Tax Avoidance and Earnings Management of Quoted Non-Financial Firms in Nigeria

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Abstract

This study investigates the relationship between tax avoidance and earnings management of listed non-financial firms in Nigeria. Using secondary data over the period from 2007 to 2022 of 75 of those firms on the floor of the Nigerian Exchange Group (NXG), the estimated generalized least squares (EGLS) results reveal that six of the variables (CUT, LGCUT, SHT, CT, ED and CTO) are positively and statistically significant with earnings management. This means the more managers engage in managing earnings, the higher the effective tax rates or the lower the tax they avoid. Five variables (LGCAT, BTD, PD, DBTD and PBTD) are negatively and statistically significant with earnings management. This means the more managers engage in managing earnings, the lower the effective tax rates or the higher the tax they avoid. Seven of the variables (LCUT, CAT, LCAT, HS, DT, BTDL and TO) are statistically not significant. This study draws conclusions and makes some recommendations.

1.0 Introduction

Financial statements are crucial tools for assessing a company's performance and are prepared and presented by all organizations, profit- or non-profit, operating in any society. The purpose of these financial statements is to keep management accountable to interested parties, including the government, investors, creditors, managers, and shareholders, to name but a few. Im and Nam (2019) emphasized that a business's excellent financial reports may draw the interest of additional investors and affect the cost of financing for that company. According to the IASB (2010) Conceptual Framework, high-quality financial reporting data will positively influence capital providers and other stakeholders when they make decisions about credit, investments, and other resource allocations. This will greatly boost market efficiency overall. Thus, the purpose of financial statements is to provide reliable and pertinent information to those who heavily depend on them in order to make well-informed business decisions.

According to Umaru (2014), inaccurate financial reporting encourages managers to manipulate or manage earnings to their personal benefit or to satisfy investor expectations, just as an excessive reliance on such manipulated accounting numbers lead investors to make poor business decisions. Earnings management is one important concept in accounting research for over four decades now. Earnings management is the term used to characterize the practice of managers manipulating earnings. The worldwide phenomena known as "earnings management" typically happens when managers feel pressured to meet or exceed pre-established criteria for earnings that management or investors have set. Healy and Whalen (1999) in their definition stated that "earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the company's underlying economic performance or to influence contractual outcomes that are dependent on reported accounting numbers," In other words, earnings management refers to the dishonest behavior of managers who purposefully manipulate financial statements by applying discretion in transaction structuring in order to either achieve a contractual benefit based on reported accounting numbers or to deceive the firm's stakeholders about the true economic picture of the firm. Therefore, it is earnings management when managers engage in activities like satisfying analyst expectations, minimizing losses, or "smoothing out" or maintaining a growing trend in order to meet targets (Healy & Whalen, 1999).
One of the reasons managers engage in the manipulation of earnings is through tax avoidance (Desai, 2003). Tax avoidance (TA) refers to the legal tactics, strategies, arrangements, or procedures, plans, or methods used by taxpayers to make sure that their tax obligations—which are meant to represent their fair part of the public's overall tax burden—are minimized.

The public views TA as unacceptable, despite the fact that numerous judicial rulings view it as not being criminal. This may have a detrimental impact on the company's overall worth due to reputational damage, fines paid in cash, political expenses, poor financial reporting, etc. Herusetya and Stefani (2020) noted that TA is an interesting topic because of its economic consequences on firms' profitability and earnings quality since managers who accurately report high profits pay high taxes and those who manipulatively report lower taxable income are faced with penalties when caught by the tax authorities.

According to Amidu and Yorke (2017), previous studies noted that agency theory was largely used to explain the relationship between TA and earnings management because of the conflict of interest between managers and shareholders as opportunistic managers adopt TA tactics to divert rent to themselves through earnings management; and this expropriated wealth from shareholders frequently have a negative impact on equity value. Desai and Dharmapala (2009) reported earlier that managers are encouraged by shareholders to use their best efforts to minimize taxes since TA adds value to them as a value transfer technique from the State to shareholders. Nonetheless, they again noted that opportunistic management also uses TA to pursue their self-serving goals and manage profits in ways that enrich managers at the expense of shareholders.
Several studies that have linked TA and EM found strong relationship between them both in developed economy (Karjalainen et al., 2023; Floropoulos et al., 2023) and developing economy

(Ndum (2022; Rajput & Jahanzeb, 2022) with mixed outcomes. For examples, while some found a positive relationship (Abubakar et al. (2021); Ndum (2022); others found a negative relationship (Karjalainen et al.(2023); Floropoulos et al. (2023) or still no relationship at all (Salah (2021). For as much as the results from previous studies have shown mixed outcomes, the main objective of this study is to investigate the impact which TA may have on EM of quoted non-financial firms in Nigeria. This study differs from others in that it uses seventeen (17) variables to measure tax avoidance. While Rajput and Jahanzeb (2022) used two measures of tax avoidance which are: cash effective tax rate (CETR) and book effective tax rate (BETR); others used only one variants of TA measurements. Although Rajput and Jahanzeb (2022) in Pakistan used a time span of 19 years from 2000 to 2018, this study uses a more recent period of 16 years from 2007 to 2022. We, therefore, hypothesized that all the various TA measurements considered in this study have no significant relationship with earnings management of quoted non-financial firms in Nigeria. Following this introduction, the rest of the paper is divided into five sections with the literature review in section two, methodology in section three, discuss of results in section four and the fifth section concludes this paper with recommendations.

2.0 Review of Related Literature.

2.1 Theoretical Underpinning.

2.1.1 Political Costs Theory and Earnings Management.

Political costs are expenses that a business incurs as a result of a political action conducted by an external agency like the government, a union, or community organizations. These political expenses have an effect on the company's profitability, giving managers the chance to decrease or reduce political costs by altering profits. The political cost theory asserts that managers of businesses under regulatory scrutiny are driven to minimize profits by managing or manipulating accounting accruals in order to reduce the likelihood and/or severity of these political costs (Turegun & Nida, 2017). For example, managers can raise reserves for upcoming inventory obsolescence to reduce profitability and related political costs. Reduced political expenditures enhance cash flows through tax savings, which boosts the company's stock price. As stock prices increase, owners' personal wealth increases, but managers also benefit because their compensation is tied to share price through stock options. Therefore, in the case of political expenses, tax avoidance via earnings management might be considered as advantageous to both investors and managers.

2.2 Empirical Literature

Karjalainen et al.(2023) analyzed the relationship between tax avoidance and earnings management in Finland. A panel data on all Finnish dividend-paying SMEs companies spanning the period 2006 to 2010 was used in the study. Results of the pooled OLS showed that tax avoidance represented by cash effective tax rate was positively significant with discretionary accrual (DACC) which is a proxy for earnings management. This means that tax avoidance is negatively related to earnings management and so managers' opportunistic behavior in reporting of financial and taxable income is reduced.

Floropoulos et al. (2023) undertook a review of sixty extant literatures to ascertain if tax avoidance represented by book-tax conformity had any impact on earnings management in across the globe. The overall results of the study showed that book-tax conformity generally impacted negatively and significantly on earnings management. This means that tax avoidance is positively related to earnings management and so managers' opportunistic behavior in reporting of financial and taxable income is increasing.

Rajput and Jahanzeb (2022) carried out an empirical assessment if there is any relationship between tax avoidance and earnings management in Pakistan. Secondarily sourced panel data obtained on 189 non-financial firms spanning the period from 2000 to 2018 for 3,591 firm-year observations was used. Results of the pooled OLS showed that tax avoidance represented by both cash effective tax rate (CETR) and book effective tax rate (BETR) were negatively significant with discretionary accrual (DACC) which is a proxy for earnings management.

Ndum (2022) studied the relationship, if any, that existed between tax avoidance and earnings management in Nigeria. An annual secondary panel data of selected 9 deposit money banks (DMBs) over the period from 2010 to 2020 was used. The OLS regression result revealed that tax avoidance CETR was positively significant with discretionary accrual (DACC) which is a proxy for earnings management.

Abubakar et al. (2021) examined the impact which tax avoidance has had on earnings real management in Nigeria. Secondarily sourced data from the annual reports of listed 72 non-financial firms from 2014 to 2018 were analyzed with the OLS regression method. The results indicated that tax avoidance CETR relationship with real earnings management was positively significant.

Salah (2021) studied how earnings management can be influenced by tax planning in Egypt. A sample of 127 listed companies on the Thomson Reuters Eikon database was selected covering the period 2012 to 2018 making 889 firm-year observations. The results of the OLS multiple regressions showed that tax planning represented by effective tax rate (ETR) exerted insignificant influenced on earnings management.

Thanjunpong et al. (2020) investigated whether tax planning had any effect on earnings management of listed firms in Thailand. Secondary data collected from the annual reports of 414 companies were tested spanning the period from 2016 to 2018. Results of the OLS revealed that ETR had a positively significant relationship with Kothari et al. (2005)'s model of discretionary accruals as earnings management representative meaning the more managers engage in earnings management, the higher the ETR.

Sebastian et al. (2020) empirically tested the extent to which tax avoidance represented by book-tax conformity impacted tax-induced earnings management of listed firms in Europe. A panel data on 426,593 firm-year observations from 23 EU countries over the period 2005 to 2013 was used and analyzed with the OLS regression method. The results revealed that book-tax conformity had a negatively significant relationship with tax-induced earnings management. This means that as the tax rates increases, firms engaged in earnings management so as to reduce their book-tax conformity.

Herusetya and Stefani (2020) attempted to ascertain the extent to which tax aggressiveness impacted earnings management in Indonesia. A sampled data of 500 firm-year observations of listed firms in Indonesian Stock Exchange (IDX) between 2013 and 2017 was used. Result showed that while the ETR relationship with DACC was positively significant; ETR relationship with real activities earnings management was negatively significant

Susanto et al. (2019) , in a research study, sought to verify if at all the tax aggressiveness mitigate the practices of earnings management in Indonesia. Using the data of 132 firms listed on the IDX from 2013 to 2017, the OLS regression results found out that ETR was negatively related with DACC meaning that tax aggressiveness increases opportunistic earnings management by managers.

3.0 Methodology

3.1 Research Design

Using the ex-post facto research design, often referred to as the descriptive or correlational research design, the study investigates if there is any relationship between ownership structure and firm performance of companies in Nigeria. The population of the study consists of 106 non-financial enterprises listed on the floor of the Nigerian Exchange Group (NXG). In order to conduct this study, secondary data from 75 out of 106 organizations' annual reports were gathered over a period of sixteen (16) years, from 2007 to 2022, totaling 1,200 observations.

3.2 Measurement and Definitions of Variables.

Table1

S/N		Definitions	Variable Types	Measurements
1	DACC	Discretionary Accruals	Dependent	See 3.2.1 for Details
2	CUT	Current Effective Tax Rate (Current ETR)	Independent	See 3.2.2 for Details
3	LCUT	Long-Run Current ETR	Independent	See 3.2.2 for Details
4	LGCUT	Lagged Current ETR	Independent	See 3.2.2 for Details
5	CAT	Cash Effective Tax Rate (Cash ETR)	Independent	See 3.2.2 for Details
6	LCAT	Long-Run Cash ETR	Independent	See 3.2.2 for Details
7	LGCAT	Lagged Cash ETR	Independent	See 3.2.2 for Details

8	HS	Henry and Sansing's (2014) Measure.	Independent	See 3.2.2 for Details
9	SHT	Tax Shelter Score	Independent	See 3.2.2 for Details
10	CT	Conforming Tax Avoidance	Independent	See 3.2.2 for Details
11	DT	Discretionary Tax	Independent	See 3.2.2 for Details
12	BTD	Book-Tax-Differences (BTD)	Independent	See 3.2.2 for Details
13	BTDL	BTD Lagged Total Assets	Independent	See 3.2.2 for Details
14	PD	Permanent Difference	Independent	See 3.2.2 for Details
15	PBTD	Total Permanent Book-Tax-Differences (BTD)	Independent	See 3.2.2 for Details
16	DBTD	Discretionary Book-Tax-Differences (BTD) or Abnormal Book-Tax-Differences	Independent	See 3.2.2 for Details
17	ED	ETR Differential	Independent	See 3.2.2 for Details
18	TO	Tax Expense/Operating Cash Flow	Independent	See 3.2.2 for Details
19	CTO	Cash Tax Expense Paid/ Operating Cash Flow	Independent	Percentage Change in annual Sales
20	ΔSALES	Change in Sales	Control	Total value of cash flows from Operations
21	OCF	Operating cash flows	Control	Market value of equity (MVE) plus Book value of debt(BVD)/ Book value of assets(BVA)
22	TQ	Tobin'sQ	Control	Total amount spent on Research & Development divided by total assets.
23	CAPEX	Capital expenditure	Control	Amount spent of capital projects.

24	FI	Foreign Income	Control	Income earned outside the shores of Nigeria
25	CASH	Cash and cash equivalent/TA	Control	Total value of Cash and cash equivalent divided by total assets.
26	LEV	Leverage	Control	Total debts/ Total assets
27	YDUM	Year Fixed Effect Dummy	Control	A dummy variable which takes the value '1' for each year
28	IDUM	Industry Sector Fixed Effect Dummy	Control	A dummy variable which takes the value '1' for each industry

Source: Researcher's Computations from Extant Literature.

3.2.1. Derivation of the Dependent Variable (Discretionary Accruals)

Earning management is measured from the perspective of discretionary accrual. Beginning with Healy (1985); DeAngelo (1986); according to Lee and Vetter(2015), earnings management models have passed through major changes since Jones(1991); Dechow et al.(1995); Kang and Sivaramakrishnan (1995); Kasznix(1999); Dechow and Dichev (2002); Kothari et al.(2005); to mention but a few. In this study, we use the Kasznix (1999) model.

The Kazsnix's (1999) Model is as stated below:

$$\frac{TACCit}{TAit-1} = \alpha 1 + \frac{1}{\text{TAit}-1} + \alpha 2\frac{\Delta REVit - \Delta RECit}{\text{TAit}-1} + \alpha 3\frac{PPEit}{\text{TAit}-1} + \alpha 4\frac{ROAit}{\text{TAit}-1} + \alpha 5\frac{\Delta CFOit}{\text{TAit}-1} + \varepsilon it$$

where: $TACC_{it}$ = Total accruals for firm i in year t.
TA_{t-1} = Total assets for firm i in year t-1
ΔRev_{it}= Change in revenues for firm i in year t

ΔRec_{it} = Change in receivables for firm i in year t.

PPE_{it} = Gross property plant and equipment for firm i in year t.

ROA_{it-1} = Return on assets for firm i in year t-1, that is, lag of one year.

ΔCFO_{it} = Change in cash flow from operations for firm i in year t

3.2.1.1. Step by Step Derivation of the Dependent Variable (Discretionary Accruals)

The following steps are taken into considerations in order to calculate the discretionary accruals. For examples, to derive the Kazsnix's Model (1999):
Step1: Calculate the total accruals as follows:

$$TACC_{it}/TA_{t-1} = (\Delta CA_{it} - \Delta Cash_{it} - \Delta CL_{it} + \Delta DCL_{it} - DEP_t)/TA_{t-1} \ldots\ldots\ldots Eq1$$

where: $TACC_{it}$ = Total accruals for firm i in year t
ΔCA_{it} = Change in current assets for firm i in year t
$\Delta Cash_{it}$ = Change in cash and cash equivalent for firm i in year t
ΔCL_{it} = Change in current liabilities for firm i in year t

ΔDCL_{it} = Change in short term debt included in current liabilities for firm i in year t
DEP_{it} = Depreciation and amortization for firm i in year t
TA_{it-1} = Total assets for firm i in year t-1, that is, lag of one year.

Step2: Estimate the Kazsnix's Model (1999) below using the Ordinary Least Squares (OLS) regression technique.

$$\frac{TACCit}{TAit-1} = \alpha 1 + \frac{1}{\text{TAit}-1} + \alpha 2\frac{\Delta REVit-\Delta RECit}{\text{TAit}-1} + \alpha 3\frac{PPEit}{\text{TAit}-1} + \alpha 4\frac{ROAit}{\text{TAit}-1} + \alpha 5\frac{\Delta CFOit}{\text{TAit}-1} + \varepsilon it \qquad Eq2$$

where: α_1, α_2 and α_3 = Parameters or coefficients to be estimated to derive $\hat{a}_1$ $\hat{a}_2$ $\hat{a}_3$, the estimated parameters
$\boldsymbol{\varepsilon_{it}}$ = Residuals or error terms for firm i in year t

Step3. Thereafter, we shall calculate the non-discretionary accruals (NDACC) by replacing α_1, α_2 and α_3 with $\hat{a}_1$ $\hat{a}_2$ $\hat{a}_3$ in equations 2 above without, $\boldsymbol{\varepsilon_{it}}$, the error terms as:

$$NDACC_{it}/TA_{t-1} = \hat{a}1 + \frac{1}{\text{TAit}-1} + \hat{a}2\frac{\Delta REVit-\Delta RECit}{\text{TAit}-1} + \hat{a}3\frac{PPEit}{\text{TAit}-1} + \hat{a}4\frac{ROAit}{\text{TAit}-1} + \hat{a}5\frac{\Delta CFOit}{\text{TAit}-1}$$

where: $NDACC_{it}/TA_{t-1}$ = Non-discretionary accruals for firm i in year t scaled/divided by total assets for firm i in year t-1

Step4: Finally, we shall calculate the discretionary accruals as total accruals less non-discretionary accruals. The non-discretionary accruals is also known as the "normal" accruals.
$DACC_{it}/TA_{t-1} = TACC_{it}/TA_{t-1} - NDACC_{it}/TA_{t-1}$ …….Eq3

This discretionary accrual (DACC), also known as "abnormal" accruals, is used as the proxy for Earnings Management.

3.2.2 Derivation of the Independent Variables (Tax Avoidance)

3.2.2.1 Current Effective Tax Rate (Current ETR)

The current tax is the item of tax payable shown in the financial statement of a firm which is determined by the generally accepted accounting principles (GAAP). It is made up of current year tax expense only. Current effective tax rate is usually calculated as the current tax expense in a particular year divided by pre-tax book income or profit before tax in that year

$$\text{Current ETR} = \frac{\text{Current Year Tax Expense}}{\text{Pre-Tax Income or Profit Before Tax}}$$

3.2.2.2 Cash Effective Tax Rate (Cash ETR)

The cash tax is the actual tax paid or payable to the Federal Inland Revenue Services (FIRS) which is based on the reported amount on FIRS‘s tax return each year. The book tax and the cash tax do produce different results due to differences in policy objectives, and this lead to the concept of timing differences which are temporary difference and permanent difference. Cash effective tax rate is usually calculated as the cash tax expense paid in a particular year divided by pre-tax book income or profit before tax in that year

$$\text{Cash ETR} = \frac{\text{Cash Tax Expense Paid}}{\text{Pre-Tax Income or Profit Before Tax}}$$

$$\text{3.2.2.3. Long-Run GAAP ETR} = \frac{\text{Total Sum of Book Tax Expense Paid over n (3,5,10) years}}{\text{Total sum of Pre-Tax Income or Profit Before Tax}}$$

This is the cumulative number of book tax payable shown in the financial statement of a firm which is determined by the generally accepted accounting principles (GAAP)

$$\text{3.2.2.4.Long-Run Current ETR} = \frac{\text{Total Sum of Current Year Tax Expense Paid over n (3,5) years}}{\text{Total sum of Pre-Tax Income or Profit Before Tax}}$$

This is the cumulative number of current year tax payable shown in the financial statement of a firm which is determined by the generally accepted accounting principles (GAAP)

$$\text{3.2.2.5.Long-Run CASH ETR} = \frac{\text{Total Sum of Cash Tax Expense Paid over n (3,5,10) years}}{}$$

Total sum of Pre-Tax Income or Profit Before Tax

This is the cumulative number of the actual tax paid or payable to the Federal Inland Revenue Services (FIRS) which is based on the reported amount on FIRS's tax return each year.

3.2.2.6.Lagged GAAP ETR = Book Tax Expense or Total Income Tax Expense / Lag1 of Pre-Tax Income or Profit Before Tax_{t-1}

Lagged book effective tax rate is usually calculated as the total tax expense in a particular year divided by pre-tax book income or profit before tax of the immediate previous or preceding year

3.2.2.7.Lagged Current ETR = Current Year Tax Expense / Lag1 of Pre-Tax Income or Profit Before Tax_{t-1}

Lagged current effective tax rate is usually calculated as the current tax expense in a particular year divided by pre-tax book income or profit before tax of the immediate previous or preceding year

3.2.2.8.Lagged Cash ETR = Cash Tax Expense Paid / Lag1 of Pre-Tax Income or Profit Before Tax_{t-1}

Lagged cash effective tax rate is usually calculated as the cash tax expense paid in a particular year divided by pre-tax book income or profit before tax of the immediate previous or preceding year.

3.2.2.9.Conforming Tax Avoidance (TaxC)

Conforming tax avoidance measurement is the residuals (ε) obtained from either of the following regression equations:

Taxes paid/Total assets $= \beta 0 + \beta 1 \text{Cash\_Etr}_{it} + \beta 2 NOL_{it} + \beta 3 \Delta NOL_{it} + \varepsilon_{it}$

OR

Taxes paid/Total assets $= \beta 0 + \beta 1 \text{Cash\_Etr}_{it} + \varepsilon_{it}$

where NOL = net operating loss and equals 1 NOL is non-zero.
ΔNOL = change in net operating loss.

3.2.2.10. HS (Henry and Sansing's 2014) Measure.

$$HS = \frac{\Delta}{MVA} = \frac{\text{Cash Tax Paid} - (\text{Statutory Tax Rate} * \text{Profit Before Tax})}{MVA}$$

where MVA = book value of assets + (market value of equity -book value of equity) = BVA+ (MV E - BV E)

Book-Tax-Differences (BTD) Based Measures

3.2.2.11. $$BTD/BTG = \text{Profit Before Tax} - \frac{\text{(Current Tax Expense)}}{\text{Statutory Tax Rate}}$$

3.2.2.12. $$BTDLaggedTA = \frac{\text{Book-Tax-Differences}}{\text{Lagged Total Assets or Total Assets}_{t-1}}$$

3.2.2.13. Discretionary Book-Tax-Differences (DBTD) or Abnormal Book-Tax-Differences

$$\frac{\text{Book-Tax-Differences}}{\text{Total Assets}_{t-1}} = \beta 0 + \beta 1 * \frac{\text{Total Accruals}}{\text{Total Assets}_{t-1}} + \varepsilon_{it}$$

3.2.2.14. Total Permanent Book-Tax-Differences (BTD)

a) $$\text{Total Permanent BTD} = \text{Total BTD} - \frac{\text{(Deferred Tax Expense)}}{\text{Statutory Tax Rate}}$$

OR

b) Total Permanent BTD = (Statutory Tax Rate – Effective Tax Rate)* PBT

3.2.2.15. ETR Differential Measures.

ETR Differential = Statutory Income Tax Rate – Firms' Effective Tax Rate.

3.2.2.16. Discretionary permanent differences (DTAX) can be derived through the estimation and extraction of the residuals or error terms from the following regression equation:

a) $PERMDIFF = \beta o + \beta_1 INTANG + \beta_2 UNCON + \beta_3 MI + \beta_4 CSTE + \beta_5 \Delta NOL + \beta_6 LAGPERM + \varepsilon_{it}$

where:

$$\text{PERMDIFF} = \text{PBT} - \frac{\text{(Current Tax)}}{\text{Statutory Tax Rate}} + \frac{\text{(Current Foreign Tax)}}{\text{Statutory Tax Rate}} - \frac{\text{(Deferred Tax)}}{\text{Statutory Tax Rate}}$$

INTANG = Goodwill and other intangibles; UNCON = Income (loss) reported under the equity method; MI = Income (loss) attributable to minority interest; CSTE = Current state income tax expense; NOL = Change in net operating loss carry forwards; LAGPERM = One-Year Lag of PERMDIFF or PERMDIFF_{t-1}

That is, the portion of the ETR differential which is usually unexplained

b) It can also be derived as the error term extracted from the following regression equation:
ETR differential*Pre-tax book income (PBT) = $\beta 0 + \beta 1 \text{Controls} + \varepsilon_{it}$

Thus, while the ETR differential measures the difference between a firm's statutory income tax rate and its effective tax rate (ETR), DTAX which is the discretionary permanent difference measures the unexplained portion of ETR differential as developed by Frank et al. (2009).

3.2.2.17. SHELTER :

a) This is an indicator variable used when a firm is accused and found guilty of engaging in any tax shelter activity

b) Alternatively, the probability that a firm may be engaged in tax sheltering can be computed as follows:

$$\text{Tax Shelter Score (TSS)} = -4.30 + 6.63 * \text{BTD} - 1.72 * \text{LEV} + 0.66 * \text{SIZE} + 2.26 * \text{ROA} + 1.62 * \text{FOREIGN INCOME} + 1.56 * \text{R\&D}$$

where: $\text{BTD} = \text{Book-Tax-Differences} = \text{Profit Before Tax} - \frac{\text{(Current Tax Expense)}}{\text{Statutory Tax Rate}}$

LEV = Leverage = Total Debts / Total Assets; SIZE = Log of Total Assets; ROA = PBT/Total Assets; Foreign Income = Income earned outside the shores of Nigeria; R&D = Research & Development Expenditures / Total Assets.

3.2.2.18. Tax Expenses-To-Operating Cash Flow = $\frac{\text{Tax Expenses}}{\text{Operating cash Flow}}$

3.2.2.19. Cash Tax Expenses Paid-To-Operating Cash Flow = $\frac{\text{Cash Tax Expenses Paid}}{\text{Operating cash Flow}}$

3.3 Model Specification

The functional equation of investment efficiency to test the eighteen (18) hypotheses specified is stated as in equation 1:

DACC = f (CUT, LCUT, LGCUT, CAT, LCAT, LGCAT, HS, SHT, CT, DT, BTD, BTDL, PD, PBTD, DBTD, ED, TO, CTO)
(Eq1)

3.3.1. Universal Usage of Control Variables in Published Scholarly Articles From High Quality Journals.

Traditionally, control variables (CVs) are used in research models that have causal relationship. The two main ways of controlling for variables are by experimental design (before gathering the data) where the samples are manipulated or by statistical control (after gathering the data) where the researcher just includes relevant variables in the model. Some of the reasons for controlling are to eliminate omitted variables biases thereby reducing the error term which in turn increase statistical power by improving the estimated coefficients precision (De Battisti & Siletti, 2018). Cinelli et al. (2022) was of the opinion that while some data analysts, students as well as empirical social scientists have discussed the problem of omitting certain relevant variables, they have not provided a means of deciding which variables could improve or worsen existing biases in a regression model. According to Becker (2005), CVs are just as important as the predictors (independent) variable and the criterion (dependent) variable because one author‘s CV could be another author‘s predictor‘s or criterion variable such that including improperly any CV can produce misleading results. Hunermund and Louw (2020) noted that over 47 percent of scholarly papers published the previous five years in top management journals made use of CVs. They pointed out that they were specifically as authors asked to hypothesized and interpret CV coefficients as though these CVs were focal main variables for as much as the CVs could give valuable information to other researchers.

Therefore, introducing the three firm-specific control variables give rise to equation 2 as:
DACC = f (CUT, LCUT, LGCUT, CAT, LCAT, LGCAT, HS, SHT, CT, DT, BTD, BTDL, PD, PBTD, DBTD, ED, TO, CTO, ΔSALES, OCF, TQ, RD, CAPEX, FI, CASH, LEV)
(Eq2)

Eq2 becomes Eq3 when the year dummy and industry sector dummy variables are introduced to control for specific fixed effect.

DACC = f (CUT, LCUT, LGCUT, CAT, LCAT, LGCAT, HS, SHT, CT, DT, BTD, BTDL, PD, PBTD, DBTD, ED, TO, CTO, ΔSALES, OCF, TQ, CAPEX, FI, CASH, LEV, YDUM, IDUM)
(Eq3)

The functional testable model will be derived as:

$$DACC = \beta o + \beta_1 CUT + \beta_2 LCUT + \beta_3 LGCUT + \beta_4 CAT + \beta_5 LCAT + \beta_6 LGCAT + \beta_7 HS + \beta_8 SHT + \beta_9 CT + \beta_{10} DT + \beta_{11} BTD + \beta_{12} BTDL + + \beta_{13} PD + \beta_{14} PBTD + \beta_{15} DBTD + \beta_{16} ED + \beta_{17} TO + \beta_{18} CTO + \beta_{19} \Delta SALES + \beta_{20} OCF + \beta_{21} TQ + \beta_{22} CAPEX + \beta_{23} FI + \beta_{24} CASH + \beta_{25} LEV + \beta_{26} YDUM + \beta_{27} IDUM + \varepsilon \quad \text{(Eq4)}$$

Since we are using panel data, the model will be specified in the appropriate form as:

$$DACC_{it} = \beta o + \beta_1 CUT_{it} + \beta_2 LCUT_{it} + \beta_3 LGCUT_{it} + \beta_4 CAT_{it} + \beta_5 LCAT_{it} + \beta_6 LGCAT_{it} + \beta_7 HS_{it} + \beta_8 SHT_{it} + \beta_9 CT_{it} + \beta_{10} DT_{it} + \beta_{11} BTD_{it} + \beta_{12} BTDL_{it} + \beta_{13} PD_{it} + \beta_{14} PBTD_{it} + \beta_{15} DBTD_{it} + \beta_{16} TO_{it} + \beta_{17} TO_{it} + \beta_{18} CTO_{it} + \beta_{19} \Delta SALES_{it} + \beta_{20} OCF_{it} + \beta_{21} TQ_{it} + \beta_{22} CAPEX_{it} + \beta_{23} FI_{it} + \beta_{24} CASH_{it} + \beta_{25} LEV_{it} + \beta_{26} YDUM_{it} + \beta_{27} IDUM_{it} + \varepsilon_{it} \quad \text{(Eq5)}$$

3.4 Data Analysis using Estimated Generalized Least Squares (DEGLS) Technique:

The ordinary least squares (OLS) has been an important method of prediction ever known to mankind since it was invented in 1795 by the mathematician Carl Friedrich Gauss, and later on rediscovered and popularized by another mathematician known as Adrien-Marie Legendre in 1805 (ClockBackward, 2009). The OLS regression model is built on certain assumptions such that if any of these assumptions are violated, then OLS estimator may no longer be Best Linear Unbiased Estimate (BLUE) and so the generalized least squares (GLS) was developed towards the mid-twentieth centuries by Alexander Aitken in 1936 (Virgantari et al., 2019). The GLS regression is an extension of the normal linear OLS estimation designed with some level of unequal error variances (heteroscedastic), not equal or constant variance (homoscedastic) and correlations between the residuals or error terms (serial correlation) in mind. The GLS and OLS estimators are the same in the absence of autocorrelation and heteroskedasticity and so they differ with respect to the error term assumptions which the GLS estimator was improvised to tackle. Thus, the GLS estimator is a generalization of the OLS estimator which transforms it to a new estimator that is more efficient, consistent, unbiased and asymptotically normal (Priya & Riya, 2017).

Where the definitions are as stated in Table2 above.

β_1 to β_{27} are the beta coefficients of the instrumental, independent and control variables. From this study, we expect β_1 to β_{27} to be greater than zero.

ε_{it} = Error term for year 'i' in year 't'

4.0. Method of Data Analysis

Data collected are analyzed using EViews 13 in the following order: univariate data analyses or descriptive statistics; bivariate data analysis or correlation analysis; unit root test; estimation of the models; performance of some additional analysis and diagnostics tests.

4.1 Univariate Data Analyses (Descriptive Statistics)

The statistics in Table 2 below, which is based on equation1 above, show that the mean values of the variables as well as the maximum values. Since the mean values are lower than the maximum values, it confirms that there are no outliers in our data. The Jarque-Bera Statistics and its Probability of 0.000000 for all the variables show that the distribution is not normal. However, Ghasemi and Zahediasl (2012) noted that, in accordance with the central limit theorem (CLT), violating the normality assumption shouldn't be a significant problem once the observation is 100 and above. Our observation is 1200, and so normality assumption does not matter here.

Table 2

	CUT	LCUT	LGCUT	CAT	LCAT	LGCAT	HS	SHT	CT	DT	BTD	BTDL	PD	PBTD	DBTD	TO	CTO
Mean	28.41207	28.14844	0.005524	5.530824	5.462284	0.001618	-0.002269	85236828	0.049476	3.488793	13385550	-632756.7	-1736220.	2.63E+09	-0.037527	-0.832211	1.097195
Median	0.234280	0.233224	9.80E-08	0.114606	0.114089	5.08E-08	-2.41E-05	-555511.2	0.010278	29.79864	-91018.67	-0.021867	-333574.2	-2097339.	5.329508	0.095311	0.041641
Maximum	4999.629	4999.629	1.900848	1554.618	1554.618	0.619970	0.360785	1.51E+09	9.164608	3531.019	2.27E+08	31.94717	9.74E+08	8.12E+11	37.30079	1921.230	278.3477
Minimum	-3501.019	-3501.019	1.737220	-14.91429	-14.91429	0.635256	0.823931	1.17E+10	28.45530	-4969.629	1.76E+09	7.24E+08	1.07E+09	1.56E+12	-4866.435	-1450.528	33.08271
Std. Dev.	292.8138	292.7491	0.096175	54.42231	54.37980	0.033974	0.039524	7.73E+08	1.303585	292.8173	1.17E+08	21401600	71895968	6.64E+10	144.4436	76.38837	14.59514
Skewness	8.502263	8.510284	5.041430	21.76152	21.81426	3.861028	13.12776	-11.26012	16.05772	-8.392334	-11.14806	-33.77870	-4.215355	-15.56748	-33.47692	7.204512	15.04827
Kurtosis	158.9096	159.0806	273.4475	585.9320	587.8733	259.0059	259.4084	143.9572	312.7741	159.1549	141.5533	1142.001	129.4029	383.6057	1128.169	469.8119	242.7095
Jarque-Bera	1172455.	1175024.	3491274.	16287887	16396391	3126870.	3166717.	971260.6	4623257.	1175750.	938754.3	62056613	764991.3	6951232.	60559894	10397098	2782134.
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	32503.41	32201.81	6.319594	6327.263	6248.853	1.850706	-2.596143	9.75E+10	56.60001	3991.179	1.53E+10	7.24E+08	1.99E+09	3.01E+12	-42.93101	-952.0489	1255.191
Sum Sq. Dev.	98000737	97957435	10.57228	3385323.	3380037.	1.319271	1.785544	6.83E+20	1942.337	98003094	1.57E+19	5.24E+17	5.91E+18	5.03E+24	23847485	6669614.	243479.8
Observations	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200

Source: Researcher's Computations (2023) Using EViews13 Software.

4.2 Bivariate Data Analysis (Correlation Analysis)

The correlation analysis among the variables, which is based on equation1 above, are meant to first determine the association between each pair of the dependent and independent variables as well as among the explanatory variables. The degree of association may be weak (0.00 to 0.5), moderate (0.51 to 0.8) or high (0.81 and above). A very high association among the regressors poses a problem of multi-collinearity (Gujarati, 2003)

Table 3

Covariance Analysis: Ordinary
Date: 01/04/24 Time: 09:03
Sample: 2007 2022
Included observations: 1200
Balanced sample (listwise missing value deletion)

Covariance Correlation	CUT	LCUT	LGCUT	CAT	LCAT	LGCAT	HS	SHT	CT	DT	BTD	BTDL	PD	PBTD	DBTD	TO	CTO
CUT	85664.9 1.00																
LCUT	85619.7 0.99	85627.1 1.00															
LGCUT	9.47918 0.34	9.49138 0.34	0.00924 1.00														
CAT	-2795.0	-2809.8	0.7600	2959.19													

	0	0								
	-0.18	-0.17	0.15	1.00						
	-	-								
	2809.3	2807.8	0.7640	2954.2	2954.5					
LCAT	1	7	8	0	7					
	-0.18	-0.17	0.15	0.99	1.00					
LGCAT	0.7446	0.7487	0.0029	0.6224	0.6237	0.0011				
	8	1	7	5	5	5				
	0.08	0.08	0.91	0.34	0.34	1.00				
				-	-					
	1.3000	1.2995	9.01E-	0.5030	0.5031	-	0.0015			
HS	5	4	5	2	5	3.42E-	6			
	0.11	0.11	0.02	-0.23	-0.23	-0.03	1.00			
	-	-	-	-	-		-			
	1.45E	1.45E	89887	4.00E	3.98E	11462	17268	5.97E		
SHT	+1	+1	7.	+0	+0	5.	0.	+1		
	-0.06	-0.06	-0.01	-0.01	-0.01	0.00	-0.06	1.00		
	-	-	-	-	-	-	-	-		
	44.009	44.138	0.0158	4.0520	4.0934	0.0116	0.0015	10636	1.6978	
CT	6	4	8	7	6	8	2	3	4	
	-0.12	-0.12	-0.13	-0.06	-0.06	-0.26	-0.03	-0.01	1.00	
			0.1564		132.05	0.0457	0.0929	-	-	85667.
DT	692.9	686.1	1	133.8	8	2	1	1.71E	1.6406	0

	0.01	0.01	0.01	0.01	0.01	0.00	0.01	+1 -0.08	2 -0.00	1.00						
BTD	- 2.17E +0 -0.06	- 2.17E +0 -0.06	- 13290 7. -0.01	- 58130 1 -0.01	- 57906 6 -0.01	18078. 9 0.00	- 26037 1. -0.06	9.03E +1 0.99	- 16395 0. -0.01	- 2.60E +0 -0.08	- 1.37E +1 1.00					
BTDL	17021 12 0.00	16854 30 0.00	3495.0 9 0.00	34901 4. 0.00	34467 7. 0.00	1023.5 7 0.00	- 1420.1 2 -0.00	- 2.05E +1 0.00	- 39707. 2 -0.00	- 16775 14 -0.00	- 3.42E +1 -0.00	4.58E +1 1.00				
PD	1.58E +0 0.01	1.59E +0 0.01	30124. 9 0.00	20280 2 0.01	21360 7 0.01	1203.1 8 0.00	- 75390. 4 -0.03	1.02E +1 0.18	45670. 1 0.00	- 9.37E +0 -0.04	1.48E +1 0.18	9.39E +1 0.00	5.16E +1 1.00			
PBTD	1.51E +0 0.7	9.69E +0 0.99	79749 0. 0.00	1.13E +1 0.00	1.11E +1 0.00	41439 4. 0.00	- 1.08E +0 -0.04	- 2.81E +1 0.55	- 1.70E +0 -0.00	- 3.86E +1 -0.20	- 4.25E +1 0.55	- 1.53E +1 -0.01	1.53E +1 0.32	4.40E +2 1.00		
DBTD	139.46 1 0.00	138.03 7 0.00	- 0.0373 8 -0.00	- 40.487 8 -0.01	- 40.857 3 -0.01	- 0.0313 5 -0.01	- 0.0263 6 -0.00	- 2.98E +0 -0.00	- 5.3514 9 0.03	- 97.683 4 -0.00	- 47742 31 -0.00	- 23667. 0 -0.7	- 17941 7. 0.00	- 1.12E +1 -0.00	20845. 7 1.00	
TO	2243.6	2243.4	0.1905	-	-	-	1.2426	-	-	34.557	-	-	13505	-	-	5830.0

	7	0	3	802.659	802.726	0.07350	4	3.06E+0	1.72659	4	46715 14	75762 5.	7	6.14E+0	26.1993	8	
	0.10	0.10	0.03	-0.22	-0.22	-0.03	0.41	-0.01	-0.02	0.00	-0.01	-0.00	0.00	-0.00	-0.00	1.00	
CTO	-838.436	-838.156	0.08091	328.509	328.581	0.03077	-0.3315	1.30E+0	-1.1615	41.8637	20114 1	69198 3.	-14818 2.	2.55E+0	11.536 4	-403.842	212.832
	-0.206359	-0.196337	0.05769 1	0.41394 5	0.41435 9	0.06211 7	-0.5751 87	0.01150	0.06110 4	0.00980 4	0.01170	0.00221 7	0.00014 1	0.00264 0	0.00547 7	0.36253 3	1.00000 0

Source: Researcher's Computations (2023) Using EViews13 Software.

From Table 3 above, all the variables have weak associations and this attest to the fact that there is no problem of multicollinearity among the variables except those of LCUT to CUT(0.99969)' LCAT to CAT(0.99909) and LGCAT to LGCUT(0.91145) which are highly. correlated.

4.3. Unit Root Test.

Once the EViews workfile has been structured in panel data form, we can go ahead and perform a panel data unit root test as shown in Table 4 below.

Table 4

Variables	Augmented Dickey Fuller test-Statistic	Phillip-Perron test-Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Order of Integration or stationarity
DACC	-12.1244	-10.3491	-3.9657	-3.4135	-3.1288	I(0) stationary
CUT	-12.5909	-18.3695	-3.9657	-3.4135	-3.1288	I(0) stationary
LCUT	-12.5466	-17.5046	-3.9657	-3.4135	-3.1288	I(0) stationary
LGCUT	-12.7665	-22.6580	-3.9657	-3.4135	-3.1288	I(0) stationary
CAT	-19.9244	-29.5555	-3.9657	-3.4135	-3.1288	I(0) stationary
LCAT	-19.7777	-28.4866	-3.9657	-3.4135	-3.1288	I(0) stationary
LGCAT	-17.2035	-22.9464	-3.9657	-3.4135	-3.1288	I(0) stationary
HS	-14.9164	-19.9034	-3.9657	-3.4135	-3.1288	I(0) stationary
SHT	-7.1931	-11.5287	-3.9657	-3.4135	-3.1288	I(0) stationary
CT	-13.9908	-14.1531	-3.9657	-3.4135	-3.1288	I(0) stationary
DT	-12.5368	-17.4934	-3.9657	-3.4135	-3.1288	I(0) stationary
BTD	-8.6383	-11.4511	-3.9657	-3.4135	-3.1288	I(0) stationary
BTDL	-34.2654	-34.2654	-3.9657	-3.4135	-3.1288	I(0) stationary
PD	-9.61106	-41.5848	-3.9657	-3.4135	-3.1288	I(0) stationary
PBTD	-8.7554	-25.9247	-3.9657	-3.4135	-3.1288	I(0) stationary
DBTD	-33.6753	-33.6753	-3.9657	-3.4135	-3.1288	I(0) stationary
ED	-28.6753	-23.6753	-3.9657	-3.4135	-3.1288	I(0) stationary
TO	-11.2367	-28.9174	-3.9657	-3.4135	-3.1288	I(0) stationary
CTO	-8.7322	-18.7586	-3.9657	-3.4135	-3.1288	I(0) stationary
ΔSALES	-24.7630	-43.8278	-3.9657	-3.4135	-3.1288	I(0) stationary

OCF	-10.4206	-31.7739	-3.9657	-3.4135	-3.1288	I(0) stationary
TQ	-28.5156	-28.5156	-3.9657	-3.4135	-3.1288	I(0) stationary
RD	-9.5241	-12.5948	-3.9657	-3.4135	-3.1288	I(0) stationary
CAPEX	-10.1306	-16.5314	-3.9657	-3.4135	-3.1288	I(0) stationary
FI	-9.0641	-16.5937	-3.9657	-3.4135	-3.1288	I(0) stationary
CASH	-21.2031	-27.6336	-3.9657	-3.4135	-3.1288	I(0) stationary
LEV	-23.3001	-10.3289	-3.9657	-3.4135	-3.1288	I(0) stationary

Source: Researcher's Computations (2024) Using EViews13 Software.

The results of the Augmented Dickey Fuller (ADF) test-Statistic as well as that of the Phillip-Perron (PP) test-Statistic for all the variables of interest are reported in Table 4 above. The results showed that the two test statistics (ADF & PP) are greater than all the tabulated critical values at the 1% Critical Value, 5% Critical Value and 10% Critical Value. This means that all the variables of interest are I(0), that is, stationary at levels. When variables are not stationary, it means that they can drift apart on the long run and the regression results obtained can be spurious or nonsensical. We never computed a unit root test for the dummy variables (IDUM, YDUM) because the data were arbitrarily generated. Thus we can use the ordinary least squares (OLS) method of estimation.

4.4 Regression Models Estimation Results.

Table 5. Dependent Variable:DACC
Method: Panel EGLS (Period SUR)
Date: 01/04/24 Time: 15:21
Sample: 2007 2022
Periods included: 16
Cross-sections included: 75
Total panel (unbalanced) observations: 1200
Linear estimation after one-step weighting matrix
Period SUR (PCSE) standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUT	326.8042	48.78722	6.698562	0.0000
LCUT	-0.014355	0.015382	-0.933242	0.3509
LGCUT	19.40629	0.973174	19.94123	0.0000

CAT	-0.038127	0.061081	-0.624195	0.5326
LCAT	0.033038	0.061087	0.540834	0.5887
LGCAT	-34.75936	2.654088	-13.09654	0.0000
HS	0.482362	1.529091	0.315457	0.7525
SHT	4.60E-09	6.53E-10	7.038742	0.0000
CT	0.637032	0.024696	25.79489	0.0000
DT	2.53E-05	8.51E-05	0.296702	0.7667
BTD	-2.06E-08	4.26E-09	-4.844738	0.0000
BTDL	2.61E-10	1.01E-09	0.257519	0.7968
PD	-2.15E-08	6.93E-10	-30.97472	0.0000
PBTD	-1.69E-12	2.37E-13	-7.158272	0.0000
DBTD	-0.000896	0.000176	-5.103449	0.0000
ED	326.7918	48.78724	6.698305	0.0000
TO	-0.000447	0.000533	-0.839418	0.4014
CTO	0.007330	0.003059	2.396535	0.0167
C	-9803.714	1463.637	-6.698189	0.0000

Weighted Statistics			
R-squared	0.830621	Mean dependent var	-0.061888
Adjusted R-squared	0.827911	S.D. dependent var	1.994014
S.E. of regression	0.827593	Sum squared resid	770.5231
F-statistic	306.4952	Durbin-Watson stat	1.800133
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.249360	Mean dependent var	-0.194822
Sum squared resid	24762.85	Durbin-Watson stat	1.460746

Source: Researcher's Computations (2023) Using EViews13 Software.

Table 5 above shows the regression estimation results of the relationship between tax avoidance and earnings management of 75 listed non-financial firms in Nigeria based on equation 1above.

4.5 Discussion of the Regression Estimation Results and Hypotheses Testing.

From Table 5 above, both the R^2 (0.830621) and the Adj R^2 = (0.827911) indicate that about 83% of systematic variations in investment efficiency is accounted for by CUT, LCUT, LGCUT, CAT, LCAT, LGCAT, HS, SHT, CT, DT, BTD, BTDL, PD, PBTD, DBTD, ED, TO and CTO.
The remaining 17 % can be explained by other factors not captured by the model. The F-statistic (306.4952) and a Prob(F-stat.) of 0.000000 confirm that there is a joint statistical significant of a

linear relationship between the variables (dependent and independent). With a Durbin-Watson stat of 1.800133, the model is freed from serial correlation.

Looking at the independent variables (CUT, LCUT, LGCUT, CAT, LCAT, LGCAT, HS, SHT, CT, DT, BTD, BTDL, PD, PBTD, DBTD, ED, TO and CTO) reveal that five of the variables (CUT, SHT, CT, ED and CTO) are positively and statistically significant with earnings management. The results means that the higher the levels of earnings management, the higher the firms' effective tax rate. This concludes that firms with increasing earnings management levels are not likely to engage in any tax avoidance activity. Another five variables (LGCAT, BTD, PD, DBTD and PBTD) are negatively and statistically significant with investment efficiency. The results means that the higher the levels of earnings management, the lower the firms' effective tax rate. This concludes that firms with increasing earnings management levels are more likely to engage in tax avoidance activity. Seven of the variables (LCUT, CAT, LGCAT, HS, DT, BTDL and TO) are statistically not significant. This means that there is no link between tax avoidance and earnings management.

Specifically, CUT relationship with DACC is positively significant with a coefficient of 326.8042, a t-Statistic of 6.698562 and a p-value of 0.0000. This suggests that an increase in LCUT will increase DACC. The results means that the higher the levels of earnings management, the higher the firms' current effective tax rate. This concludes that firms with increasing earnings management levels are not likely to engage in any tax avoidance activity. The sign or direction is contrary to our expectations but the size or magnitude is in line with our expectations. We, therefore, reject the null hypothesis of no significant relationship and accept the alternative hypothesis that there is a significant relationship between CUT and DACC.

LGCUT relationship with DACC is positively significant with a coefficient of 19.40629, a t-Statistic of 19.94123 and a p-value of 0.0000. This suggests that an increase in LGCUT will increase DACC. The result means that the higher the levels of earnings management, the higher the firms' lagged current effective tax rate. This concludes that firms with increasing earnings management levels are not likely to engage in any tax avoidance activity. The sign or direction is contrary to our expectations but the size or magnitude is in line with our expectations. We, therefore, reject the null hypothesis of no significant relationship and accept the alternative hypothesis that there is a significant relationship between LGCUT and DACC.

LGCAT relationship with DACC is negatively significant with a coefficient of -34.75936, a t-Statistic of -13.09654 and a p-value of 0.0000. This means that as LGCAT decreases, DACC increases. This suggests that the more firms reduce their lagged current effective tax rates, the more managers are likely to engage in opportunistic earnings behaviour. The sign or direction as well as the size or magnitude is aligned with our expectations. We, therefore, reject the null hypothesis of no significant relationship between the SHT and DACC and accept the alternative that SHT has a significant relationship with DACC.

SHT relationship with DACC is positively significant with a coefficient of 4.60E-09, a t-Statistic of 7.038742 and a p-value of 0.0000. This suggests that an increase in SHT will increase DACC. The results mean that the higher the levels of tax shelter activity, the higher the firms' earnings management. This concludes that firms with tax shelter activity levels are not likely to engage in any earnings management. The sign or direction is contrary to our expectations but the size or magnitude is in line with our expectations. We, therefore, reject the null hypothesis of no significant relationship and accept the alternative hypothesis that there is a significant relationship between SHT and DACC.

CT relationship with DACC is positively significant with a coefficient of 0.637032, a t-Statistic of 25.79489 and a p-value of 0.0000. This suggests that an increase in CT will increase DACC. The results mean that the higher the levels of conforming tax, the higher the firms' earnings management. This concludes that firms with conforming tax levels are not likely to engage in any earnings management. The sign or direction is contrary to our expectations but the size or magnitude is in line with our expectations. We, therefore, reject the null hypothesis of no significant relationship and accept the alternative hypothesis that there is a significant relationship between CT and DACC.

BTD relationship with DACC is negatively significant with a coefficient of -2.06E-08, a t-Statistic of -4.844738 and a p-value of 0.0000. This means that as BTD decreases, DACC increases. This suggests that the more firms reduce their book tax difference rates, the more managers are likely to engage in opportunistic earnings management. The sign or direction as well as the size or magnitude is aligned with our expectations. We, therefore, reject the null hypothesis of no significant relationship between the BTD and DACC and accept the alternative that SHT has a significant relationship with DACC.

PD relationship with DACC is negatively significant with a coefficient of -2.15E-08, a t-Statistic of -30.97472 and a p-value of 0.0000. This means that as PD decreases, DACC increases. This suggests that the more firms reduce their permanent difference tax rates, the more managers are likely to engage in opportunistic earnings management. The sign or direction as well as the size or magnitude is aligned with our expectations. We, therefore, reject the null hypothesis of no significant relationship between the PD and DACC and accept the alternative that PD has a significant relationship with DACC.

PBTD relationship with DACC is negatively significant with a coefficient of -1.69E-12, a t-Statistic of -7.158272 and a p-value of 0.0000. This means that as PBTD decreases, DACC increases. This suggests that the more firms reduce their permanent book tax difference tax rates, the more managers are likely to engage in opportunistic earnings management. The sign or direction as well as the size or magnitude is aligned with our expectations. We, therefore, reject the null hypothesis of no significant relationship between the PBTD and DACC and accept the alternative that PBTD has a significant relationship with DACC.

DBTD relationship with DACC is negatively significant with a coefficient of -2.15E-08, a t-Statistic of -30.97472 and a p-value of 0.0000. This means that as DBTD decreases, DACC increases. This suggests that the more firms reduce their discretionary or absolute book tax difference tax rates, the more managers are likely to engage in opportunistic earnings management. The sign or direction as well as the size or magnitude is aligned with our expectations. We, therefore, reject the null hypothesis of no significant relationship between the DBTD and DACC and accept the alternative that DBTD has a significant relationship with DACC.

ED relationship with DACC is positively significant with a coefficient of 326.7918, a t-Statistic of 6.698305 and a p-value of 0.0000. This suggests that an increase in ED will increase DACC. The results mean that the higher the levels of ETR differential tax rates, the higher the firms' earnings management tendencies. This concludes that firms with ETR differential tax rates levels are not likely to engage in any earnings management. The sign or direction is contrary to our expectations but the size or magnitude is in line with our expectations. We, therefore, reject the null hypothesis of no significant relationship and accept the alternative hypothesis that there is a significant relationship between ED and DACC.

CTO relationship with DACC is positively significant with a coefficient of 0.637032, a t-Statistic of 25.79489 and a p-value of 0.0000. This suggests that an increase in CTO will increase DACC. The results mean that the higher the levels of cash effective tax-to-operating cash flow, the higher the firms' earnings management engagement. This concludes that firms with cash effective tax-to-operating cash flow levels are not likely to engage in any earnings management. The sign or direction is contrary to our expectations but the size or magnitude is in line with our expectations. We, therefore, reject the null hypothesis of no significant relationship and accept the alternative hypothesis that there is a significant relationship between CTO and DACC.

4.6 Residual Diagnostic Tests of No Cross Sectional Dependence

An increasing number of literatures on panel-data conclude that panel-data models are likely to substantially exhibit cross-sectional dependence in the errors. This may be due to the presence of common shocks and some other unobserved components that may eventually become part of the error term. According to De Hoyos and Sarafidis (2006), the past few decades have witnessed an ever-growing economic and financial integration among countries and this signifies strong interdependencies among cross-sectional units. Thus, there is the tendency for individuals to respond in a similar manner to common "shocks", or some common unobserved factors due to neighborhood effects, herd behavior, social norms and genuinely interdependent preferences (De Hoyos & Sarafidis, 2006). Rodríguez-Caballero (2016) also noted that if cross-sectional dependence exists in a panel data model, it can complicate statistical inference and any estimators that do not take such into account could be inconsistent even if the number of cross section dimension N is large with a finite time dimension T .

The above necessitate us to test for cross-sectional dependence as such testing is very important in fitting panel-data models. The results of the cross sectional dependence tests in Table 6 below show that at least one of the test statistics-Breusch-Pagan LM and Pesaran CD-accept the null hypotheses of no cross sectional dependence in the residuals since the results of Pesaran CD test-Statistic (0.623854) has a P-value (0.5327) which is greater than 5% .We, therefore, conclude that there is no cross-dependence in the residuals

Table 6. Residual Cross-Section Dependence Test
Null hypothesis: No cross-section dependence (correlation) in weighted
residuals
Equation: Untitled
Periods included: 16
Cross-sections included: 75
Total panel (unbalanced) observations: 1200
Note: non-zero cross-section means detected in data
Test employs centered correlations computed from pairwise samples

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	5872.794	2775	0.0000
Pesaran scaled LM	41.58206		0.0000
Pesaran CD	0.623854		0.5327

Source: Researcher's Computations (2023) Using EViews13 Software.

4.7 Additional Analysis for Robustness Checks using the Control Variables.

To test the robustness of the base regression results, we include both the firm-specific control variables (ΔSALES, OCF, TQ, RD, CAPEX, FI, CASH and LEV) as well as the industry-year fixed effect control variables (YDUM and IDUM) as stated in equations 2, 3, 4 and 5. The result is shown in Table 7 below.

Table 7. Dependent Variable: DACC
Method: Panel EGLS (Period SUR)
Date: 01/04/24 Time: 14:14
Sample: 2007 2022
Periods included: 16
Cross-sections included: 75
Total panel (unbalanced) observations: 1200
Linear estimation after one-step weighting matrix
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUT	365.5299	58.79068	6.217479	0.0000
LCUT	-0.325488	12.59661	-0.025839	0.9794
LGCUT	19.57512	1.142729	17.13015	0.0000
CAT	-0.981399	38.09660	-0.025761	0.9795
LCAT	0.974623	38.09662	0.025583	0.9796
LGCAT	-36.37567	3.003896	-12.10950	0.0000
HS	0.943847	1.758312	0.536792	0.5915
SHT	-2.22E-07	3.56E-08	-6.236022	0.0000
CT	0.682366	0.027380	24.92222	0.0000
DT	4.93E-05	0.000105	0.467979	0.6399
BTD	1.48E-06	2.36E-07	6.276268	0.0000
BTDL	-1.09E-06	2.82E-06	-0.385915	0.6996
PD	-2.36E-08	7.05E-10	-33.40640	0.0000
PBTD	-1.95E-12	3.14E-13	-6.209635	0.0000
DBTD	-0.000988	0.000268	-3.690467	0.0002
ED	365.2063	57.42652	6.359541	0.0000
TO	-0.000695	0.000451	-1.542125	0.1233
CTO	0.010667	0.003586	2.974385	0.0030
_SALES	-3.52E-10	2.55E-10	-1.379694	0.1680
OCF	-2.70E-09	3.77E-10	-7.151678	0.0000
TQ	6.07E-05	0.000157	0.386157	0.6995
CAPEX	1.27E-09	3.43E-10	3.696557	0.0002
FI	3.72E-07	5.75E-08	6.481243	0.0000
CASH	-1.93E-09	7.92E-10	-2.441803	0.0148
LEV	0.004173	0.000576	7.242022	0.0000
YDUM	0.016321	0.007706	2.118060	0.0344
IDUM	0.030379	0.023584	1.288140	0.1980
C	-10956.42	1722.815	-6.359606	0.0000

Weighted Statistics

R-squared	0.813034	Mean dependent var	-0.065315
Adjusted R-squared	0.808285	S.D. dependent var	1.868408
S.E. of regression	0.818594	Sum squared resid	712.3125
F-statistic	171.2043	Durbin-Watson stat	1.780354
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.272770	Mean dependent var	-0.222304
Sum squared resid	23847.45	Durbin-Watson stat	1.493904

Source: Researcher's Computations (2024) Using EViews13 Software.

The results in Table 7 above are exactly the same as that of Table 5 above. A comparative analysis of the two results shows that the following variables (LCUT, CAT, LCAT, HS, DT, BTDL and TO) are not statistically significant for both the model with control variables and the model without control variables while the rest are significant. This shows the robustness of these results in deciding how tax avoidance has helped the firms to engaging in earnings management for the period under consideration.

Conclusion and Recommendations

This study investigates the relationship between tax avoidance and earnings management of listed non-financial firms in Nigeria. Using secondary data over the period from 2007 to 2022 of 75 of those firms on the floor of the Nigerian Exchange Group (NXG), the estimated generalized least squares (EGLS) results reveal that six of the variables (CUT, LGCUT, SHT, CT, ED and CTO) are positively and statistically significant with earnings management. This means the more managers engage in managing earnings, the higher the effective tax rates or the lower the tax they avoid. Five variables (LGCAT, BTD, PD, DBTD and PBTD) are negatively and statistically significant with earnings management. This means the more managers engage in managing earnings, the lower the effective tax rates or the higher the tax they avoid.. Seven of the variables (LCUT, CAT, LCAT, HS, DT, BTDL and TO) are statistically not significant.

Based on the results above, the study recommends the followings:

- Management should continue to engage in legal tax avoidance since it can save fund from it such that there is no need for any opportunistic management of earnings.
- Management should nevertheless consider the extra costs implications from tax audit and reputational loss when tax avoidance is on the extreme side of the continuum.
- Tax authorities should be abreast with the latest tax avoidance strategies so as to design laws relevant to plugging the loopholes and thus save fund for developmental purposes.
- Shareholders should also be aware of the agency problem involved in both tax avoidance and earnings management by placing greater emphasis on internal control measures, such as the role of the risk management committee.

References

Abubakar, A. H., Mansor, N. & Wan-Mohamad, W. I. A. (2021). Corporate tax avoidance, free cash flow and real earnings management: Evidence from Nigeria. *Universal Journal of Accounting and Finance, 9(1),* 86 - 97.

Amidu, M. and Yorke, S.M. (2017). Tax avoidance and earnings management of firms in Ghana: Does the funding strategy matter?', *Int. J. Critical Accounting, 9*(3), 238–264.

Becker, T. E. (2005). Potential problems in the statistical control of variables in organizational research: A qualitative analysis with recommendations. *Organizational Research Methods, 8 (3),* 274-289.

Cinelli, C., Forney, A. & Pearl, J. (2022).A crash course in good and bad controls. Forthcoming, *Journal Sociological Methods and Research*, 1-30.

ClockBackward (2009).Ordinary least squares linear regression: flaws, problems and pitfalls |.http://www.clockbackward.com/2009/06/18/ordinary-least-squares-linea...

De Battisti, F. & Siletti, E. (2018.).On the use of control variables in PLS-SEM. *(n. p.)*

De Hoyos, R. E. &Sarafidis, V. (2006) Testing for cross-sectional dependence inpanel-data models. *The Stata Journal*

Desai, M. A. (2003). The divergence between book income and tax income. *Tax policy and the economy*, *17*, 169-206.

Desai, M.A. & Dharmapala, D. (2009b). Earnings management, corporate tax shelters, and book-tax alignment', *National Tax Journal*, 62(1), 169–186.

Floropoulos, S., Tsipouridou, M. & Spathis, C. (2023). Book-tax conformity and earnings management: A research agenda. Retrieved from: Electronic copy available at: https://ssrn.com/abstract=4445012

Ghasemi, A. & Zahediasl, S. (2012) Normality tests for statistical analysis: A guide for non-statisticians. Int J Endocrinol Metab ;10:486-9.

Gujarati, D. (2003). Basic econometrics (4th ed.). McGraw-Hill. New York.

Healy, P. M., & Wahlen, J. M. (1999). A review of earnings management literature and its implications for standard setting. *Accounting Horizon, 13*(4), 365-383.

Herusetya, A. & Stefani, C. (2020). The association of tax aggressiveness on accrual and real earnings management. *Journal of Accounting and Investment, 21*(3), 434-451.

Hunermund, P. & Louw, B. (2020).On the nuisance of control variables in regression analysis, *(n. p.)*, 1-17

IASB(2010) Conceptual framework for financial reporting. Available from: http://www.ifrs.org/News/Press-Releases/Documents/ConceptualFW2010vb.pdf

Im, C. & Nam, G. (2019) Does ethical behavior of management influence financial reporting quality? *Sustainability, 11*, 1-16.

Karjalainen , J , Kasanen , E , Kinnunen , J. & Niskanen , J. (2023). Dividends and tax avoidance as drivers of earnings management: Evidence from dividend-paying private SMEs in Finland. *Journal of Small Business Management, 61(2)*, 906-937 .

Lee, B. B. & Vetter, W. (2015) Critical evaluation of accrual models in earnings management studies. *Journal of Accounting and Finance ,15(1)*, 62-71

Ndum, N, B.(2022). Effect of tax avoidance on earnings management in Nigerian deposit money banks. *Research Journal of Management Practice, 2(4)*, 1-16.

Priya, C. & Riya, J. (2017). How to conduct generalized least squares test? https://www.projectguru.in/conduct-generalized-least-squares-test/

Rajput, S. K. O. & Jahanzeb (2022). Tax avoidance and earning management in Pakistan. Electronic copy available at: https://ssrn.com/abstract=3491107

Rodríguez-Caballero, C. V. (2016)Panel data with cross-sectional dependence characterized by a multi-level factor structure.*Aarhus University Repository.*

Salah, W. (2020). Does deferred tax mediate the relationship between tax planning and earnings management? *(n. p.)*, 1-20

Sebastian, E., Martin, J., Nadine, K. & Kelly, W. (2020). *Tax-induced earnings management and book-tax conformity: International evidence from unconsolidated accounts.* Arqus Discussion Paper, No. 252, Arbeitskreis Quantitative Steuerlehre (arqus), Berlin, 1-48

Susanto, Y. K., Pirzada, K., Adrianne, S. (2019).Is tax aggressiveness an indicator of earnings management? *POLISH JOURNAL OF MANAGEMENT STUDIES, 20(2)*, 516-527

Thanjunpong, S., Bangmek, R. & Waenkaeo, K. (2020). The relationship between tax planning and earnings management of public limited company in Thailand, *Parichart Journal Thaksin University*, *34(2)*, 67-81

Turegun, N. & Nida, C. T. K. (2017). Associations between earnings management manipulation types and debt contracts, political costs and characteristics of board of directors. *International Journal of Academic Research in Accounting, Finance and management Sciences, 7(2),* 208-214.

Umaru, D. (2014) *Audit attributes and financial reporting quality of listedbuilding material firms in Nigeria*. Ahmadu-Bello University Repository, Zaria

Virgantari, F., Wijayanti, H. & Koeshendrajana, S. (2019). Aitken's generalized least square method for estimating parameter of demand function of animal protein in Indonesia. *Journal of Physics: Conf. Series 1245*.doi:10.1088/1742-6596/1245/1/012045