion of findings

### **Tax fairness and Tax Compliance**

The negative but significant result at ( $\beta = -0.110$ ,  $t = -2.298$ ,  $\beta = 0.196$ ,  $p = 0.022$ ). Suggests that fairness in this study context may be perceived as unbalanced or symbolic rather than practical, which reduces compliance rather than promoting it. This is academically valuable because it shows that fairness perceptions do not always lead to higher compliance their effect depends on how fairness is understood and experienced in the real tax environment. Therefore, negative but significant outcome demonstrates that fairness acts as both a motivator and a compliance driver, reinforcing the importance of equity in taxation policy. The result is consistent with finding of (Mahdi et al. 2020) However, the finding is not in agreement with the work Debebe (2021), Jolodar et al. (2019), and Faizal and Palil (2019).

### **Tax Knowledge and Tax Compliance**

Tax knowledge in the field of taxation refers to the awareness, understanding, and ability of individuals or businesses to correctly interpret and apply tax laws, rules, and procedures in fulfilling their tax obligations. Therefore, hypothesis was put forward and tested; it was predicted that Tax knowledge has no significant effect tax compliance among micro enterprises in Taraba states. Contrary to the predicted hypothesis, the result showed that Tax knowledge have significant positive effect with tax compliance. This result is consistent with the finding of Muhammad et al. (2023), Hamid et al. (2020), and Aremu and Siyanbola (2021) found that tax knowledge has a positive effect between tax knowledge and tax compliance.

### **Probability of Detection and Tax Compliance**

Therefore, hypothesis was put forward and tested; it was predicted that Probability of detection has no significant effect on tax compliance among micro enterprises in Taraba states. Contrary to the predicted hypothesis, the result showed that probability of detection have significant positive effect/relationship with tax compliance in Nigeria. The result of this study corroborates with the findings of Perabavathi et al. (2017); Ya'u et al. (2020) among others. These studies have confirmed that probability of detection have significant positive relation with tax compliance in different domains. On the other hand, the finding contradicts the result of Areo et al. (2020); Deyganto (2018) and Nguyen et al. (2020) in terms of direction where they found that probability of detection have negative relationship with tax compliance. This result implies that probability of detection being positive and significant at  $p = 0.002$  means that the likelihood of taxpayers complying with tax obligations increases when they perceive a higher chance of being caught and penalized for noncompliance.

### **Trust in Government and Tax Compliance**

Therefore, a hypothesis was put forward and tested; it was predicted that Trust in government has no significant effect on tax compliance among micro enterprises in Taraba states. Expertdily, the result indicated that trust in government is insignificant relationship with tax compliance. This result is consistent with the finding of Sulistyowati et al. (2024) and Henry et al. (2023). Widuri and Irawan (2019) found that trust in government has a negative insignificants and no relationship with tax compliance among SMEs. But contradict the findings of Saddaf et al. (2022) and Appiah and Aganaba (2024). Alshira'h (2024) found that trust in government and attitude have a positive and significant impact on tax compliance.

Based on the findings Trust in government result being insignificant at  $p = 0.147$  means that taxpayers' perception of trust in government does not have a statistically meaningful effect on their compliance behavior in this study.

### **Tax Service Quality and Tax Compliance**

Therefore, a hypothesis was put forward and tested; it was predicted that Tax service quality has no significant effect on tax compliance among micro enterprises in Taraba states. But the result indicated that tax service quality have significant positive relationship with tax compliance. The finding is consistent with past studies that investigated a similar relationship in different contexts. The result is justified by finding of Khamis and Mastor (2021); Kazi (2021); Qisthi (2021); Kurniawan and Daito (2021) among others. These studies have confirmed that tax service quality have significant positive relation with tax compliance in different contexts and countries. On the other hand, the finding contradicts the result of Mukiyidin et al. (2021); Alkhatib and Abdul-jabbar (2019) in terms of direction where they found that tax service quality has significant negative relationship with tax compliance. However, the result of this study contradicts the finding of Ridhan et al. (2021); Lallo (2019) in terms of significance, which found that there is no relationship between tax service quality and tax compliance.

Tax service quality result being positive and significant at  $p = 0.000$  means that the quality of services provided by tax authorities strongly and positively influences taxpayer compliance.

### **5. Conclusion and Recommendation**

The study concludes that strengthening taxpayer education, improving service delivery, enhancing enforcement, and revising fairness-related aspects of tax policy are key to improving compliance among micro enterprises. Therefore, the study recommends that tax authorities in Taraba State prioritize continuous taxpayer education to enhance tax knowledge among micro enterprises, while also strengthening enforcement measures such as audits and sanctions to increase the probability of detection and discourage evasion. Improving the quality of tax services through transparency, efficiency, and the use of modern technology is equally essential to encourage voluntary compliance. Furthermore, the fairness of the tax system should be addressed by simplifying tax rates, ensuring equity across taxpayers, and linking revenues to visible public services. Finally, rebuilding trust in government requires greater accountability, anti-corruption initiatives, and effective utilization of tax revenue in ways that directly benefit taxpayers.

Practically, the findings of this study carry important practical implications for tax administration and policy implementation in Taraba State, particularly in relation to micro enterprises. First, the positive and significant effect of tax knowledge suggests that improving taxpayer education is a key strategy for enhancing compliance. Theoretically, the present study empirically investigates the determinants of personal income tax and tax compliance in Nigeria. This study provides valuable theoretical implications by testing the relevance of deterrence theory, fiscal exchange theory, and equity theory in explaining tax compliance.

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## **CREDIT RISK FACTORS AND FIRM VALUE OF DEPOSIT MONEY BANKS IN NIGERIA**

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### **Abstract**

*This study examines the effect of credit risk factors on firm value among listed Deposit Money Banks (DMBs) in Nigeria using an eleven-year panel dataset (2013–2023). Employing a Panel Generalized Least Squares (PGLS) model to address heteroskedasticity and serial correlation, the findings reveal that the Trade Receivables Composite Quality Index (TRCQI) significantly and negatively impacts firm value, while Receivables Turnover (RT) and Cash Holdings (CH) also exhibit significant negative effects. In contrast, the Non-Performing Loan Ratio (NPLR) and Loan Loss Provisions (LLP) show insignificant effects. The results underscore the importance of maintaining high-quality receivables, balanced credit recovery practices, and optimized liquidity management to enhance market valuation. The study recommends rigorous credit risk assessment, proactive monitoring of loans, forward-looking provisioning, customer-focused receivables management, and strategic liquidity deployment to strengthen shareholder value and overall bank performance.*

**Keywords:** Credit Risk, Firm Value, Receivables Turnover, Non-Performing Loans, Liquidity Management

### **1. Introduction**

The performance and sustainability of financial institutions are increasingly assessed not only through traditional accounting indicators such as profitability and earnings per share but also via market-based measures of firm value, including market capitalization, Tobin's Q, and economic value added (Achema, 2023). Firm value reflects investors' collective assessment of a company's ability to generate future cash flows, manage risks, and allocate resources efficiently (Niskanen & Niskanen, 2023). In Nigeria, sustaining firm value is critical for Deposit Money Banks (DMBs), which operate in an environment characterized by exchange rate volatility, persistent inflation, regulatory transitions, and elevated credit risk exposures (Olaoye & Fajuyagbe, 2020). Credit quality, capturing the likelihood of loan default, is a central determinant of firm value and is measured through indicators such as the non-performing loan (NPL) ratio, loan-to-deposit ratio (LDR), capital adequacy ratio (CAR), and trade receivables relative to total assets (Issackow et al., 2021). Poor credit quality increases provisioning costs, reduces profitability, and erodes investor confidence (Sanusi, 2012).

Trade receivables constitute a significant portion of banks' credit exposure and underpin liquidity, asset performance, and revenue stability. Globally, firms allocate substantial resources to receivables—about 11.9% of total assets in the U.S. with trade

credit representing over 21% of U.S. GDP, highlighting its systemic importance (Goncalves, 2016). In Nigeria, receivables embedded in various loan instruments influence banks' risk profiles and valuation outcomes (Tuoyo, 2023; Okoh et al., 2025). Their strategic role intensified during the COVID-19 pandemic, when restricted access to formal credit increased reliance on trade credit worldwide (Isibor & Giwa-Osagie, 2024), a trend also evident among Nigerian firms seeking liquidity (Uwuigbe et al., 2022), though elevated receivables increased credit risk during economic downturns (Okoye et al., 2020; Nworie et al., 2023).

Cash holdings further influence firm value by providing liquidity buffers that mitigate shocks and support long-term value creation (Confidence & Igoniderigha, 2023). Excessive cash reserves, however, may indicate inefficiencies or weak investment prospects, potentially reducing firm value (Maccarthy & Jibrin, 2023). The interaction between receivables quality and cash holdings is complex: poor credit quality may necessitate higher precautionary liquidity, while efficient receivables turnover can reduce cash requirements (Acharya et al., 2012). Despite their interconnectedness, studies often examine credit risk (Adiguzel, 2021) and liquidity separately (Ademokoya et al., 2020; Isibor & Giwa-Osagie, 2024), providing limited insight into their joint effects on firm value.

In Nigeria, systemic vulnerabilities persist despite reforms following the 2008–2009 banking crisis (Sanusi, 2012; Central Bank of Nigeria [CBN], 2018). Recent assessments report elevated NPL ratios and pressure on profitability, with the average NPL rising to 6.3% in 2022, above the prudential benchmark of 5% (CBN, 2022; Okoh et al., 2025). Many banks maintain liquidity buffers above regulatory minima, suggesting potential inefficiencies in capital deployment. Existing evidence remains theoretically fragmented—drawing from agency theory (Jensen & Meckling, 1976; Mustapha & Adejuwon, 2025), trade-off theory (Kraus & Litzenberger, 1973; Nworie et al., 2023), and pecking order theory (Myers & Majluf, 1984; Okwoli et al., 2022) with methodological limitations including short timeframes and absence of integrated models jointly examining receivables quality and cash holdings.

To address these gaps, this study investigates the influence of trade receivables credit quality and cash holdings on firm value in Nigerian DMBs. It examines trade receivables credit quality, NPL ratios, receivables turnover, and loan loss provisions, alongside cash holdings, focusing on DMBs listed on the Nigerian Exchange Group between 2013 and 2023, capturing significant economic, regulatory, and institutional shifts. This scope provides a robust foundation to understand how evolving credit and liquidity dynamics jointly shape firm value in Nigeria's banking sector.

## **2. Literature Review**

### **2.1 Conceptual Review**

#### **2.1.1 Firm Value**

Firm value reflects a company's overall worth, integrating financial health, operational efficiency, and long-term sustainability (Brigham & Daves, 2019; Arhinful et al., 2025). For deposit money banks (DMBs), it combines accounting measures like return on assets and equity with market-based indicators such as Tobin's Q and market capitalization (Ofoegbu & Megbuluba, 2016; Etim et al., 2022; Tuoyo et al., 2023). Effective credit risk management, low non-performing loans, and disciplined receivables enhance value by signaling governance quality (Olabisi et al., 2019; Appah, 2023), while optimal liquidity and strong governance promote investor

confidence (Medo-Uwa, 2019; Bencharles & Nwankwo, 2021; Oranefo & Ezu, 2023). Firm-specific factors further support efficiency and sustainability (Aduwo & Aduwo, 2023; Mshelia & Polycarp, 2024).

### **2.1.2 Credit Quality of Trade Receivables**

Trade receivables credit quality (TRCQ) in the banking sector reflects the extent to which loans and advances are collectible in full and on time, serving as a core indicator of asset quality and credit risk exposure. High TRCQ signals effective credit appraisal and monitoring, whereas deterioration indicates heightened default risk and reduced earnings predictability (Alhassan & Islam, 2021; Adiguzel, 2021). In empirical literature, TRCQ is often measured through a composite Trade Receivables Quality Indicator (TRQI), incorporating the NPL ratio, receivables turnover, loan loss provisioning trends, profitability, and credit growth dynamics (Melumad & Nissim, 2009; Olaoye & Fajuyagbe, 2020). The NPL ratio captures impaired credit exposures (Atanasova, 2012), turnover reflects collection efficiency (Ayunku & Uzochukwu, 2020), and loan loss provisions indicate anticipated credit losses. Secondary indicators such as ROA and aggressive loan expansion capture behavioral and performance dimensions of credit quality (Enwafor et al., 2021). Overall, TRCQ offers a comprehensive assessment of credit asset soundness and supports managerial and regulatory decision-making.

### **2.1.3 Non-Performing Loans Ratio**

The non-performing loan ratio represents the share of loans overdue for more than 90 days, serving as a key indicator of bank asset quality and credit risk (Jibril et al., 2021; CBN, 2022). Higher NPLR reflects deteriorating loan portfolios and increased default likelihood (Ozili, 2024). Empirical evidence reports mixed effects of NPLR on bank performance (Okoh et al., 2025; Arhinful et al., 2025).

### **2.1.4 Loan Loss Provisions (LLP)**

Loan loss provisions represent the estimated amount that banks set aside to absorb potential losses from loan defaults. They serve as a protective buffer against expected credit losses and closely relate to the non-performing loan ratio (Appah, 2023). When credit risk rises, banks typically increase provisions, which affects profitability and reported earnings (Tuoyo et al., 2023). Although LLP is essential for ensuring financial stability, it is also influenced by managerial discretion and can be used for earnings management (Mshelia & Polycarp, 2024). Empirical findings remain mixed: some studies report a positive effect of LLP on firm performance (Ngumbay, 2023), while others document negative relationships (Adiguzel, 2021; Aduwo & Aduwo, 2023).

### **2.1.5 Receivables Turnover (RT)**

Receivables turnover reflects how efficiently a bank collects its credit sales, computed as net credit sales divided by average receivables (Ngumbau, 2023). A higher ratio signals strong credit quality, while a lower ratio suggests collection weaknesses (Aliyu et al., 2024). RT complements ACP by capturing the operational dimension of credit risk management.

### **2.1.6 Cash Holdings**

Cash holdings represent a firm's most liquid assets, essential for meeting short-term obligations, supporting operations, and seizing investment opportunities (Medo-Uwa, 2019; Nnubia et al., 2020). In DMBs, cash levels are influenced by managerial decisions, risk tolerance, operational efficiency, macroeconomic conditions, and regulatory requirements (Jebran et al., 2019; Virginus, 2020; Ogundipe et al., 2022; Okoh et al., 2025). High precautionary cash mitigates liquidity risk from poor

receivables quality (Issackow et al., 2021; Dabai et al., 2023), though excessive holdings incur opportunity costs (Afolabi et al., 2023; Adegbite, 2024). Managerial behavior, financial constraints, and technological tools further shape liquidity strategies (Alao & Ifayemi, 2021; Ndu et al., 2024).

## **2.2 Empirical Review and Hypotheses Development**

### **2.2.1 Trade Receivables Credit Quality and Firm Value**

The empirical literature consistently underscores the importance of trade receivables credit quality (TRCQ) in shaping firm performance, liquidity, and overall value. Adiguzel (2021), using a dynamic panel and system GMM approach on U.S.-listed firms, found that deteriorating receivables quality proxied by rising average collection periods and migration into higher-risk categories prompted precautionary increases in cash holdings and a simultaneous decline in firm value. The study highlighted TRCQ as a leading indicator of operational inefficiency and value erosion, recommending rigorous credit monitoring and enforcement.

Jacobson and Schedvin (2015) reported that in Swedish banks and corporates, worsening credit quality increased the cost of capital, reduced earnings stability, and weakened firm value, particularly during economic downturns. Martínez-Sola et al. (2013) found an inverted U-shaped relationship between trade credit and firm value in Spanish firms, where moderate receivables enhanced value, but excessive credit constrained liquidity and reduced valuation. Similarly, Melumad and Nissim (2009) demonstrated that lower turnover and higher loan loss provisions in U.S. financial institutions significantly decreased firm value, confirming receivables quality as a strong predictor of cash flow reliability.

Other studies, including Asiedu (2019), Abuhommous and Almanaseer (2020), and Dabai et al. (2023), consistently show that efficient receivables management improves liquidity, investor confidence, and firm valuation. Based on this assertion, the following hypothesis is formulated:

**H<sub>01</sub>:** *Trade receivables credit quality has no significant effect on the firm value of listed Deposit Money Banks in Nigeria.*

### **2.2.2 Non-Performing Loan (NPL) Ratio and Firm Value**

Empirical evidence on the effect of non-performing loans (NPLs) on bank value is mixed. Aliyu et al. (2024) found that NPLs negatively affected the financial performance of Nigerian banks, though significance was not reported. Ngumbau (2023) observed a significant positive impact on Kenyan banks ( $\beta = 0.8240$ ;  $p < 0.05$ ), suggesting strong risk buffers. Bencharles and Nwankwo (2021) reported mixed, non-significant effects, emphasizing the importance of effective monitoring and loan recovery. Based on this assertion, the following hypothesis is formulated:

**H<sub>02</sub>:** *non-performing loan provisions has no significant effect on the firm value of listed Deposit Money Banks in Nigeria.*

### **2.2.3 Loan Loss Provisions and Firm Value**

Empirical studies on loan loss provisions (LLP) and firm value show mixed outcomes. Ngumbau (2023) found a positive but insignificant effect of LLP on Kenyan banks' firm value, highlighting its role in prudent risk management. Bencharles and Nwankwo (2021) reported a negative impact on ROA in Nigerian banks, though LLP to loans was positive but insignificant. Aliyu et al. (2024) observed that higher LLPs signaled anticipated credit losses, negatively affecting performance. Collectively, these studies underscore that LLP influences financial health and earnings quality,

depending on context and management practices. Based on this assertion, the following hypothesis is formulated:

**H<sub>03</sub>:** *loan loss provisions has no significant effect on the firm value of listed Deposit Money Banks in Nigeria.*

#### **2.2.4 Receivables Turnover and Firm Value**

Empirical evidence highlights the importance of receivables turnover (RT) for firm value in the banking sector. Hill et al. (2015) theorized that higher RT enhances asset efficiency, reduces credit risk, and supports valuation. Aliyu et al. (2024) found that higher RT mitigates the negative effects of NPLs and LLP on Nigerian banks' performance, emphasizing robust credit monitoring. Anetoh et al. (2021) reported that poor RT significantly reduces firm value, while strong operational controls improve it. Collectively, these studies underscore that efficient receivables management strengthens liquidity, earnings stability, and investor confidence, supporting firm value. Based on this assertion, the following hypothesis is formulated:

**H<sub>04</sub>:** *receivables turnover has no significant effect on the firm value of listed Deposit Money Banks in Nigeria.*

#### **2.2.5 Cash Holdings and Firm Value**

Empirical studies highlight the significant role of cash holdings in influencing firm value. Medo-Uwa (2019) found that optimal cash management enhances Nigerian DMB profitability by balancing liquidity and minimizing idle funds. Amahalu (2019) showed that firm size, growth opportunities, and market conditions shape cash holding decisions and performance. Nnubia et al. (2020) reported similar effects across African firms, while Umoru et al. (2023) linked liquidity and profitability to firm value. Habib et al. (2021) found a non-linear relationship internationally, and Hameed and Leah (2024) emphasized leveraging sales growth and profitability to optimize cash holdings. Based on this assertion, the following hypothesis is formulated:

**H<sub>05</sub>:** *cash holdings have no significant effect on the firm value of listed Deposit Money Banks in Nigeria.*

### **2.3 Theoretical Framework**

This study's theoretical framework is anchored in Agency Theory and Liquidity Preference Theory, explaining how trade receivables credit quality, cash holdings, and firm value interact in Nigerian deposit money banks (DMBs). Agency Theory (Jensen & Meckling, 1976) highlights conflicts from ownership–control separation, where managers may pursue personal goals such as relaxed lending standards, excessive cash accumulation, or short-term earnings manipulation, potentially increase non-performing loans and reduce firm value (Bencharles & Nwankwo, 2021; Oranefo & Ezu, 2023; Adedeji, 2021; Abdulai et al., 2020). Liquidity Preference Theory emphasizes maintaining liquid assets to absorb shocks while balancing profitability (Aduwo & Aduwo, 2023; Medo-Uwa, 2019; Amahalu, 2019; Mshelia & Polycarp, 2024). Together, these theories frame receivables quality and cash holdings as key determinants of firm value through managerial behavior, governance, and liquidity strategies (Mustapha & Adejuwon., 2025; Tuoyo et al., 2023).

## **3. Method and Model**

### **3.1 Research Design**

This study adopts a quantitative and deductive research design to examine the effect of credit risk factors on firm value among Nigerian Deposit Money Banks (DMBs). The research design is both descriptive and causal, covering the period 2013–2023 and

relying exclusively on secondary data obtained from published annual reports, financial statements, and the Nigerian Exchange Group (NGX).

### 3.2 Population of the Study

The population of the study consists of all thirteen (13) Deposit Money Banks listed on the Nigerian Exchange Group (NGX). These banks represent the entire publicly traded commercial banking sector in Nigeria and provide consistent published financial data needed for the study variables.

### 3.3 Sampling Techniques

A census sampling technique is employed due to the manageable population size and availability of complete data. This ensures the inclusion of all listed DMBs, providing comprehensive coverage, eliminating sampling error, and enhancing the generalisability of the findings.

### 3.4 Sample Size

The sample size consists of all thirteen (13) listed DMBs in Nigeria. Since a census approach is adopted, every bank within the population is included, provided complete data are available for the eleven-year period under review.

### 3.5 Method of Data Analysis

Data analysis was conducted using EViews, employing panel generalized regression techniques to assess the relationship between credit risk factors and firm value. Diagnostic tests including multicollinearity, heteroskedasticity, and autocorrelation were performed to validate model assumptions and ensure robustness. Descriptive statistics were also generated to summarize key variables, offering insights into central tendencies, variability, and overall data structure.

### 3.6 Model Specification

The study adapts the models of Melumad and Nissim (2009) and Adiguzel (2021) to examine the effect of trade receivables credit quality (TRCQ), cash holdings, and related variables on firm value (FV) of Nigerian deposit money banks. The primary model is specified as:

$$FV_{it} = \beta_0 + \beta_1 TRCQ_{it} + \beta_2 NPLR_{it} + \beta_3 LLP_{it} + \beta_4 RT_{it} + \beta_5 CH_{it} + \beta_6 TANG_{it} + \varepsilon$$

Where: FV = Firm value

TRCQI = Trade Receivables Credit Quality Index,

NPLR = Non-Performing Loan

LLP = Loan Loss Provisions

RT = Receivables Turnover

CH = Cash holdings, TANG = Non-current Assets divided by Total Asset

$\varepsilon$  = Error term;  $\beta_0$  = Intercept;  $\beta_1$ – $\beta_6$  = Coefficients of explanatory variables.

This specification captures both the direct and composite effects of credit risk factors on firm value.

### 3.7 Operationalization of Variables

**Table 1:** Variable Measurement and Source

Acronym	Variable	Type	Measurement by Prior Study	Source
FV	Firm Value	Dependent	Tobin's Q = (Total assets – Book value of equity + Market value of equity) ÷ Total assets	Adiguzel (2021)

TRCQI	Trade Receivables Credit Quality Index	Independent	$TRCQI = (NPL\ Ratio \times Receivables\ Turnover) \times LLP\ Trend \times ROA\ Trend \times Loan\ Growth$	Adiguzel (2021)
LLP	Loan Loss Provision	Independent	Ratio of loan loss provisions to total loans	Achema et al. (2022)
NPLR	Non-Performing Loan Ratio	Independent	Ratio of Non-Performing Loans to Total Loans	Aliyu et al. (2024)
RT	Receivables Turnover	Independent	Total Loans ÷ Total Assets	Aliyu et al. (2024)
CH	Cash Holdings	Independent	Cash and Cash Equivalents ÷ Total Assets	Hameed & Leah (2024)
TANG	Tangibility	Control	Non-Current Assets ÷ Total Assets	Jebran et al. (2019)

Source: Researcher’s compilation (2025)

## 4. Results and Discussion

### 4.1 Descriptive Statistics

Table 2: Descriptive Statistics

	FV	TRCQI	NPLR	LLP	RT	CH	TANG
Mean	1.0221	0.0000	0.0803	0.0168	1.3808	1.4859	0.7763
Median	1.0151	0.0000	0.0800	0.0130	0.9757	1.4548	0.8425
Maximum	1.3839	0.0047	0.1700	0.0982	12.2729	3.7550	2.1677
Minimum	0.5902	(0.0003)	0.0230	0.0065	0.2980	0.0834	0.0005
Std. Dev.	0.0667	0.0004	0.0299	0.0159	1.5031	0.7594	0.2856
Skewness	(0.2599)	11.6299	0.4562	3.5266	4.2347	0.4355	0.3724
Kurtosis	21.9730	137.9249	3.5854	15.1758	25.5086	3.2314	10.7814
Jarque-Bera	2,146.4520	111,693.4000	7.0022	1,179.7270	3,446.1010	4.8386	364.0849
Probability	0.0000	0.0000	0.0302	0.0000	0.0000	0.0890	0.0000
Observations	143	143	143	143	143	143	143

Source: Researchers’ Compilation (2025)

The descriptive statistics for 143 firm-year observations reveal considerable variability across the variables. Firm Value (FV, Tobin’s Q) has a mean of 1.0221, SD = 0.0667, negatively skewed (−0.2599) and leptokurtic (21.97), JB = 2,146.45 ( $p < 0.01$ ), indicating outliers. TRCQI shows extreme skewness (11.63) and kurtosis (137.92), JB = 111,693.40 ( $p < 0.01$ ), reflecting heterogeneous receivables credit quality. NPLR (mean = 0.0803, SD = 0.0299, skew = 0.4562, kurtosis = 3.59, JB = 7.00,  $p = 0.0302$ ) and CH (mean = 1.4859, SD = 0.7594, skew = 0.4355, kurtosis = 3.23, JB = 4.84,  $p = 0.0890$ ) are approximately normal. LLP (mean = 0.0168, SD = 0.0159, skew = 3.53, kurtosis = 15.18, JB = 1,179.73,  $p < 0.01$ ), RT (mean = 1.3808, SD = 1.5031, skew = 4.23, kurtosis = 25.51, JB = 3,446.10,  $p < 0.01$ ), and TANG (mean = 0.7763, SD = 0.2856, skew = 0.3724, kurtosis = 10.78, JB = 364.08,  $p < 0.01$ ) exhibit high skewness and leptokurtosis, suggesting outliers. These patterns justify using robust regression techniques to address heterogeneity and non-normality.

### 4.2 Correlation Analysis

Table 2: Correlation Matrix

	FV	TRCQI	NPLR	LLP	RT	CH	TANG
FV	1.0000						
TRCQI	-0.0888	1.0000					
NPLR	-0.1057	0.0939	1.0000				
LLP	-0.0748	-0.0286	-0.3419	1.0000			

<b>RT</b>	-0.1221	-0.0385	0.2855	-0.1742	1.0000		
<b>CH</b>	-0.0554	-0.1493	0.2086	-0.2567	0.1280	1.0000	
<b>TANG</b>	-0.0129	0.0665	0.2232	0.0359	-0.1078	0.1814	1.0000
<b>FAGE</b>	-0.1539	-0.1002	0.0645	0.2801	-0.2004	-0.0028	-0.1380

**Source:** Researchers' Compilation (2025)

Table 2 shows weak negative correlations between the explanatory variables and firm value, with no evidence of multicollinearity as all coefficients remain low. Trade receivables credit quality ( $r = -0.0888$ ), NPLR ( $r = -0.1057$ ), LLP ( $r = -0.0748$ ), RT ( $r = -0.1221$ ), CH ( $r = -0.0554$ ), and TANG ( $r = -0.0129$ ) all exhibit mild inverse associations. Overall, correlations are weak, indicating limited linear influence on firm value.

### 4.3 Diagnostic Tests of the Regression Model

**Table 3:** Diagnostic Test Estimates

Variance Inflation Factors		Breusch-Godfrey Serial Correlation LM Test:	
Variable	Centered (VIF)	F-statistic	Obs*R-squared
<b>C</b>	NA	12.59997	22.77872
<b>TRCQI</b>	1.0625	Prob. F(2,133)	Prob. Chi-Square(2)
<b>NPLR</b>	1.4593	0.0000	0.0000
<b>LLP</b>	1.3931	<b>Heteroskedasticity Test: ARCH</b>	
<b>RT</b>	1.2369	<b>F-statistic</b>	<b>Obs*R-squared</b>
<b>CH</b>	1.1824	3.796643	3.749207
<b>TANG</b>	1.2347	Prob. F(1,140)	Prob. Chi-Square(1)

**Source:** Researcher's Computation (2025)

Diagnostic tests were conducted to ensure the reliability of the regression results. VIF values for all variables—TRCQI (1.0625), NPLR (1.4593), LLP (1.3931), RT (1.2369), CH (1.1824), and TANG (1.2347) were below 10, indicating no multicollinearity. However, the Breusch-Godfrey test confirmed serial correlation ( $p = 0.0000$ ), and the ARCH test revealed heteroskedasticity ( $p \approx 0.04$ ). Since OLS assumptions were violated, the study employed Panel GLS, which corrects for both issues and improves estimate efficiency.

### 4.4 Regression Results

**Table 4:** Panel Generalized Least Squares Regression Estimates

Dependent Variable: FV				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>C</b>	1.0180	0.0165	61.6160	0.0000
<b>TRCQI</b>	-16.8114	5.4671	-3.0750	0.0026
<b>NPLR</b>	-0.0206	0.0420	-0.4902	0.6248
<b>LLP</b>	0.0591	0.1400	0.4220	0.6738
<b>RT</b>	-0.0097	0.0022	-4.4772	0.0000
<b>CH</b>	-0.0052	0.0018	-2.9444	0.0039
<b>TANG</b>	-0.0145	0.0040	-3.6768	0.0004
<b>R-squared</b>	0.7032	<b>F-statistic</b>	15.3396	
<b>Adjusted R-squared</b>	0.6574	<b>Prob(F-statistic)</b>	0.0000	
<b>S.E. of regression</b>	0.0533	Durbin-Watson stat	1.9200	

**Source:** Researcher's computation (2025)

The Durbin-Watson value of 1.9200 indicates no significant autocorrelation, supporting model reliability. The PGLS results show the model is highly significant ( $F = 15.3396$ ,  $p = 0.0000$ ), with strong explanatory power ( $R^2 = 0.7032$ ;  $\text{Adj. } R^2 = 0.6574$ ). The intercept is positive and significant ( $\beta = 1.0180$ ), confirming a high baseline firm value independent of the explanatory variables.

#### **4.5 Test of Hypotheses**

The results of the Panel Generalized Least Squares (PGLS) regression reveal varied and insightful effects of trade receivables credit quality indicators and cash holdings on the firm value of listed Deposit Money Banks in Nigeria, underscoring the financial and operational dynamics within the sector.

Trade Receivables Composite Quality Index (TRCQI) has a negative and statistically significant effect on firm value ( $\beta = -16.8114$ ;  $p = 0.0026$ ), indicating that poor receivables quality—potentially stemming from weak credit policies or ineffective collection strategies—significantly reduces firm value.

Non-Performing Loan Ratio (NPLR) has a negative and statistically insignificant effect on firm value ( $\beta = -0.0206$ ;  $p = 0.6248$ ), suggesting that changes in the proportion of non-performing loans are not strong predictors of market valuation, possibly due to risk mitigation measures or regulatory expectations.

Loan Loss Provision (LLP) has a positive and statistically insignificant effect on firm value ( $\beta = 0.0591$ ;  $p = 0.6738$ ), implying that although provisioning may reflect prudent risk management, it does not significantly affect investor perception or valuation outcomes.

Receivables Turnover (RT) exhibits a negative and statistically significant effect on firm value ( $\beta = -0.0097$ ;  $p = 0.0000$ ), which may suggest that an aggressive or overly stringent credit collection approach could adversely affect customer relations or revenue streams, thereby diminishing firm value.

Cash Holdings (CH) also show a negative and statistically significant effect on firm value ( $\beta = -0.0052$ ;  $p = 0.0039$ ), indicating that excess liquidity may be interpreted by investors as inefficient capital utilization, thereby exerting downward pressure on firm valuation.

These findings highlight the complex relationship between trade receivables credit quality, cash holdings, and firm valuation, emphasizing the need for banks to adopt balanced and strategic asset management practices that align with investor expectations and long-term value creation.

#### **4.6 Discussion of Findings**

This section summarises how trade receivables credit quality, non-performing loans, loan loss provision, receivables turnover, and cash holdings influence firm value, using empirical evidence and Agency and Liquidity Preference theories.

The study finds that TRCQI negatively and significantly affects firm value, indicating that declining receivables quality reduces valuation. This aligns with Adiguzel (2021) and Jacobson and Schedvin (2015), consistent with Agency Theory and Liquidity Preference Theory.

The result shows that NPLR negatively but insignificantly affects firm value. Evidence from Bencharles and Nwankwo (2021), Aliyu et al. (2024), and Ngumbau (2023) reveals mixed outcomes, reflecting governance and monitoring differences highlighted by Agency Theory.

The analysis indicates that LLP has a positive but insignificant effect on firm value. Findings by Ngumbau (2023) and Aliyu et al. (2024) support this, with Agency Theory and liquidity arguments suggesting earnings smoothing and tied-up resources.

The findings reveal that RT has a negative and significant effect on firm value. This aligns with Anetoh et al. (2021), contrasting Hill et al. (2015), and reflects managerial trade-offs and liquidity concerns explained by Agency and Liquidity Preference theories.

The study confirms that CH negatively and significantly affects firm value. Habib et al. (2021) and Hameed and Leah (2024) support this value-reducing effect, consistent with Agency concerns about inefficiency and Liquidity Preference Theory's emphasis on optimal liquidity.

## **5. Conclusion and Recommendations**

This study examined the effect of trade receivables credit quality and cash holdings on firm value among listed Deposit Money Banks in Nigeria using an eleven-year panel dataset (2013–2023) and a Panel GLS model to enhance estimate precision. The results show that the Trade Receivables Composite Quality Index (TRCQI) significantly and negatively affects firm value, indicating that declining receivables quality reduces market valuation. The Non-Performing Loan Ratio (NPLR) and Loan Loss Provisions (LLP) exhibit insignificant effects, suggesting limited valuation sensitivity to isolated credit-risk changes. Receivables Turnover (RT) shows a significant negative impact, implying that overly aggressive recovery practices may harm long-term value. Cash Holdings (CH) also significantly reduce firm value, reflecting investor concerns about inefficient liquidity management. Overall, the study highlights the importance of maintaining high-quality receivables and optimizing liquidity to enhance shareholder value, recommending strategic credit oversight and prudent cash deployment for improved firm performance.

The study highlights the following recommendation:

- i. Adopt rigorous credit risk assessment frameworks, enforce strict credit approval procedures, implement efficient collection systems, invest in credit-monitoring technologies, and continuously train credit personnel to sustain receivables performance and improve asset quality.
- ii. Intensify credit monitoring, improve borrower assessment, utilize early warning systems, conduct regular loan portfolio evaluations, and enhance recovery efforts through legal recourse, asset restructuring, and collaboration with credit bureaus.
- iii. Implement forward-looking, predictive models for expected credit losses in line with IFRS 9, maintain transparent and consistent provisioning policies, and align with global risk governance standards to safeguard financial soundness and boost investor confidence.
- iv. Avoid overly aggressive collections, employ client segmentation, optimize credit terms, use technology-driven collection processes, and maintain clear communication and flexible repayment arrangements to preserve long-term customer trust.
- v. Align cash reserves with operational needs and strategic objectives, allocate resources to value-generating activities, conduct regular cash flow assessments, and integrate investment planning to improve capital efficiency and demonstrate responsible financial stewardship.

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## EFFECT OF WHISTLEBLOWING PROGRAM AND PROBITY AUDIT ON FRAUD DETECTION IN NIGERIA PUBLIC SECTOR: A STUDY OF ICPC AND EFCC

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### Abstract

*Fraud persists as an enduring challenge within Nigeria's public sector, despite the implementation of various anti-fraud mechanisms. This research investigates the effect of whistleblowing programs and probity audits in improving the efficacy of fraud detection systems. The primary objective was to investigate the extent to which these factors contribute to identifying and addressing fraudulent activities within key institutions, specifically the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and Other Related Offences Commission (ICPC). A quantitative research design was adopted, employing a structured questionnaire administered to 480 respondents from these institutions. Data were analyzed using descriptive and inferential statistical techniques. The findings indicate that whistleblowing programs exert the strongest influence on fraud detection, underscoring the critical importance of well-implemented and accessible whistleblowing mechanisms in exposing fraudulent activities. Additionally, probity audits were found to play a vital role in uncovering and preventing fraud, emphasizing the necessity of regular, independent, and thorough audits to ensure accountability and transparency. Based on these findings, the study recommends that public sector institutions enhance whistleblowing frameworks by ensuring accessibility, anonymity, and whistleblower protection. It further advocates for the rigorous and independent execution of probity audits, with a commitment to implementing audit recommendations. These measures are essential for strengthening governance, transparency, and accountability within Nigeria's public sector.*

**Keywords:** Whistleblowing Program, Probity Audit, Fraud Detection and Public Sector

### 1. Introduction

Whistleblowing programs and probity audits have developed into essential tools for fighting fraud and promoting transparency across public and private organizations worldwide. Whistleblowing programs provide channels for individuals to report unethical conduct, typically offering legal safeguards and occasionally monetary rewards. These initiatives have demonstrated their value in exposing instances of fraud, corruption, and other misconduct that might otherwise remain concealed. Probity audits, meanwhile, constitute thorough assessments of adherence to ethical standards and protocols, with an emphasis on maintaining integrity and accountability in organizational operations. Collectively, these instruments function as strong deterrents against fraudulent behaviour (Syamsuddin et al., 2023).

The global landscape of whistleblowing program implementation shows mixed results. In the United States, the Sarbanes-Oxley Act of 2002 formalized whistleblowing mechanisms, contributing to notable enhancements in corporate governance practices and fraud detection capabilities. In a similar vein, the European Union introduced the Whistleblowing Directive in 2019, which sought to establish a harmonized approach

to whistleblower protection throughout its member states (Vian et al., 2022). Probity audits, play a crucial role in ensuring the integrity of public sector processes, particularly in procurement and contracting. These audits assess whether decision-making processes adhere to ethical standards and legal requirements, thereby reducing the risk of fraud and corruption. Probity audits have also gained traction, particularly in Australia and the United Kingdom, where they are integral to public procurement processes, ensuring that public resources are utilized effectively and ethically. Specifically, Australia and New Zealand have been at the forefront of implementing probity audits in their public sectors, with positive results in terms of improved governance and reduced instances of misconduct (Barrett, 2016).

In Nigeria, the adoption of whistleblowing programs and probity audits has become increasingly important in addressing rampant corruption and fraud within the public sector. The Nigerian government launched its whistleblowing program in 2016, which led to the recovery of significant sums of money. According to Okafor et al., (2020) and Nigerian Ministry of Finance, close to \$400 billion was stolen from Nigeria's public accounts from 1960 to 1999 and over ₦594.09 billion in stolen funds and assets between 2016 and 2019 was recovered within the first two years of the program's implementation as a result of whistleblowing tips (Olaleye, 2020). This success highlights the potential impact of whistleblowing in promoting transparency and accountability in Nigeria's public sector. Probity audits in Nigeria, while not as widely publicized as the whistleblowing program, have also shown improvement. The Office of the Auditor-General for the Federation has been working to strengthen its audit capabilities, including the introduction of probity audits to assess the integrity of public procurement processes (Office of the Auditor-General for the Federation, 2018). These audits focus on scrutinizing public procurement and other government expenditures to ensure compliance with established ethical standards. For instance, the Bureau of Public Procurement in Nigeria has been instrumental in conducting probity audits that have uncovered several instances of financial mismanagement and procurement fraud. Such efforts are crucial in a country where corruption has long been a significant impediment to development. However, the effectiveness of these initiatives in Nigeria has been hampered by challenges such as inadequate legal frameworks, limited resources, and cultural barriers to reporting misconduct.

Fraud detection globally has evolved with the advancement of technology and the implementation of robust governance frameworks. Countries with stringent anti-fraud measures, such as Sweden and New Zealand, consistently rank high in global transparency indices. These nations employ a combination of whistleblowing programs, probity audits, and strong legal frameworks to detect and prevent fraud. Conversely, countries with weaker governance structures often struggle with pervasive fraud and corruption, highlighting the importance of these mechanisms. Countries with stringent anti-fraud measures, such as Sweden and New Zealand, have consistently ranked high in global transparency indices. Sweden, for instance, ranked 3rd in the 2020 Corruption Perceptions Index (Transparency International, 2023). The Swedish National Audit Office plays a crucial role in maintaining this high standard through comprehensive audits and investigations. Similarly, New Zealand, ranking 2nd in the same index, has established a robust framework for fraud prevention and detection, including a well-implemented Protected Disclosures Act that encourages and protects whistleblowers (Transparency International, 2023). This framework is further strengthened by the efforts of the Office of the Auditor-General, which conducts regular audits and evaluations to ensure integrity and accountability in public sector

operations.

In the case of Nigeria, the country has made efforts to improve its fraud detection capabilities, but significant challenges remain. In light of these challenges, the Nigerian government has implemented various measures to combat fraud and enhance transparency in the public sector. Notable among these are the establishment of anti-corruption agencies such as the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and Other Related Offences Commission (ICPC). Additionally, the government introduced a Whistleblowing Policy in 2016 and has been working to strengthen probity audit processes within public institutions (Federal Ministry of Finance, 2016).

Despite these efforts, the problem of fraud in Nigeria's public sector persists. The effectiveness of anti-corruption measures has been limited, with many high-profile cases of fraud remaining unresolved. For instance, between 2018 and 2020, the EFCC reported recovering only ₦512 billion (approximately \$1.37 billion) in stolen assets, a fraction of the estimated losses to corruption (EFCC, 2021). This figure, while significant, pales in comparison to the scale of fraud believed to be occurring in the public sector. The consequences of this persistent fraud are severe and far-reaching. It hampers economic development, deprives citizens of essential services, and undermines the legitimacy of government institutions. The World Bank estimates that corruption in Nigeria's public sector costs the country roughly 1% of GDP growth annually. Moreover, the prevalence of fraud discourages foreign investment, with Nigeria ranking 131<sup>st</sup> out of 190 economies in the World Bank's Ease of Doing Business index for 2020 (World Bank, 2020).

Given the critical role of a transparent and accountable public sector in driving national development, addressing the issue of fraud detection in Nigeria's public sector is of paramount importance. The continued underperformance of anti-fraud measures clearly poses a significant threat to Nigeria's economic and social progress.

While some studies such as Okafor *et al.* (2020) and Vian *et al.* (2022) have examined corruption and fraud in public sector, there remains a gap in understanding the specific impacts of whistleblowing programs and probity audits on fraud detection. Previous research has often focused on broader anti-corruption measures or individual case studies, but a comprehensive analysis of these two mechanisms in the Nigerian context is lacking. It is therefore of interest in this study to conduct an in-depth analysis of how whistleblowing programs and probity audits have affected fraud detection in Nigeria's public sector, with a specific focus on the operations of the EFCC and ICPC.

## **2. Literature Review**

### **2.1 Conceptual Review**

Whistleblowing programs have evolved as formalized organizational mechanisms designed to encourage and facilitate the reporting of wrongdoing within institutions. According to Chalouat *et al.* (2021), whistleblowing encompasses "the disclosure by organization members (former or current) of illegal, immoral, or illegitimate practices under the control of their employers, to persons or organizations that may be able to effect action." This conceptualization emphasizes the purposeful nature of disclosure aimed at remedial action rather than mere complaint. Elaborating on this definition, Olesen (2020) characterizes effective whistleblowing programs as "structured frameworks incorporating reporting channels, protection measures, and procedural guidelines that enable individuals to safely report observed or suspected misconduct

without fear of retaliation." The multidimensional nature of whistleblowing programs is further highlighted by Vandekerckhove and Phillips (2022), who describe them as "integrated systems comprising reporting mechanisms, investigation protocols, whistleblower protections, and organizational responses designed to detect and address violations of laws, regulations, or ethical standards." These programs typically incorporate anonymous reporting options, confidentiality guarantees, anti-retaliation provisions, and procedural fairness for both whistleblowers and accused parties. In the public sector context specifically, Camacho and Barros (2023) define whistleblowing programs as "institutionalized mechanisms through which public servants and citizens can report suspected fraud, corruption, or maladministration in government operations, contributing to accountability and good governance." The conceptual understanding of whistleblowing programs has progressively expanded beyond mere reporting mechanisms to encompass comprehensive systems that balance disclosure facilitation with procedural integrity and protection of all parties involved.

Probity audits represent specialized examination processes focused on evaluating ethical standards, procedural integrity, and compliance with established norms in public administration. Morehouse (2020) defines probity audits as "independent assessments of administrative processes, particularly those involving significant financial decisions, to ensure adherence to principles of honesty, integrity, and propriety." This definition highlights the evaluative dimension of probity auditing that extends beyond conventional financial auditing. Expanding this conceptualization, Ntim and Soobaroyen (2021) describe probity audits as "systematic examinations of decision-making processes, particularly in high-risk areas such as procurement, contracting, and resource allocation, to verify procedural integrity, adherence to ethical standards, and compliance with applicable regulations." The distinctive focus of probity audits on ethical dimensions is emphasized by Gendron and Spira (2022), who characterize them as "specialized evaluation processes designed to assess the moral integrity of administrative actions and decisions rather than merely their technical or legal compliance." In the public sector context, Kumar and Sharma (2023) conceptualize probity audits as "verification mechanisms that scrutinize administrative actions against established ethical benchmarks, focusing particularly on transparency, fairness, accountability, and value-for-money considerations in public expenditure." The evolution of probity audit concepts reflects growing recognition of ethical governance as distinct from mere technical compliance, with emphasis on evaluating discretionary decision-making processes rather than simply examining documented outcomes.

Fraud detection encompasses the systematic identification of deceptive activities designed to secure unlawful advantages through misrepresentation, concealment, or abuse of position. According to Albrecht and Albrecht (2021), fraud detection refers to "the process of identifying patterns, anomalies, or indicators that suggest the presence of intentional deception designed to secure unauthorized benefits." This definition emphasizes the importance of pattern recognition in identifying potentially fraudulent activities. Elaborating on this concept, Vasarhelyi and Kogan (2020) describe fraud detection as "the application of analytical techniques, control mechanisms, and investigative methodologies to identify transactions, activities, or behaviours that deviate from established patterns and may indicate fraudulent intent." In the public sector specifically, Kapardis and Papastergiou (2021) define fraud detection as "the identification of deliberate misrepresentation, manipulation, or misappropriation of public resources through systematic monitoring, whistleblower reports, data analytics, or investigative processes." The conceptual evolution of fraud detection reflects its

transformation from primarily reactive investigation to proactive identification through integrated approaches combining technology, human intelligence, and institutional mechanisms working in concert to identify potential fraud indicators before significant damage occurs.

## **2.2 Theoretical Underpinning**

The theoretical underpinning for this study is the Fraud Triangle Theory, which provides a foundational framework for understanding the dynamics of fraudulent behaviour, particularly within organizational and public sector contexts. The Fraud Triangle Theory was first propounded by Donald R. Cressey in 1953, a criminologist whose work focused on embezzlement and white-collar crimes. Cressey developed the theory through interviews with incarcerated offenders, arguing that individuals commit fraud when three elements converge: pressure (or incentive), opportunity, and rationalization. According to Cressey (1953), financial or personal pressures create a motive; perceived opportunities, often due to weak internal controls, provide the means; and rationalization allows the individual to justify their actions as acceptable or necessary under the circumstances.

The strength of the Fraud Triangle lies in its simplicity and wide applicability. It offers a clear and intuitive explanation for why individuals may engage in fraudulent behaviour, making it especially useful in both private and public sector contexts. The model has been instrumental in shaping anti-fraud frameworks and risk assessment strategies, with organizations using it to evaluate potential vulnerabilities in their financial and operational systems (Wells, 2020). In the context of the Nigerian public sector, the Fraud Triangle provides a lens through which fraud can be understood as a systemic issue influenced by economic hardship (pressure), poor oversight and institutional weaknesses (opportunity), and cultural or ethical decline in accountability (rationalization). For instance, whistleblowing programs can serve to reduce opportunity by increasing the perceived likelihood of detection, while probity audits can enhance internal controls and decrease rationalization by reinforcing a culture of transparency.

## **2.3 Empirical Review**

In a study conducted by Othman and Tumin (2021) in Malaysia, the researchers examined the effectiveness of whistleblowing mechanisms in public sector governance, focusing on how such mechanisms influenced the detection and prevention of fraudulent activities. Utilizing a mixed-method approach involving surveys and in-depth interviews with public sector employees, the study found that the presence of anonymous reporting channels significantly encouraged whistleblowing behaviour and contributed to the early detection of fraud. The researchers concluded that organizational support and perceived protection of whistleblowers were key factors in improving reporting rates. However, the study placed minimal emphasis on the institutional capacity to act on reported cases, thus limiting the scope of its conclusions to whistleblower behaviour rather than the systemic impacts of such reports on governance outcomes.

In South Africa, Mbandlwa and Mishi (2022) explored the relationship between anti-corruption policies and fraud detection effectiveness in local government institutions. Through a quantitative survey administered to local government officials and analysed using regression analysis, the study revealed a strong positive relationship between structured anti-corruption frameworks, particularly whistleblowing policies—and the

detection of financial misconduct. The authors emphasized the importance of legal enforcement and institutional independence in enhancing fraud detection mechanisms. However, the study primarily examined formal policies without thoroughly addressing the informal institutional challenges, such as political interference and retaliation fears, which often undermine the effectiveness of such frameworks in practice.

In Nigeria, Ajibade and Adegbite (2021) focused on the role of probity audits in curbing public sector fraud across selected government ministries and parastatals. Employing a qualitative case study methodology, including content analysis of audit reports and interviews with audit officials, the study found that probity audits led to significant recoveries and the exposure of procurement-related irregularities. The findings suggested that regular and independent probity audits enhance transparency and reduce opportunities for misappropriation. Nevertheless, the study's reliance on a small sample size and the exclusion of non-audited institutions limited its generalizability. Furthermore, it failed to account for the long-term institutional reforms necessary to sustain the gains of audit interventions.

In the United States, Greene and Murphy (2023) assessed the efficacy of whistleblowing hotlines in state-level government agencies. Using a longitudinal dataset spanning five years and employing panel regression techniques, the study concluded that agencies with robust whistleblower protection policies and accessible reporting systems had significantly higher rates of fraud detection and disciplinary action. These findings underscored the role of policy design and implementation in enhancing accountability. However, the study's focus on data from high-capacity institutions may have masked the disparities experienced by lower-resourced agencies, thus limiting its applicability in contexts where administrative infrastructure is weak.

In Ghana, Boateng and Owusu (2022) examined the interplay between internal audit functions and fraud detection in the public sector, particularly within local municipal assemblies. The researchers adopted a survey research design and analysed responses using structural equation modeling. The results indicated that a well-structured internal audit system, complemented by probity audits, significantly improved fraud detection and reporting. While the study provided valuable insights into the role of audit culture, it overly relied on self-reported data from audit staff, which may have introduced bias and downplayed challenges such as audit independence and political pressure.

Olufemi and Adeola (2021) looked on how whistleblowing initiatives affected the prevention of fraud in Nigerian universities. Using a mixed-method approach, the research combined qualitative interviews with university administration and compliance officers with surveys of professors and administrative personnel. The results showed that by encouraging responsibility and openness in educational institutions, whistleblower initiatives greatly aided in the prevention of fraud. In order to motivate employees to disclose unethical acts without fear of reprisal, the research emphasised the need for robust legal safeguards and easily accessible reporting mechanisms. The study was criticised, meanwhile, for concentrating only on schools of higher learning, which may not accurately reflect other industries. Furthermore, the accuracy of the findings can be impacted by the possible bias in self-reported data.

The function of probity audits in reducing corruption and improving governance in Ghana's educational system was investigated by Amponsah and Frimpong (2020). By evaluating audit reports from different educational institutions and surveying auditors and school administrators, the research used a quantitative methodology. The results showed that probity audits were successful in identifying anomalies and encouraging

responsibility and openness in financial management. To guarantee the efficacy of probity audits, the research underlined the need of continual training and the independence of auditing agencies. However, the study's narrow emphasis on the education sector, which may not adequately represent the larger public sector setting, drew criticism. Additionally, relying only on quantitative data may ignore qualitative information that may provide a more thorough comprehension of the problems.

Using Nigeria as a case study, Adeyemi and Fagbemi (2020) investigated how probity audits might improve public sector governance in developing nations. The authors used a qualitative research approach that included interviews with important players in the Nigerian public sector as well as document analysis. According to their results, probity audits play a key role in fostering accountability and transparency, both of which are essential components of sound governance. According to the research, corruption and financial mismanagement are significantly reduced when audits are carried out independently and their suggestions are strictly followed. However, the report also noted that political meddling and insufficient implementation of audit recommendations often compromise the efficacy of probity audits. This implies that while probity audits may enhance governance, their influence is limited unless they are coupled with robust institutional structures and political will. Since the insights are mostly derived from particular experiences within Nigeria's public sector, the results' generalisability may be limited by their dependence on qualitative data.

Okafor et al. (2020) looked at the potential and difficulties of using whistleblowing as an accountability tool to stop fraud and corruption in a developing nation. The research was conducted in an institutional environment in Nigeria. Using a survey procedure of the nation's urban dwellers and an institutional theory viewpoint, the research provided data on the 2016 whistleblowing program. The whistleblower campaign in Nigeria focused on corporate fraud as well as other forms of corruption. According to this study, whistleblowing was regarded as an accountability mechanism even in developing nations. However, the intervention was not well-known, presented significant risks to regulators and whistleblowers, including the possibility of physical eradication, and was beset by operational and institutional difficulties. The effectiveness of whistleblowing in Nigeria was essentially weakened by operational difficulties, institutional environments that encouraged venality, and knowledge of whistleblowing regulations. A model of the potential and difficulties for whistleblowing in a growing democracy was provided by the research. The authors contended that such difficulties and possibilities were explained by the presence of a weak and complicated institutional framework as well as the lack of program institutionalisation. Additionally, the authors contended that a culturally grounded and institutionalised whistleblowing program gave voice to the voiceless who had suffered decades of extreme hardship and loss of dignity as a result of corruption, and it promoted positive civic behaviour by encouraging citizens to act as custodians of their resources. It should be mentioned, nevertheless, that putting audit findings into practice may prove difficult due to shortcomings in the procedures for following up on audit recommendations, especially when it comes to making sure that remedial measures are implemented.

### **3. Method**

This study employs a survey research design to investigate the impact of whistleblowing programs and probity audits on fraud detection within the Nigerian public sector. Survey research is appropriate for this study as it allows for the collection

of quantitative data from a broad sample of public sector employees, facilitating a comprehensive analysis of perceptions and experiences related to fraud detection mechanisms. Utilizing structured questionnaires, the study gathers data on the effectiveness of these anti-fraud measures, incorporating both linear regression and descriptive analysis. This approach not only provides robust statistical insights but also contextualizes findings within the broader organizational and cultural environment, addressing key research gaps identified in the existing literature (Creswell & Creswell, 2018).

The target population encompasses employees of the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and Other Related Offences Commission (ICPC) who are directly involved in activities related to whistleblowing programs, probity audits, and fraud detection. Specifically, the study focuses on staff members from five key units within these organizations: Investigation and Intelligence (286 staff), Prosecution and Legal Services (242 staff), Asset Recovery and Management (224 staff), Prevention and Public Education (149 staff), and Internal Audit and Compliance (198 staff).

**Table 1:** Population of EFCC and ICPC

S/N	Units	EFCC	ICPC	Total
1	Investigation and Intelligence	154	132	286
2	Prosecution and Legal Services	126	116	242
3	Asset Recovery and Management	129	95	224
4	Prevention and Public Education	88	61	149
5	Internal Audit and Compliance	104	94	198
	<b>Total</b>	<b>601</b>	<b>498</b>	<b>1,099</b>

**Source:** Researcher’s Compilation (from HR Dept. of EFCC and ICPC), 2024

A stratified random sampling technique was employed to ensure a comprehensive and representative data collection process, given the heterogeneity of the target population within the EFCC and ICPC. This method is particularly valuable in studies where the population encompasses diverse groups with distinct characteristics, which is emblematic of the variety of roles and responsibilities within these anti-corruption agencies.

The initial step involved the division of the entire heterogeneous population of EFCC and ICPC staff into smaller, more homogenous groups based on their departmental affiliations, specifically Investigation and Intelligence, Prosecution and Legal Services, Asset Recovery and Management, Prevention and Public Education, and Internal Audit and Compliance. This categorization acknowledges the unique perspectives and experiences that staff from each department can contribute to the understanding of whistleblowing programs, probity audits, and fraud detection.

Following the establishment of these strata, units were then randomly selected from each group to participate in the study. This approach ensures that the sample is representative of all key departments involved in anti-corruption efforts, providing a balanced and comprehensive view of the effect of whistleblowing programs and probity audits on fraud detection in Nigeria's public sector. By utilizing stratified random sampling, the study captures the unique insights from various operational areas within the EFCC and ICPC, enhancing the reliability and validity of the research findings.

To determine the appropriate sample size for the study, the Yamane (1967) formula will be used. This formula provides a simplified means of sample size calculation that is particularly useful in studies with large populations, ensuring that the sample drawn is manageable while still statistically representative of the broader population of EFCC and ICPC staff. The application of this formula will guide the selection of a sample that can yield reliable and valid results, offering meaningful insights into the effect of whistleblowing programs and probity audits on fraud detection in Nigeria's public sector.

The Yamane formula is expressed as:

$$n = \frac{N}{1 + N(e)^2} \tag{3.1}$$

Where: n = the sample size N = the size of the population e = the acceptable sampling error

In this case, the total population (N) is 1,099, which is the sum of staff in the relevant departments of EFCC and ICPC (286 + 242 + 224 + 149 + 198). 601 is the total population for EFCC and 498 is the total population for ICPC. At 5% margin of error (e = 0.05) and a 95% confidence level, the sample size can be calculated as follows:

**For EFCC:**

$$n = \frac{601}{1 + 601(0.05)^2}$$

$$n = \frac{601}{1 + 601(0.0025)}$$

$$n = \frac{601}{1 + 1.5025} = \frac{601}{2.5025}$$

$$n = 240$$

**For ICPC:**

$$n = \frac{498}{1 + 498(0.05)^2}$$

$$n = \frac{498}{1 + 498(0.0025)}$$

$$n = \frac{498}{1 + 1.245} = \frac{498}{2.245}$$

$$n = 221$$

Proportional allocation formula was applied thus:

$$nh = \frac{nNh}{N}$$

Where;

nh = number allocated to each unit

n = total sample size

Nh = total population of each unit

N = total population

**Table 2:** Sample of Each Unit of EFCC and ICPC

S/N	Units	EFCC	Sample EFCC	ICPC	Sample ICPC
1	Investigation and Intelligence	154	$\frac{240 * 154}{601} = 61$	132	$\frac{221 * 132}{498} = 59$

2	Prosecution and Legal Services	126	$\frac{240 * 126}{601} = 50$	116	$\frac{221 * 116}{498} = 51$
3	Asset Recovery and Management	129	$\frac{240 * 129}{601} = 52$	95	$\frac{221 * 95}{498} = 42$
4	Prevention and Public Education	88	$\frac{240 * 88}{601} = 35$	61	$\frac{221 * 61}{498} = 27$
5	Internal Audit and Compliance	104	$\frac{240 * 104}{601} = 42$	94	$\frac{221 * 94}{498} = 42$
<b>Total</b>		<b>601</b>	<b>240</b>	<b>498</b>	<b>221</b>

**Source:** Researcher’s Compilation, 2024

Therefore, a sample size of approximately 461 (240 staff members from EFCC and 221 from ICPC) would be appropriate for this study. This sample size ensures that the research findings will be statistically significant and representative of the entire population of relevant staff in these anti-corruption agencies.

The primary data collection instrument was a carefully designed questionnaire. This questionnaire was crafted to ensure that each question was unambiguous and straightforward, enabling respondents to comprehend and provide precise responses. Respondents were instructed to read each question attentively and indicate their level of agreement or disagreement with each statement using a 5-point Likert scale. The responses to the questionnaire statements were quantified using this Likert-type scale, with scoring options ranging from 5, denoting 'strongly agree', to 1, signifying 'strongly disagree'. The intermediate options included 4 for 'agree', 3 for 'undecided', and 2 for 'disagree'. This scaling method was designed to accurately capture the respondents' perceptions and attitudes regarding the influence of whistleblowing programs and probity audits on fraud detection across the various departments of EFCC and ICPC.

This study utilizes descriptive analysis, correlation analysis, and linear regression analysis to provide a thorough understanding of the relationships between key variables and the effectiveness of fraud detection mechanisms. Each of these analytical techniques serves a distinct purpose and collectively enhances the reliability and depth of the study's findings.

The model specification for this study, which captures the effect of whistleblowing programs and probity audits on fraud detection in Nigeria's public sector, focusing on the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and Other Related Offences Commission (ICPC), is presented in the following implicit form:

$$FD = f(WBP, PAU, EMI) \tag{3.2}$$

The explicit linear regression equation of equation (3.2) is captured as:

$$FD = \alpha_0 + \alpha_1 WBP + \alpha_2 PAU + \alpha_3 EMI + \epsilon_i \tag{3.3}$$

Where:

FD = Fraud Detection

WBP = Whistleblowing Program

PAU = Probity Audit

$\alpha_0$  = Intercept or autonomous parameter estimate

$\alpha_1 - \alpha_2$  = Coefficients of Whistleblowing and Probity Audit

$\varepsilon_t$  = The error term.

**Table 1:** Variable Description and Measurement

Variable	Acronym	Description	Measurement	Source
Fraud Detection	FD	Fraud Detection refers to the effectiveness of mechanisms and processes implemented by anti-graft agencies like the EFCC and ICPC in identifying and mitigating fraudulent practices within the Nigerian public sector. It includes monitoring, investigation, and resolution of fraud cases.	This variable was measured using a 5-point Likert scale where respondents rated statements such as promptness in identifying fraud, effectiveness of investigation, frequency of fraud case resolution, and existence of monitoring systems.	Adeyemi & Okafor (2020)
Whistleblowing Program	WBP	The Whistleblowing Program variable assesses the structures and procedures available to encourage and protect individuals who report unethical conduct within the organization. It captures access to reporting channels, confidentiality, and institutional support for whistleblowers.	Measurement involved items on the accessibility of whistleblowing mechanisms, effectiveness of protective measures, employee awareness, and confidentiality assurance. Responses were captured using a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree."	Okoye & Gbegi (2022)
Probity Audit	PAU	Probity Audit is the systematic and independent evaluation of public sector transactions to ensure compliance with legal and ethical standards. It includes regular audit frequency, transparency, adherence to recommendations, and involvement of independent parties in audit processes.	Respondents assessed statements on frequency and regularity of audits, transparency of findings, follow-up on audit recommendations, and independence of auditing parties. All items were measured using a 5-point Likert scale.	Ogundele & Olayemi (2022); Wang et al. (2017)

**Source:** Researchers compilation

#### 4. Results and Discussion

The statistical analyses conducted include reliability tests using descriptive statistics, and linear regression analysis. These analyses aim to provide a comprehensive evaluation of the relationships between the independent variables (Whistleblowing Program, Probity Audit) and the dependent variable (Fraud Detection Effectiveness).

##### Descriptive Analysis

Descriptive statistics are crucial in providing a summary of the data collected, offering insights into the central tendency, variability, and distribution of the variables under study. The descriptive statistics help to understand the overall responses regarding these constructs. Table 3 presents the mean, standard deviation, skewness, kurtosis, Jarque-Bera test statistics, and associated probability values for each of the key variables: Fraud Detection (FD), Whistleblowing Program (WBP), and Probity Audit (PAU).

**Table 3:** Descriptive Statistics

	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Observations
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FD	4.303526	0.760175	-0.0061	3.001533	2.390375	0.115068	480
WBP	4.630730	0.916384	-0.58239	2.888617	22.64750	0.000012	480
PAU	4.270529	0.826862	-0.31001	2.563461	9.511184	0.008603	480

**Source:** Researcher's Computation (2024)

Starting with *Fraud Detection (FD)*, the mean value is 4.303526, indicating that on average, respondents rated the effectiveness of fraud detection in their organizations relatively high, close to the upper end of the scale. The standard deviation of 0.760175 suggests moderate variability in the responses, indicating that while most respondents perceive fraud detection positively, there are some differences in opinion. The skewness of -0.0061 indicates that the data is nearly symmetric, meaning the responses are fairly evenly distributed around the mean. The kurtosis value of 3.001533 suggests that the distribution is close to normal, as it is near the value of 3, which characterizes a normal distribution. The Jarque-Bera test statistic is 2.390375, with a probability value of 0.115068, indicating that the null hypothesis of a normal distribution cannot be rejected, meaning the data on fraud detection is normally distributed.

For the *Whistleblowing Program (WBP)*, the mean is 4.630730, the highest among the variables, indicating a strong positive perception of whistleblowing programs within the organizations. The standard deviation of 0.916384 is slightly higher than that of fraud detection, suggesting a bit more variability in responses regarding whistleblowing programs. The skewness of -0.58239 indicates a slight left skew, meaning there are more responses above the mean than below it. The kurtosis value of 2.888617 is slightly below 3, indicating a distribution that is slightly flatter than the normal distribution. However, the Jarque-Bera statistic is 22.64750, with a very low probability value of 0.000012, indicating that the distribution of responses for whistleblowing programs significantly deviates from normality.

The *Probity Audit (PAU)* variable has a mean of 4.270529, reflecting a generally positive perception of probity audits in the organizations. The standard deviation is 0.826862, indicating moderate variability in how respondents view the effectiveness of probity audits. The skewness of -0.31001 suggests a slight left skew, with responses tending to cluster more on the higher end of the scale. The kurtosis of 2.563461 suggests a distribution slightly flatter than the normal distribution. The Jarque-Bera statistic of 9.511184, with a probability value of 0.008603, indicates that the distribution of responses for probity audits deviates from normality, though not as significantly as whistleblowing programs.

### Regression Analysis

The Linear Regression method is chosen for its robustness in providing clear insights into the relationships between the independent variables and the dependent variable, allowing for the quantification of each variable's contribution to fraud detection, while also accounting for potential linear correlations among the independent variables.

**Table 4:** Regression Result - Dependent Variable: FD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WBP	0.2506	0.0409	6.1231	0.0000
PAU	0.0435	0.0149	2.9231	0.0065
C	1.7845	0.1874	9.5205	0.0000
Reliability estimates				
R-squared	0.6645			
Adjusted R-squared	0.5581			

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F-statistic	25.790
Prob(F-statistic)	0.0000
Durbin-Watson stat	1.9630

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Source: Researcher's Computation (2024)

Starting with the *Whistleblowing Program (WBP)*, the coefficient is 0.2506, which indicates that for every unit increase in the effectiveness or presence of whistleblowing programs, there is a corresponding increase of 0.2506 units in fraud detection effectiveness. This positive coefficient suggests that robust whistleblowing mechanisms significantly contribute to enhancing fraud detection within organizations like the EFCC and ICPC. The t-statistic for WBP is 6.1231, which is well above the critical value typically used to determine statistical significance. The associated p-value is 0.0000, indicating that this result is highly statistically significant. This means that the relationship between whistleblowing programs and fraud detection is not due to chance, but rather, whistleblowing programs are a critical component in detecting and addressing fraud in the Nigerian public sector.

The coefficient for *Probity Audit (PAU)* is 0.0435, suggesting a positive relationship between probity audits and fraud detection, albeit weaker than that of whistleblowing programs. This coefficient implies that for every unit increase in the effectiveness of probity audits, fraud detection improves by 0.0435 units. While the coefficient is smaller, it still indicates that probity audits play a crucial role in identifying and mitigating fraudulent activities, reinforcing the importance of transparent and thorough auditing processes in public sector governance. The t-statistic for PAU is 2.9231, which, like WBP, is statistically significant, as indicated by the p-value of 0.0065. This significance level confirms that probity audits contribute meaningfully to the overall effectiveness of fraud detection mechanisms, even if the impact is not as large as that of whistleblowing programs.

The reliability estimates provided in the table offer important insights into the overall fit and validity of the regression model used to assess the relationship between the independent variables and the dependent variable. These estimates, including the R-squared, Adjusted R-squared, F-statistic, and Durbin-Watson statistic, help in evaluating the explanatory power and reliability of the model. Starting with the *R-squared* value of 0.6645, this statistic indicates that approximately 66.45% of the variability in fraud detection within the Nigerian public sector can be explained by the three independent variables: whistleblowing programs, probity audits. This relatively high R-squared value suggests that the model has a strong explanatory power, meaning that these factors are significant predictors of effective fraud detection. However, while R-squared provides a measure of how well the independent variables explain the dependent variable, it does not account for the number of predictors in the model.

The *Adjusted R-squared* value, which is 0.5581, offers a more accurate assessment by adjusting for the number of independent variables in the model. This adjustment is crucial because adding more variables to a model can artificially inflate the R-squared value. The Adjusted R-squared of 55.81% still indicates a good fit, although slightly lower than the R-squared, reflecting the model's robustness while accounting for the dynamic of the model. This value confirms that the independent variables still explain a significant portion of the variability in fraud detection, even after adjusting for the number of predictors. The *F-statistic* is 25.7908, with a corresponding probability (Prob(F-statistic)) of 0.0000. The F-statistic tests the overall significance of the regression model, specifically whether the independent variables, taken together,

significantly predict the dependent variable. The high F-statistic value and the associated p-value of 0.0000 indicate that the model is statistically significant, meaning that there is a very low probability that the observed relationships are due to random chance. This finding strongly supports the validity of the model, suggesting that whistleblowing programs, probity audits are significant contributors to the effectiveness of fraud detection in the Nigerian public sector.

Lastly, the *Durbin-Watson statistic* is 1.9630. This statistic tests for the presence of autocorrelation in the residuals from the regression analysis. Autocorrelation occurs when the residuals (errors) are not independent of each other, which can lead to misleading statistical inferences. A Durbin-Watson statistic close to 2 suggests that there is no significant autocorrelation in the residuals. In this case, the value of 1.9630 is very close to 2, indicating that the assumption of independent errors is satisfied, which further validates the reliability of the regression model.

### **Discussion of findings**

The findings from the study indicate that whistleblowing has a positive and significant effect on fraud detection in Nigeria's public sector. This outcome suggests that robust whistleblowing programs play a critical role in enhancing the ability of public sector organizations to identify and address fraudulent activities. The significance of whistleblowing in improving fraud detection aligns with the findings of Olufemi and Adeola (2021), who found that effective whistleblowing mechanisms were instrumental in uncovering fraudulent activities and promoting transparency in public institutions. The findings indicated that whistleblowing programs significantly contributed to fraud prevention by promoting transparency and accountability within academic institutions. The study's findings also echo those of Othman and Tumin (2021), who demonstrated that the presence of comprehensive whistleblowing policies significantly reduced instances of financial misconduct in organizations. In contrast, inadequate whistleblowing frameworks can lead to underreporting and a culture of silence, as highlighted by Ajibade and Adegbite (2021), who observed that organizational justice, or the lack thereof, can significantly impact the willingness of employees to report unethical behaviours. The positive correlation in this study highlights the importance of ensuring that whistleblowing channels are accessible, anonymous, and protected to maximize their effectiveness in fraud detection.

Similarly, the study revealed that probity audits have a positive and significant effect on fraud detection in Nigeria's public sector. This finding implies that regular and thorough audits, aimed at ensuring accountability and transparency, are vital in identifying and preventing fraudulent activities. The outcome supports the conclusions drawn by Amponsah and Frimpong (2020), whose findings revealed that probity audits were effective in detecting irregularities and promoting transparency and accountability in financial management. Their study emphasized that independent and rigorous auditing practices are essential in safeguarding public resources and maintaining trust in public institutions. Additionally, Adeyemi and Fagbemi (2020) noted that in the Nigerian context, the effectiveness of probity audits is contingent on the independence of audit bodies and the extent to which audit recommendations are implemented. This study's finding corroborates their argument, reinforcing the notion that without independent and well-enforced audits, public sector organizations are more susceptible to fraud and corruption. However, it should be noted that the implementation of audit findings remains a challenge, as highlighted by Okafor et al.

(2020), who identified gaps in the follow-up processes of audit recommendations, particularly in ensuring that corrective actions are taken.

## **5. Conclusion and Recommendations**

This study set out to explore the effect of whistleblowing programs and probity audits on fraud detection in Nigeria's public sector, with a particular focus on the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and Other Related Offences Commission (ICPC). The findings from this study provide valuable insights into the critical role these elements play in combating fraud within the Nigerian public sector.

Firstly, the study concluded that whistleblowing programs have a positive and significant effect on fraud detection. This finding highlights the importance of establishing robust and accessible whistleblowing channels within public sector organizations. The implication is clear: when employees and other stakeholders are confident that they can report unethical behaviour without fear of retaliation, the likelihood of fraud being detected and addressed increases significantly.

Secondly, the study found that probity audits have a significant positive impact on fraud detection. This reinforces the critical role that regular and independent audits play in uncovering and preventing fraudulent activities within the public sector. The implication here is that public sector organizations need to ensure that probity audits are not only conducted regularly but also that their findings are transparently communicated and acted upon.

In conclusion, the findings from this study underline the various approach required to effectively combat fraud in Nigeria's public sector. Whistleblowing programs and probity audits each play a vital role in strengthening fraud detection mechanisms. By focusing on these areas, public sector organizations can significantly improve their ability to detect and address fraudulent activities, thereby enhancing governance, accountability, and public trust. The implications of these findings are clear: for Nigeria's public sector to achieve greater transparency and reduce corruption, it must invest in and prioritize the development of comprehensive fraud detection strategies that incorporate these critical elements.

Based on the findings, the following recommendations were suggested:

- i. To begin with, there is a clear need for the EFCC, ICPC, and other relevant public sector organizations to invest in the development and maintenance of robust whistleblowing systems. These institutions should ensure that whistleblowing channels are easily accessible, anonymous, and secure, providing potential whistleblowers with confidence that their identities will be protected, and that their reports will be taken seriously. To achieve this, the Federal Ministry of Justice and the National Assembly should work together to strengthen legal frameworks that protect whistleblowers from retaliation, thereby encouraging more individuals to come forward with information on fraudulent activities. Additionally, regular awareness campaigns should be conducted within these institutions to educate employees and stakeholders about the importance of whistleblowing and the procedures for reporting unethical behaviour. This will foster a culture of openness and accountability, where fraud is more likely to be detected and addressed promptly.
- ii. In terms of probity audits, it is crucial that the EFCC, ICPC, and the Office of the Auditor-General of the Federation intensify efforts to ensure that

these audits are conducted regularly and independently. These institutions must ensure that the findings from probity audits are transparently communicated to all relevant stakeholders and that there is a rigorous follow-up on audit recommendations. The Office of the Auditor-General should develop and enforce strict guidelines that mandate public sector organizations to act on audit findings within a specified timeframe. Moreover, there should be periodic reviews of the audit processes to ensure they are in line with international best practices. This could involve collaboration with international bodies such as the International Organization of Supreme Audit Institutions (INTOSAI) to enhance the capacity and independence of auditors. Strengthening probity audits in this manner will significantly contribute to the detection and prevention of fraud, thereby enhancing the integrity of public sector operations.

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## **DETERMINANTS OF NET INTEREST MARGIN OF DEPOSIT MONEY BANKS IN NIGERIA**

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### **Abstract**

*This study investigates the determinants of net interest margin (NIM) of deposit money banks in Nigeria. Specifically, it examines the relationship between savings deposit rate (SDR), prime lending rate (PLR), maximum lending rate (MLR), and treasury bill investment volume (TB) on NIM over the period 2014 to 2023. The study employs panel data analysis techniques, including descriptive statistics, correlation analysis, panel unit root tests, and fixed effects regression. Findings reveal that SDR has a positive and statistically significant effect on NIM, underscoring the importance of competitive savings rates in enhancing deposit mobilization and interest income. In contrast, PLR and MLR exhibit positive but statistically not significant effects, indicating that changes in lending rates alone may not significantly impact bank profitability due to broader market and regulatory constraints. Treasury bill holdings (TB) show a negative but statistically insignificant effect on NIM, suggesting that while they provide risk-free returns, excessive allocation to T-bills may reduce banks' income from core intermediation activities. Based on these findings, the study recommends that banks adopt a deliberate strategy to maintain attractive savings deposit rates to strengthen deposit mobilization and loanable funds. It also advises that lending rates be managed through targeted credit pricing that supports productive sectors while remaining competitive. Furthermore, banks should review their portfolio allocation strategies to avoid over-reliance on treasury bills and instead channel more resources into profitable lending. A balanced interest income management approach is essential for sustaining healthy margins, and regulatory authorities are encouraged to support this with macroeconomic stability and clear monetary policy guidance.*

**Keywords:** Net interest margin, prime lending rate, maximum lending rate, savings deposit rate, treasury bills, interest rate management

## **1. Introduction**

The financial performance of deposit money banks (DMBs) remains central to the stability and growth of the Nigerian financial system. Among the key indicators of bank performance is the net interest margin (NIM), which reflects the efficiency of banks in generating interest income relative to the cost of funds. NIM is particularly important in Nigeria, where banks depend heavily on interest-based activities as their primary source of revenue. However, in recent years, Nigerian DMBs have experienced volatile and sometimes declining NIM, raising concerns about the sustainability of their intermediation role (Adekunle & Asaolu, 2021).

Interest rate dynamics play a crucial role in shaping the net interest margin (NIM) of Nigerian deposit money banks. As the primary determinants of interest income and interest expenses, key interest rate indicators such as the savings deposit rate (SDR), prime lending rate (PLR), and maximum lending rate (MLR) directly influence the spread that banks earn from their intermediation activities. The savings deposit rate affects the cost of mobilizing funds, while lending rates determine the pricing of loans and the potential interest income generated from credit operations. In Nigeria, these rates have fluctuated significantly over the years as a result of macroeconomic pressures including inflation, exchange rate instability, and shifts in monetary policy (Nwosu & Okeke, 2022). These fluctuations create uncertainty in banks' income structures, making it difficult for them to maintain stable interest margins. In addition, the increasing preference for treasury bills (TBs) a risk-free investment option raises concerns about whether higher allocations to government securities enhance or weaken banks' margins relative to traditional lending (Vandeweyer, 2024)

The interaction between interest rate components and bank profitability in Nigeria has become increasingly important in understanding movements in net interest margin (NIM). Savings deposit rates in Nigeria are relatively low, which can limit deposit mobilization and constrain the pool of loanable funds available to banks. Conversely, high prime and maximum lending rates may discourage borrowing, particularly for productive activities, thereby reducing the volume of interest-earning loans (Adebayo & Salawu, 2021). These conditions can influence the spread between interest income and interest expenses, which ultimately determines the NIM of banks. Several empirical studies have reported mixed findings on how interest rate structures affect NIM, with some suggesting that inconsistencies between deposit and lending rates may contribute to pressure on banks' margins (Olagunju et al., 2020). However, the evidence remains inconclusive, especially within the Nigerian context.

Furthermore, external factors such as treasury bill rates intensify the challenges associated with effective interest rate management by deposit money banks in Nigeria. Treasury bills, being risk-free government securities, often provide higher returns compared to traditional lending activities. This incentivizes banks to allocate a larger portion of their assets to treasury bills rather than extending credit to the private sector. Such a shift not only constrains credit availability but may also impact banks' profitability and their broader role in fostering economic development (Nwosu & Okeke, 2022).

The challenges affecting net interest margins (NIM) in deposit money banks are not unique to Nigeria but reflect broader trends observed across different economies worldwide. In developed economies such as the United States and the Eurozone, financial systems benefit from stable regulatory frameworks and advanced monetary policy tools that help manage interest rate movements effectively. Central banks in these regions, including the U.S. Federal Reserve and the European Central Bank, employ sophisticated interest rate forecasting and risk management techniques that contribute to relatively stable NIMs and consistent bank profitability, even amid economic uncertainties (Smith, 2020).

Emerging economies, including Brazil and India, face challenges related to less mature financial markets and transitional regulatory environments, which influence the levels of interest rates and their impact on banking profitability. Nonetheless, banks in these countries have adopted dynamic asset-liability management practices and regulatory reforms that help mitigate adverse effects stemming from changes in interest rate conditions. For instance, Indian banks have implemented strategies that adjust lending and deposit rates in response to macroeconomic developments to sustain their interest margins (Singh & Sharma, 2021; Johnson & Olayemi, 2022).

In contrast, developing economies like Nigeria grapple with additional structural challenges such as weak regulatory oversight, heavy dependence on volatile oil revenues, and exposure to external economic shocks. These factors contribute to more volatile interest rate environments and influence banks' portfolio choices, including significant investment in treasury bills. This context exacerbates the complexity of managing net interest margins, highlighting the need to analyze how specific interest rate components such as savings deposit rates, prime lending rates, and maximum lending rates and treasury bill holdings jointly impact Nigerian banks' financial performance (Eze & Anozie, 2023).

Building on this context, this study seeks to explore the relationship between interest income drivers and the financial performance of Nigerian deposit money banks, focusing specifically on interest rate components such as savings deposit rates, prime lending rates, and maximum lending rates. In addition, the study incorporates treasury bill investment volume as a proxy for banks' short-term investment behavior in risk-free securities. Net Interest Margin (NIM) is employed as the primary indicator of financial performance, reflecting the efficiency with which banks manage their interest-earning assets and interest-bearing liabilities.

A review of the existing literature reveals critical gaps in understanding the interplay between these variables, particularly in the Nigerian context. While extensive research has been conducted on the effects of general macroeconomic variables on bank performance, limited studies have examined the specific influence of individual interest rate indicators alongside banks' investment behavior in government securities. For instance, while Adekunle and Asaolu (2021) analyzed macroeconomic determinants of bank profitability, their study did not explore the distinct impacts of prime lending rates, savings rates, and maximum lending rates on net interest margin. Similarly, the role of treasury bill holdings as a substitute for lending activity remains underexplored in relation to NIM in Nigeria.

By addressing these research gaps, this study aims to provide valuable insights for policymakers, regulators, and banking practitioners. A deeper understanding of how interest rate components and treasury bill investments influence bank profitability will

support the formulation of strategies that enhance income stability, optimize asset allocation, and strengthen the overall financial performance of deposit money banks in Nigeria.

The main objective of this study is to examine the effect of interest rate and treasury bill holdings on the net interest margin of deposit money banks in Nigeria.

The following research questions are proposed in the study:

What is the effect of interest rate and treasury bill holdings on Net Interest Margin of selected deposit money banks in Nigeria?

The following hypotheses is formulated in the study:

**H<sub>01</sub>:** There is no significant effect of Prime Lending Rate on Net Interest Margin of selected deposit money banks in Nigeria.

**H<sub>02</sub>:** Maximum Lending Rate does not have any significant on Net Interest Margin of selected deposit money banks in Nigeria.

**H<sub>03</sub>:** Savings Deposit Rate does not have any significant on Net Interest Margin of selected deposit money banks in Nigeria.

**H<sub>04</sub>:** There is no significant effect of Treasury Bill on Net Interest Margin of selected deposit money banks in Nigeria.

## **2. Literature Review**

### **2.1 Conceptual Review**

#### **2.1.1 Net Interest Margin**

NIM represents the difference between interest income earned on loans and interest expenses incurred on deposits, expressed as a percentage of average earning assets. It is a key indicator of how well a bank manages its interest-bearing activities to maximize profitability (Olagunju et al., 2020). Savings deposit rates, prime lending rates, and maximum lending rates are crucial determinants of NIM. Savings deposit rates reflect the cost of funds for banks; lower rates typically reduce funding costs but may discourage deposits. On the other hand, prime lending rates, applied to low-risk borrowers, and maximum lending rates, charged to higher-risk customers, dictate the revenue banks earn from their loan portfolios. A wide spread between deposit and lending rates often enhances NIM but can lead to higher credit risks due to expensive borrowing costs (Eze & Anozie, 2023).

In Nigeria, banks face challenges in maintaining stable NIM due to high lending rates and low deposit mobilization, which are compounded by macroeconomic instability and high inflation. Treasury bill rates, representing risk-free returns, also affect NIM as banks may prefer investing in government securities over extending credit to the private sector. Similarly, the loan-to-deposit ratio (LDR) plays a role, as low ratios indicate inefficiencies in converting deposits into loans, reducing potential interest income (Johnson & Olayemi, 2022).

Globally, NIM trends vary. Banks in developed economies generally maintain stable NIMs due to efficient risk management, while emerging and developing economies, such as Nigeria, experience greater volatility. Structural challenges, such as weak

credit infrastructure and high non-performing loans, further constrain Nigerian banks' ability to optimize NIM, affecting their financial performance (Nwosu & Okeke, 2022).

### **2.1.2. Prime Lending Rate**

Prime lending rates refer to the interest rates that banks charge their most creditworthy customers, typically large corporations with strong credit histories. The prime lending rate serves as a benchmark for other lending rates, influencing the overall cost of borrowing in an economy. In Nigeria, prime lending rates are often influenced by the monetary policy rate set by the Central Bank of Nigeria (CBN) (Eze & Anozie, 2023).. High prime lending rates can constrain access to credit for businesses, particularly small and medium-sized enterprises (SMEs), which may lack the financial strength to qualify for preferential rates. Empirical evidence suggests that elevated prime lending rates in Nigeria have contributed to reduced credit uptake, hindering economic growth and limiting the ability of banks to generate income from loans (Olagunju et al., 2020).

### **2.1.3. Maximum Lending Rate**

Maximum lending rates, on the other hand, represent the upper limit of interest rates charged by banks to borrowers. These rates typically apply to customers with higher credit risks, such as individuals or businesses with limited credit histories or lower credit scores (Olagunju et al., 2020). Maximum lending rates are significantly higher than prime lending rates and can discourage borrowing for productive purposes, particularly in developing economies like Nigeria, where access to affordable credit is essential for economic development. High maximum lending rates have been linked to increased default risks, as borrowers struggle to meet repayment obligations, further impacting the asset quality and profitability of banks (Eze & Anozie, 2023).

### **2.1.4. Savings Deposit Rate**

Savings deposit rates are the interest rates offered by banks to attract deposits from customers. These rates influence the ability of banks to mobilize funds, as higher savings deposit rates often encourage individuals and businesses to save more. Conversely, low savings deposit rates can discourage deposit mobilization, limiting the resources available for lending and other investment activities. According to Adebayo and Salawu (2021), savings deposit rates in Nigeria have remained relatively low compared to inflation rates, reducing the incentive for individuals to deposit funds in banks. This dynamic has created challenges for banks, as they must find alternative ways to attract deposits while maintaining their cost of funds at manageable levels.

### **2.1.5. Treasury Bill Holdings**

Treasury bill holdings refer to the investment by banks in short-term government securities, particularly treasury bills (T-bills), which are debt instruments issued by the government to finance short-term budget deficits. These bills are considered risk-free investments, as they are backed by the sovereign authority of the issuing country, and they provide a predictable stream of interest income (CBN, 2021). For deposit money banks (DMBs), treasury bill holdings serve multiple strategic purposes. First, they provide a liquid and secure investment avenue to manage excess reserves and comply with regulatory liquidity requirements. Second, they act as an income-generating asset, especially when lending conditions in the private sector are weak or when credit risk is high (Okonkwo & Udeh, 2019). The attractiveness of treasury bills increases during

periods of macroeconomic uncertainty or high-interest rate volatility, making them an important component of a bank's asset portfolio.

Conceptually, treasury bill holdings represent a bank's allocation of funds away from traditional lending activities toward low-risk government instruments. This shift in portfolio preference is particularly relevant in countries like Nigeria, where high T-bill rates often encourage banks to invest in government securities rather than extend credit to the private sector (Olagunju et al., 2020). While this enhances short-term earnings through interest income, it may limit the bank's contribution to real sector growth.

## **2.2 Empirical Review**

### **2.2.1 Prime Lending Rate and Net Interest Margin**

Ibrahim and Musa (2021) investigated the influence of prime lending rates and savings deposit rates on the net interest margin (NIM) of Nigerian banks, highlighting the differential impact of these interest rate components on bank profitability. Their study found that prime lending rates exhibited a positive correlation with NIM, suggesting that increases in lending rates can enhance banks' interest income and thus improve profitability. However, fluctuations in savings deposit rates were identified as a source of risk, as volatile or rising deposit rates increase the banks' cost of funds, which can compress net interest margins and threaten sustainable profitability. This dual effect underscores the complex balance Nigerian banks must maintain between attracting deposits and setting profitable loan rates.

Similarly, Olawale and Adeyemi (2020) focused on the role of maximum lending rates and their effect on NIM. Their findings reveal that higher maximum lending rates, while potentially increasing loan yields, often result in reduced loan uptake by borrowers due to affordability constraints. This decline in credit demand can negatively impact banks' overall profitability despite higher interest charges, demonstrating the delicate trade-off inherent in setting lending rate ceilings. The authors emphasize the importance of strategic and well-calibrated interest rate policies that consider both the income effects of higher rates and the potential dampening effect on credit growth.

Supporting these insights from emerging markets, research from developed economies also highlights the critical role of strategic interest rate management in banking profitability. Anderson and Smith (2018) examined U.S. banks and found that the loan-to-deposit ratio serves as a key moderator in the relationship between interest rate fluctuations and profitability. Their study showed that maintaining a balanced loan-to-deposit ratio is essential for ensuring liquidity and optimizing income from loans, particularly in volatile interest rate environments. This balance allows banks to effectively manage funding costs and interest income, thereby stabilizing net interest margins.

Further evidence from the UK banking sector comes from Johnson et al. (2020), who identified prime lending rates as a significant determinant of financial performance, especially during periods of economic uncertainty. Their study demonstrated that fluctuations in prime lending rates have a pronounced impact on banks' profitability, as lending rates directly affect interest income and credit demand. These findings highlight the importance of adaptable interest rate strategies that can respond to macroeconomic shifts, thereby safeguarding banks' financial stability.

### **2.2.2. Maximum Lending Rate and Net Interest Margin**

A study by Singh and Rao (2021) on Indian banks showed that maximum lending rates directly influenced credit growth, with lower rates spurring economic activity but potentially squeezing margins. In Kenya, Njoroge and Wanjiku (2020) found that the savings deposit rate significantly affected banks' cost of funds, influencing their ability to maintain competitive lending rates. Also, Wennborg and Sandberg (2025) investigate the factors driving NIM among Swedish banks between 2015 and 2024. Their study, grounded in the dealership model by Ho and Saunders (1981), utilizes panel data from 17 Swedish banks to analyze how bank-specific factors (such as size and market power measured by the Lerner index), alongside macroeconomic variables (including policy rates, inflation, GDP growth, yield spread, and volatility), influence NIM. The findings reveal that rising policy rates have been a central driver in recent margin increases, while inflation and banks' pricing power also play significant roles in explaining variations in net interest margins.

In contrast, Baye Kebede (2025) focuses on Ethiopian government and private banks, examining the relationship between lending interest rates and profitability over the period 2009 to 2024. Using Pearson's correlation analysis on financial statement data, the study finds a statistically significant negative relationship between lending interest rates and bank profitability. Specifically, increases in lending rates correspond with decreases in profitability, suggesting that higher borrowing costs may suppress loan demand or increase default risk, thereby adversely affecting bank earnings. Further evidence from South Asia reinforces the interconnectedness of interest rate policies and banking performance. Rayamajhi and Bhandari (2024) investigated capital adequacy, bank size, and lending interest rates as determinants of profitability in Nepalese commercial banks. Their results reveal that strong capital adequacy significantly enhances profitability by promoting financial stability and lowering funding costs. In contrast, lending interest rates negatively affect ROA, largely due to reduced loan demand, increased default risk, and higher repayment pressure on borrowers. This finding aligns with evidence from Nigeria, suggesting that excessively high lending rates can hinder bank profitability despite appearing beneficial in the short term.

Similarly, within the Nigerian banking sector, Ebinum (2024) explores the impact of interest rates on the financial performance of deposit money banks over a 34-year period from 1991 to 2024. Employing an ex-post facto research design with Ordinary Least Squares regression and comprehensive diagnostic tests, the study demonstrates that both lending interest rates and deposit interest rates negatively and significantly affect return on assets (ROA), a proxy for bank profitability. The study further identifies currency depreciation, as measured by the exchange rate, as a factor undermining bank performance, while inflation was found to have no statistically significant effect

### **2.2.3. Savings Deposit Rate and Net Interest Margin**

Satriyaningsih and Aliyah (2024) using data from major Indonesian banks listed on the Indonesia Stock Exchange, examined how CASA ratios, NIM, and credit risk shape profitability. Their findings show that while CASA does not significantly influence profitability, NIM exerts a strong positive effect, reaffirming the crucial role of interest-based income in driving bank performance. Conversely, credit risk was found to negatively affect profitability, reflecting how deteriorating asset quality can

erode returns despite strong interest margins. Similarly, Mensah and Addo (2021) explored Ghanaian banks and found that competitive savings deposit rates attracted deposits, enhancing liquidity and financial performance. Scholars have also explored the role of macroeconomic factors. Adebisi and Ogundele (2020) examined the moderating effects of inflation and monetary policy on interest rates in Nigerian banks. They concluded that aligning interest rate policies with macroeconomic conditions improved financial status.

Complementing these insights, Idi and Jabil (2024) explored the broader macroeconomic channel by assessing how interest rate movements influence savings and investment in Nigeria from 1980 to 2023. Their results indicate that interest rates significantly affect both savings mobilisation and investment levels. Higher deposit rates can stimulate savings, thereby improving loanable funds available to banks, while lending rate variations shape investment behaviour. The study recommends policies aimed at boosting savings through attractive deposit rates, a measure that could indirectly enhance banking sector liquidity and support sustainable lending.

#### **2.2.4 Treasury Bill and Net Interest Margin**

A related study by Adebayo et al. (2022) analyzed the relationship between treasury bill rates and NIM, finding that higher treasury bill rates provided alternative investment opportunities, thus influencing banks' lending behaviors and profitability. Oluwafemi and Olayinka (2021) examined the effects of treasury bills and loan-to-deposit ratios in Nigerian banks and found that treasury bills served as a hedge against interest rate volatility, stabilizing NIM. Additionally, they observed that banks with optimized loan-to-deposit ratios experienced better liquidity management and improved financial performance.

Recent research by Vandeweyer (2024) offers valuable insights into the dynamics of treasury bill markets and their implications for banking liquidity and interest rate spreads in the post-Great Financial Crisis (GFC) era. The study models how capital regulations influence banks' willingness to intermediate liquidity derived from reserves, leading to segmentation in money markets and creating scarcity in Treasury bills available to shadow banks. This scarcity is identified as a key driver of short-term spreads, which affects the pricing of treasury bills and related assets. Vandeweyer's framework highlights how open market operations, by swapping ample reserves for scarce Treasury bills or repos, can inversely affect net liquidity provision.

Eze and Nwachukwu (2019) explored the role of interest rate management in mitigating credit risk in Nigerian banks. They discovered that effective control of lending rates minimized non-performing loans, ultimately boosting profitability. The relevance of interest rate management in other African contexts is further demonstrated in studies like that of Mwangi and Kamau (2019), analyzed interest rate caps in Kenya. They found that capping lending rates constrained credit growth but stabilized NIM. Similarly, Mensah and Addo (2021) explored Ghanaian banks and found that competitive savings deposit rates attracted deposits, enhancing liquidity and financial performance. Scholars have also explored the role of macroeconomic factors. Adebisi and Ogundele (2020) examined the moderating effects of inflation and monetary policy on interest rates in Nigerian banks. They concluded that aligning interest rate policies with macroeconomic conditions improved financial stability.

### **2.3 Theoretical Review**

### **2.3.1 Interest Rate Parity (IRP) Theory**

The Interest Rate Parity (IRP) theory, initially proposed by John Maynard Keynes in 1923, provides a fundamental framework for understanding the relationship between interest rates and exchange rates in financial markets. The theory asserts that differences in interest rates between two countries are directly linked to the expected changes in exchange rates between their currencies. This relationship ensures that arbitrage opportunities do not persist in global markets. IRP assumes that investors will move their capital across borders to exploit higher returns until equilibrium is achieved.

The IRP theory operates on the assumption that capital markets are efficient, with minimal restrictions on the movement of funds. It presumes that investors have equal access to information and make rational decisions. Furthermore, the theory assumes that there are no significant transaction costs or barriers, such as exchange controls, which could distort capital flows.

Several scholars have supported the IRP theory in various contexts. Frenkel and Levich (1975) provided empirical evidence of IRP in developed financial markets, demonstrating its accuracy in predicting exchange rate movements. Dornbusch (1980) extended its relevance by integrating it into models of international monetary systems, emphasizing its utility in understanding global capital flows.

Despite its foundational role in international finance, the IRP theory has faced criticism. Aliber (1973) highlighted its limitations in markets with significant transaction costs or regulatory constraints, such as capital controls. Obstfeld and Rogoff (1996) argued that the theory does not account for market inefficiencies or the impact of macroeconomic instability, especially in developing economies. These criticisms underscore the challenges of applying IRP in less efficient or regulated markets.

The relevance of the IRP theory to this study lies in its ability to explain the interplay between interest rate variables—such as savings deposit rates, prime lending rates, and maximum lending rates—and financial performance. In Nigerian deposit money banks, the theory underscores the need to manage interest rate risks in a way that aligns with international benchmarks. However, given the imperfections in Nigeria's financial markets, the IRP theory must be applied with caution, considering local market dynamics and regulatory constraints.

### **2.3.2 Asset-Liability Management (ALM) Framework**

The Asset-Liability Management (ALM) framework, developed in the 1980s with notable contributions from Crouhy et al. (2001), provides a structured approach to managing the risks associated with mismatches between a financial institution's assets and liabilities. The framework emphasizes the importance of optimizing the balance sheet to mitigate risks such as interest rate fluctuations, liquidity shortages, and credit exposures. It is particularly vital for institutions like banks, which rely heavily on interest-sensitive assets and liabilities.

The ALM framework operates under several key assumptions. It assumes that financial institutions aim to achieve an optimal balance between assets and liabilities to maximize profitability while minimizing risks. The framework also assumes that interest rates, liquidity, and credit risks are the primary factors influencing financial

performance. Furthermore, it presupposes the availability of dynamic and data-driven approaches to address mismatches effectively.

Supporters of the ALM framework, such as Van Deventer et al. (2003), have emphasized its critical role in managing interest rate risks. Bessis (2011) argued that the framework enhances financial stability by providing institutions with tools to navigate volatile markets. These scholars highlight ALM's relevance in aligning financial institutions' strategies with market conditions.

Critics, however, point out certain limitations of the ALM framework. Choudhry (2018) argued that the framework often focuses too narrowly on interest rate risks, potentially neglecting other critical risks, such as operational and market risks. Saunders and Cornett (2020) highlighted that the framework's reliance on sophisticated modeling tools might limit its applicability in underdeveloped banking systems, such as those in emerging economies.

The relevance of the ALM framework to this study lies in its application to Nigerian deposit money banks, particularly in managing variables such as savings deposit rates, prime lending rates, and maximum lending rates. By using ALM strategies, these banks can effectively optimize their loan-to-deposit ratios and investments in treasury bills, thereby stabilizing net interest margins (NIM) and improving financial performance. However, the underdeveloped nature of Nigeria's financial markets necessitates adjustments to traditional ALM practices to account for local market challenges.

### **2.3.3 Efficient Market Hypothesis (EMH)**

The Efficient Market Hypothesis (EMH), propounded by Eugene Fama in 1970, posits that financial markets are "informationally efficient." According to this theory, asset prices at any given time fully reflect all available information, implying that no investor can consistently achieve higher-than-average returns through market timing or stock selection. The EMH categorizes market efficiency into three forms: weak, semi-strong, and strong, based on the type of information incorporated into asset prices.

The EMH operates under several assumptions. It assumes that markets are highly competitive and that investors respond rationally to new information. The theory also assumes that transaction costs are negligible and that information is freely available to all market participants. Additionally, it presupposes that investors cannot consistently outperform the market using historical data or public information.

Supporters of the EMH, such as Jensen (1978), have demonstrated its predictive accuracy in developed markets, emphasizing its relevance in understanding asset pricing. Malkiel (2011) also advocated for the theory, arguing that it justifies the adoption of passive investment strategies over active management.

Critics of the EMH, however, have challenged its assumptions and conclusions. Shiller (1981) argued that behavioral biases and market inefficiencies undermine the theory's validity. Lo (2004) introduced the Adaptive Market Hypothesis, suggesting that market efficiency is not constant but varies over time and across contexts. These critiques highlight the limitations of the EMH in explaining real-world market anomalies, particularly in less developed financial markets.

The relevance of the EMH to this study lies in its implications for interest rate management in Nigerian deposit money banks. The theory highlights the importance of transparency and the efficient dissemination of information in setting interest rates, such as savings deposit rates, prime lending rates, and maximum lending rates. However, inefficiencies in Nigeria’s financial markets, characterized by information asymmetry and regulatory challenges, limit the full applicability of the EMH, necessitating a localized approach to interest rate management and financial performance optimization.

In summary, the Asset-Liability Management (ALM) Framework is the most relevant theoretical framework for this study because it directly addresses the management of interest-sensitive assets and liabilities, which is central to understanding how interest rates affect financial performance in Nigerian deposit money banks. The framework emphasizes balancing assets and liabilities to mitigate risks such as interest rate fluctuations, liquidity mismatches, and credit exposures, aligning well with variables like savings deposit rates, prime lending rates, and net interest margin (NIM). Unlike broader theories like the Interest Rate Parity (IRP) and Efficient Market Hypothesis (EMH), the ALM framework focuses on internal strategies for optimizing financial performance, making it particularly suitable for navigating Nigeria's unique banking sector challenges. This practical approach ensures its relevance to the study's objectives.

### 3. Method

This study made use of the *Ex-post* facto research design. Sets of regression estimation techniques was applied to resolve the hypothesis stated while panel fully modified ordinary least square was employed to examine the magnitude and significance of the relationship among the research variables. The population of this study consist of all the twenty-four (24) deposit money banks in Nigeria as at December 31st 2024

A sample of ten banks was selected from the population of the study. The selected banks include WEMA bank, Unity Bank, Eco bank, Sterling Bank and Stanbic IBTC bank, Access bank, Guarantee Trust Bank, Polaris bank, Zenith Bank and United Bank of Africa. The sampling technique is the purposive sampling technique which is a direct way of obtaining the samples in which the researchers only consider typical cases which may quickly and easily provide the required information.

Data for this study were obtained from annual reports of selected banks covering the period between 2014 and 2023. The study's scope from 2014 to 2023 is justified by significant economic and regulatory changes in Nigeria's banking sector during this period. It captures the impact of economic volatility, banking reforms, and technological advancements on interest rate management and financial performance, ensuring the findings are relevant and reflective of recent trends in the sector. Secondary source was used in gathering data for this study. The secondary data for this study was collected and sourced from published financial statement of the selected ten (10) banks.

**Table 1:** Variable Definitions and Measurements

Variable	Acronym	Measurement	Source
Net Interest Margin	NIM	Ratio of net interest income to total interest-earning assets	English (2002); Puspitasari et al. (2021)

Prime Lending Rate	PLR	The benchmark interest rate at which banks lend to their most creditworthy customers	Ibrahim and Musa (2021); Olawale and Adeyemi (2020)
Maximum Lending Rate	MLR	The highest legally or regulatorily permitted lending interest rate	Singh and Rao (2021); Wennborg and Sandberg (2025)
Savings Deposit Rate	SDR	The interest rate paid by banks on savings deposit accounts	Satriyaningsih and Aliyah (2024); Idi and Jabil (2024)
Treasury Bill	TB	TB Volume or value of treasury bills held by banks, representing short-term government securities	Adebayo et al. (2022); Vandeweyer (2024)

### Model Specification

The model in this study follows the work of Adebayo et al. (2022) where they examined the nexus between treasury bill rates and deposit money banks' profitability in Nigeria. Taking cognizance of their models, the model for this study was coined and modified in respect to the objectives of the study and giving as:

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$$NIM = f(PLR, MLR, SDR, TB) \text{-----}$$

------(3.1)

Where:

NIM= Net Interest Margin

PLR= Prime Lending Rate

MLR= Maximum Lending Rate

SDR= Savings Deposit Rate

LTB = Log of Treasury Bill

Mathematically

$$NIM = \beta_0 + \beta_1 PLR + \beta_2 MLR + \beta_3 SDR + \beta_4 LTB + u \text{-----}$$

------(3.2)

To reduce some variables with a tenfold difference between two values to a twofold difference, some variables were log-transformed, while others were not because they were already expressed as rates. The model was then restructured into...

$$NIM = \beta_0 + \beta_1 PLR + \beta_2 MLR + \beta_3 SDR + \beta_4 LTD + \beta_4 LTB + u \text{-----}$$

--(3.3)

## 4. Results and Discussion

### 4.1 Pre-Estimation Test

**Table 2: Descriptive Statistics**

	<b>NIM</b>	<b>PLR</b>	<b>MLR</b>	<b>SDR</b>	<b>LTB</b>
Mean	5.7537	56.14907	26.6167	3.9203	15.927
Median	4.8300	1.1378	26.000	3.6000	16.827
Maximum	11.100	900.00	40.000	33.000	20.664
Minimum	3.3800	0.0000	14.000	2.1000	8.319
Std. Dev.	2.2199	173.7422	5.1736	2.990832	3.7328

Skewness	0.9942	3.3959	-0.0897	9.4131	-0.8691
Kurtosis	2.5263	14.13426	3.1258	92.132	2.4463
Jarque-Bera	17.236	701.6582	0.1979	34232.89	13.311
Probability	0.0002	0.000	0.9058	0.000	0.0013
Sum	569.62	5558.76	2635.0	388.11	1528.96
Sum Sq. Dev.	482.95	2958261.	2623.1	876.62	1323.7
Observ	99	99	99	99	99

**Source:** Authors' computation (2025) using E-views 9

Where NIM is Net Interest Margin, PLR is Prime Lending Rate, MLR is Maximum Lending Rate, SDR is Savings Deposit Rate, TB is Treasury Bill Holdings,

Table 2 presents the descriptive statistics result of the interest rate drivers and Net Interest Margin of deposit money banks in Nigeria. The variables used were log of Treasury Bills (LTB), net interest margin (NIM), Savings Deposit rate (SDR), Prime Lending rate (PLR) and Maximum Lending rate. Mean of NIM, LTB, SDR, PLR and MLR. were 5.754 15.926, 3.920, 56.149, 0.72455, 0.389 and 26.61667 respectively. The table shows that their mean is within the minimum and maximum, this invariably show that their mean is consistent. The skewness indicated that SDR, PLR and NIM, are positively skewed. The kurtosis implies the peakedness of the bell shape, hence NIM and TB are leptokurtic giving their value of below 3 while SDR, PLR and MLR are platykurtic as the values lies above 3. The coefficients of the Jarque-Bera (JB) statistical test signified that MLR were normally distributed at 5% significant Level.

#### 4.1.2 Correlation Analysis

**Table 3:** Correlation Matrix

	NIM	PLR	MLR	SDR	LTB
NIM	NIM	NIM	NIM	NIM	NIM
PLR		1		-0.0243	
MLR		-0.0525	1	-0.0462	
SDR				1	
LTB	0.2324	-0.0106	-0.1221	-0.0096	1

**Source:** Authors' computation (2025) using E-views 9

Table 3 presents the correlation coefficients of Savings Deposit Rate (SDR), Prime Lending Rate (PLR), Maximum Lending Rate (MLR), Net Interest Margin (NIM) and Log of Treasury Bills (LTB). The results show that the correlation between the variables were low, this shows that none of the independent variables has tendency of causing multicollinearity in the model since none of the correlations value is close to 1.00

#### 4.1.3 Panel Unit Root Test.

**Table 4:** PP - Fisher Chi-square Unit Roots Test Result

Var	Level & (P-value)	First Diff (P-value)	Order of Integration	Max. No Lags
NIM	0.51697 (0.6974)	-8.35323 (0.0000)	I (1)	2

PLR	-5.12664 (0.0000)***	-3.47159 (0.0003)	I (0)	2
MLR	41.2726 (0.0014)*	80.2646 (0.0000)***	I (0)	2
SDR	29.6610 (0.0755)	78.5447 (0.0000)	I (1)	2
LTB	0.84864 (0.8020)	-5.64899 (0.0000)***	I (1)	<b>2</b>

**Source:** Authors' computation (2025) using E-views 9

Table 4 reports the outcome for the Phillips-Perron panel unit root tests. The results show that the null hypothesis of the unit roots for the panel data for log of Treasury Bills (LTB), net interest margin (NIM), Savings Deposit rate (SDR), Prime Lending rate (PLR) and Maximum Lending rate cannot be rejected in the level. However, this hypothesis was rejected when the series are in their first differences. The result strongly indicates that the series were not stationary at their level but became stationary at their first differences. Also, MLR was stationary at the level, hence the null hypothesis of no unit root test was rejected at level.

#### 4.1.4 Panel Co-integration Test

**Table 5:** Pedroni Residual Cointegration Test

Series: NIM PLR MLR SDR LTB				
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	0.920016	0.1788	-0.607344	0.7282
Panel rho-Statistic	3.478478	0.9997	3.720589	0.9999
Panel PP-Statistic	-7.888488	0.0000	-6.138250	0.0000
Panel ADF-Statistic	-5.595321	0.0000	-3.588306	0.0002

**Source:** Authors' computation (2025) using E-views 9

Table 5 shows the result of co-integration test using Pedroni Residual Co-integration test. Like the former result, both PP and ADF was consistent as both show that there exists a long run relationship between the NIM and the explanatory variables given the Probability value of ADF and PP statistics to be less than 5% significance inference. The studies proceed to estimate the cointegration Regression test using the Fully Modified Ordinary Least Square technique.

## 4.2 Test of Hypotheses

### 4.2.1 Estimation of the effect of Interest rates on Net Interest Margin

Table 6: Estimation Result of the Effect of Interest Rates and Treasury Bill Holdings on Net Interest Margin

Dependent Variable: NIM				
Method: Panel Fully Modified Least Squares (FMOLS)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PLR	0.000102	0.000375	0.272909	0.7857
MLR	0.005919	0.021139	0.280016	0.7803
SDR	0.402508	0.171643	2.345023	0.0217
TB	-2.530000	5.650000	-0.447677	0.6557
R-squared	0.943368	F-statistic		6.264044***
Adjusted R-squared	0.932507	Chi-square		25.05617***

Long-run variance	0.323558
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**Source:** Authors' computation (2025) using E-views 9

Note: \*\*\* implies 5% significance level

The results presented in Table 6 estimate the effect of interest income drivers—specifically savings deposit rate (SDR), prime lending rate (PLR), maximum lending rate (MLR), and treasury bill holdings (TB)—on the net interest margin (NIM) of deposit money banks in Nigeria. The coefficients for SDR, PLR, and MLR are all positive, which aligns with theoretical expectations, indicating that increases in these rates are associated with improvements in net interest margin. In contrast, treasury bill holdings show a negative coefficient, which deviates from theoretical expectations. This suggests that greater investment in treasury bills may reduce NIM, possibly because such investments substitute more profitable lending activities.

In terms of magnitude, the savings deposit rate exerts the most substantial positive effect on NIM, with a coefficient of 0.4025. However, only SDR is statistically significant at the 5% level ( $p = 0.0217$ ), indicating a meaningful individual impact. The prime lending rate (PLR), maximum lending rate (MLR), and treasury bill holdings (TB) all show statistically insignificant effects, as their p-values exceed the 5% threshold.

The model demonstrates a high explanatory power, with an R-squared value of 0.943, implying that 94.3% of the variation in net interest margin is explained by the independent variables in the model. The adjusted R-squared is also high at 0.933, confirming the robustness of the model. Furthermore, the F-statistic, indicated by the Wald Chi-square value of 25.05617, is statistically significant at the 5% level, suggesting that the independent variables jointly have a significant effect on NIM. Therefore, the null hypothesis of no joint effect is rejected in favor of the alternative hypothesis, which posits that interest income drivers significantly influence the net interest margin of deposit money banks in Nigeria.

### 4.3 Discussion of Findings

The findings from Table 6 reveal that the savings deposit rate (SDR) has a positive and statistically significant effect on the net interest margin (NIM), indicating that an increase in SDR enhances NIM. This outcome aligns with theoretical expectations, as higher savings deposit rates attract more deposits, increase the availability of loanable funds, and potentially improve banks' interest income. This finding is consistent with Wambari and Mwangi (2017), who reported a positive relationship between interest rates and NIM in Kenya, and Kalsoom and Kashif (2016), who emphasized the importance of interest rate spreads in bank profitability in Pakistan. Similarly, Chaudron (2016) highlighted that net interest income is a core component of bank profitability, underscoring the need for effective interest rate management. However, this result contrasts with Peng and Shu (2013), who found a negative and significant relationship between lending rates and NIM in Hong Kong, and Bordo (2007), who noted that interest rate volatility compresses banks' interest margins in the United States.

The effects of the prime lending rate (PLR) and maximum lending rate (MLR) on NIM are positive but statistically insignificant. This suggests that although higher lending rates may theoretically enhance margins, factors such as loan demand sensitivity, competitive pricing, and regulatory constraints may mitigate their actual impact. This aligns with Chaudron (2016), who argued that interest rate changes influence

profitability indirectly. Nonetheless, this finding differs from that of Oladele et al. (2017), who reported a significant positive effect of lending rates on bank profitability in Nigeria.

Treasury bill holdings (TB) also exhibit a negative relationship with NIM, though the effect is statistically insignificant. The negative coefficient suggests that increased investment in treasury bills may crowd out lending activities and reduce net interest margins, possibly due to the lower returns from government securities compared to private sector lending. This result aligns with Enyioko (2012), who found that interest rate policies in Nigeria had minimal impact on bank performance. However, it contrasts with the findings of Oladele, Amos, and Adedeji (2017), who observed a significant positive relationship between treasury bill investments and bank profitability.

Overall, the model displays strong explanatory power, with an adjusted R-squared value of 93.3%, indicating that the independent variables jointly explain a substantial proportion of the variation in net interest margin. Moreover, the significant F-statistic confirms that the variables collectively exert a statistically significant effect on NIM, validating the rejection of the null hypothesis in favor of the alternative.

## **5. Conclusion and Recommendations**

This study examined the effect of interest income drivers including savings deposit rate (SDR), prime lending rate (PLR), maximum lending rate (MLR), and treasury bill holdings (TB) on the net interest margin (NIM) of deposit money banks in Nigeria between 2014 and 2023. The findings revealed that SDR had a positive and statistically significant effect on NIM, highlighting the importance of deposit mobilization in boosting bank profitability. Although PLR and MLR showed positive relationships with NIM, their effects were statistically insignificant, suggesting that broader regulatory or market factors may influence their effectiveness. Importantly, treasury bill holdings exhibited a negative but statistically insignificant relationship with NIM, indicating that higher allocations to government securities may reduce interest margins by diverting resources away from potentially more profitable lending opportunities. Based on the study's findings, the following recommendations are made in line with its objectives.

Since SDR showed a significant positive effect on net interest margin, banks should focus on offering competitive and sustainable savings rates to encourage deposit mobilization. More deposits increase the volume of loanable funds, which can be channeled into interest-earning assets. Regulatory authorities should also ensure monetary and inflationary stability to protect the real value of deposit returns.

Although both PLR and MLR showed positive but statistically insignificant effects, banks can still explore their potential by targeting lending strategies toward sectors that offer stable and high returns. Adjusting lending rates alone may not yield significant changes in NIM unless paired with strong credit risk assessments and tailored loan products.

The negative relationship between treasury bill holdings and NIM implies that over-reliance on government securities might reduce profitability. Banks should strike a balance between holding risk-free assets like treasury bills and allocating funds to productive lending activities. Treasury bills may serve liquidity or safety purposes, but excessive holdings can reduce income margins.

Since not all interest rate indicators significantly affect NIM individually, banks should adopt a comprehensive income strategy balancing deposit rate policies, loan pricing, and investment allocation. Innovative lending products, improved customer segmentation, and better interest rate risk management can help sustain and grow net interest margins over time.

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