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EXPLORING THE LINK BETWEEN CAPITAL STRUCTURE AND TAX AGGRESSIVENESS IN NIGERIA

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Abstract: This study investigated the impact of capital structure on tax aggressiveness of listed manufacturing companies in Nigeria. The hypothesis was tested using data from the annual report of 39 manufacturing companies listed on the Nigerian Exchange Group from 2013 to 2022. The study was anchored on agency theory and trade-off theory. Diagnostic tests such as heteroskedasticity and the Hausman test were conducted. Applying Fixed Effects regression, the result shows that leverage and firm size negatively and significantly impact on tax aggressiveness. At the same time, external audit and revenue growth exert a positive and negative but insignificant influence on tax aggressiveness. Securities and Exchange Commission in Nigeria should encourage firms to maintain optimal leverage levels to mitigate tax aggressiveness, while ensuring transparency in external auditing to enhance tax compliance among listed manufacturing companies.

Keywords: Tax aggressiveness, capital structure, manufacturing companies, Nigeria

1.1 Introduction

Tax aggressiveness has become a critical area of interest globally, driven by the increasing need for governments to enhance revenue generation amidst evolving economic and political landscapes. As a primary source of government income, taxes are vital for funding development projects and public services. However, corporate tax aggressiveness, characterised by strategies aimed at minimising tax liabilities, has led to significant revenue losses, particularly in developing economies like Nigeria. Manufacturing firms in Nigeria have been identified as key players in aggressive tax practices, posing a challenge to the government's revenue mobilisation efforts and threatening economic stability. While tax planning can enhance shareholder value, excessive tax avoidance undermines public finance, resulting in regulatory scrutiny and potential penalties. Despite the prevalence of tax aggressiveness, research on the influence of capital structure on tax behaviour in Nigeria remains limited. This study seeks to fill this gap by examining how leverage, external audit, firm revenue growth, and firm size influence tax aggressiveness among listed manufacturing firms in Nigeria.

1.2 Statement of the Problems

Tax aggressiveness among manufacturing firms in Nigeria remains a persistent challenge, undermining the government's ability to generate adequate revenue for economic growth and development. While tax planning is a legitimate strategy to minimise expenses, excessive tax avoidance adversely affects public finance and places undue pressure on compliant taxpayers. The proliferation of corporate tax aggressiveness reflects a critical gap in regulatory oversight and enforcement, further exacerbated by limited research on the role of firm-specific attributes in shaping tax behaviour. Prior studies in Nigeria have primarily examined the impact of corporate governance and financial performance on tax aggressiveness, with minimal attention given to capital structure variables such as leverage and firm size. Firms with higher debt levels or substantial physical assets may have more significant incentives and opportunities to engage in tax-aggressive behaviour through interest deductions and accelerated depreciation (Ribeiro, Cerqueira, & Brandão, 2015; Kraft, 2014). Given the scarcity of localised research on this topic, there is a pressing need to explore how capital structure influences tax aggressiveness in Nigeria's manufacturing sector. Also, the empirical literature extensively explores the relationship between firm characteristics such as size, profitability, leverage, growth, and tax aggressiveness across various jurisdictions. Most studies adopt agency or political cost theories to explain corporate tax behaviours. However, the findings are inconsistent and contextspecific. Several studies (Rani et al., 2018; Ryandono et al., 2020; Salman et al., 2018) conducted in Indonesia and Malaysia reveal mixed results regarding the influence of firm size and leverage on tax aggressiveness. While Rani et al. (2018) and Salman et al. (2018) find that firm size negatively impacts tax avoidance, Ryandono et al. (2020) and Putra et al. (2018) report no significant effect of leverage. These inconsistencies point to jurisdictional differences and variations in regulatory environments. Studies focusing on Nigeria (Ogbeide, 2017; Mgbame et al., 2017) provide limited insight. Findings suggest that firm size positively influences tax aggressiveness while leverage reduces it. However, these studies primarily cover non-financial firms and short timeframes, leaving gaps in the analysis of manufacturing firms, a sector crucial to Nigeria's industrial landscape. Moreover, studies such as Jong et al. (2017) and Ribeiro et al. (2015) offer perspectives from developed economies (Korea and the UK) where tax policies and enforcement mechanisms differ significantly from emerging markets like Nigeria. The insights from these developed markets may not fully capture the nuances of tax behaviour in Nigeria, where regulatory frameworks are evolving.

Identified Gaps:

1. **Sectoral Focus** – Limited studies specifically examine the manufacturing sector in Nigeria despite its critical role in the economy.
2. **Jurisdictional Differences—**existing research predominantly focuses on Indonesia, Malaysia, and other developed economies, with minimal emphasis on Nigeria's unique regulatory and economic environment.
3. **Temporal Limitations** – Nigerian studies cover shorter periods, overlooking the impact of long-term economic and regulatory changes.
4. **Mixed Findings** – Inconsistent results regarding the impact of leverage and firm size on tax aggressiveness suggest the need for localised studies that reflect Nigeria's tax policies and corporate practices.

Addressing these gaps by investigating tax aggressiveness within Nigeria's manufacturing sector over an extended period will enhance understanding of how firm characteristics drive tax strategies. This study will

provide contextual insights relevant to policymakers and corporate managers, bridging the gap between global findings and Nigeria's economic realities.

1.3 Objectives of the Study

The primary objective of this study is to investigate the impact of capital structure on tax aggressiveness among listed manufacturing firms in Nigeria. Specifically, the study aims to:

i. Examine the relationship between leverage and tax aggressiveness.
ii. Assess the influence of external audits on tax aggressiveness.
iii. Evaluate the effect of firm revenue growth on tax aggressiveness.
iv. Determine the relationship between firm size and tax aggressiveness.

2.0 Literature Review

2.1 Conceptual Issues

Capital Structure

Capital structure refers to the specific combination of debt and equity a firm uses to finance its operations and assets (Brealey, Myers, & Allen, 2023). It represents a company's financing mix, indicating the sources and proportions of its long-term funding. The financing or leverage decision is a significant managerial decision because it may influence shareholder value, risk, and the firm's market value. The debt-to-equity ratio has implications for dividends, risk, and the cost of capital (Pandey, 2007).

Leverage: Firms with higher leverage levels often engage in tax aggressiveness by utilising interest deductions to reduce taxable income. The deductibility of interest expenses incentivises debt financing, creating opportunities for tax minimisation (Ribeiro, Cerqueira, & Brandão, 2015). Highly leveraged firms are more likely to pursue aggressive tax strategies to manage their financial obligations and enhance shareholder value. Companies with higher leverage benefit from interest deductibility, reducing taxable income (Minnick & Noga, 2010). However, firms with greater leverage may rely less on aggressive tax planning due to the inherent tax benefits of debt (Badertscher et al., 2013).

External Audit: External audits serve as a monitoring mechanism, potentially curbing tax aggressiveness. Auditors are critical in ensuring compliance with tax regulations and financial reporting standards. Firms subject to rigorous external audits are less likely to engage in aggressive tax practices due to the heightened risk of detection and penalties (Minnick & Noga, 2010).

Firm Revenue Growth: Firms experiencing significant revenue growth may exhibit varying levels of tax aggressiveness. Rapidly growing firms might exploit tax incentives and allowances to sustain growth, while others may resort to aggressive tax avoidance to manage expanding tax liabilities. Revenue growth influences managerial decisions regarding tax planning and tax-saving strategies.

Firm Size: Larger firms typically possess more excellent resources and access to sophisticated tax planning strategies, allowing them to engage in more aggressive tax practices. At the same time, their visibility and regulatory scrutiny may deter extreme forms of tax avoidance. The relationship between firm size and tax aggressiveness reflects a balance between resource availability and regulatory oversight (Richardson et al., 2013).

Tax Aggressiveness: Tax aggressiveness involves actions taken by firms to minimise taxable income through tax planning practices. It ranges from legitimate tax planning to more extreme forms of tax avoidance that push

legal boundaries (Braithwaite, 2005). Corporate tax aggressiveness is often characterised by intentional schemes to reduce tax obligations. While this may enhance firm value, it poses penalties and reputational damage risks. Tax aggressiveness is typically measured through proxies like effective tax rates, with lower rates indicating higher tax aggressiveness (Hanlon & Slemrod, 2009). This study defines tax aggressiveness as extreme tax planning strategies employed by manufacturing firms in Nigeria to lower tax liabilities. Nexus between capital structure and tax aggressiveness: Capital structure, reflected through proxies such as leverage, external audit, firm revenue growth, and firm size, significantly shapes tax aggressiveness. By examining these factors, the study aims to comprehensively understand the dynamics between capital structure and tax aggressiveness, offering valuable insights for policymakers and stakeholders in Nigeria's manufacturing sector.

Empirical Review

Rani et al. (2018) investigated the influence of corporate characteristics on tax avoidance through the lens of agency theory. Using data from 49 listed manufacturing firms on the Indonesia Stock Exchange (2012–2016), panel regression revealed that firm size and profitability negatively affected tax avoidance, while leverage had a positive impact. The study, however, was conducted in a jurisdiction distinct from Nigeria. Ryandono et al. (2020) explored factors influencing tax avoidance in Indonesia, relying on tax avoidance and agency theory. Analysing data from 19 food and beverage firms (2014–2016), the study found that firm size significantly affected tax avoidance, while profitability, leverage, and capital intensity had no effect. The study covered a limited three-year period. Devi et al. (2018) examined firm characteristics and tax aggressiveness in Malaysia, revealing that firm size, profitability, debt intensity, capital intensity, and growth significantly impacted tax aggressiveness, while Salman et al. (2018) studied determinants of tax aggressiveness in Sharia-listed entities on the Indonesia Sharia Share Index (2011–2014). Results showed that firm size and profitability significantly influenced tax aggressiveness, though leverage and capital intensity had no impact. Jong et al. (2017) assessed the relationship between firm age, growth, and tax aggressiveness in Korean SMEs. Based on 4,076 firm-year observations (1999–2011), findings indicated older firms were less tax-aggressive due to reputational concerns, whereas firm growth positively correlated with tax aggressiveness. Similarly, Yuniarwati et al. (2017) found that profitability significantly influenced tax avoidance, while firm size did not, using data from Indonesian manufacturing firms (2013–2015). Putra et al. (2018) examined tax avoidance determinants in Indonesia, analysing 100 listed firms. Results highlighted that profitability, leverage, and capital intensity significantly influenced tax avoidance. However, the study's jurisdiction differs from Nigeria's. Ogbeide (2017) focused on Nigerian non-financial firms (2012–2016), finding that firm size positively influenced tax aggressiveness, while leverage had a negative impact. Also, Mgbame et al. (2017) analysed Nigerian firms (2007–2012) and found that firm size and performance significantly influenced tax aggressiveness. Economic and regulatory shifts marked the period covered. Similarly, Pratama and Padjadjaran (2017) studied 27 Indonesian firms (2011–2015) under the political cost theory. Results revealed that firm size and age negatively influenced tax avoidance, while profitability had a positive effect. Leverage was insignificant. Ribeiro et al. (2015) analysed 704 non-financial firms on the London Stock Exchange (2010– 2013), finding that firm size and profitability positively influenced effective tax rates, while leverage and capital intensity had adverse effects. Jensen and Meckling (1976) posited that managers reduce tax liabilities to maximise shareholder wealth, aligning with agency theory. Tax aggressiveness lowers operating

costs but must remain within legal bounds. Crocker and Slemrod (2005) emphasised that while tax aggressiveness enhances after-tax returns, it incurs potential fines, implementation costs, and reputational risks. Seidman and Stomberg (2011) supported agency theory as a framework for understanding tax aggressiveness, with Lee, Dobiyanski, and Minton (2015) reinforcing its relevance in explaining tax liability reduction strategies.

Theoretical Framework

The theories underpinning the study are Agency Theory and trade-off theory. The Agency theory was propounded by Michael C. Jensen and William H. Meckling (1976) Agency theory explains the relationship between principals (shareholders) and agents (managers). Managers, as agents, are expected to act in the best interest of shareholders. However, conflicts of interest often arise, leading managers to pursue strategies, such as tax aggressiveness that enhance firm value but may increase risks, such as regulatory penalties and reputational damage. The trade-off theory founded by Kraus and Litzenberger (1973 posits that firms balance the benefits of debt (such as tax shields) against the costs (such as bankruptcy risk). Firms may engage in tax planning by altering their capital structure to maximise tax savings, aligning with the idea that higher leverage can lead to increased tax aggressiveness.

Relevance to the theories of the study

Agency Theory Relevance:

- **Tax Aggressiveness Motivation:** Managers may adopt aggressive tax strategies to reduce tax liabilities and improve after-tax earnings, enhancing shareholder value. However, excessive tax aggressiveness may expose firms to regulatory scrutiny and reputational damage. This theory explains why capital structure (debt and equity mix) influences managerial decisions regarding tax planning.
- **Debt as a Monitoring Mechanism:** High leverage imposes discipline on managers, reducing free cash flow and limiting opportunistic behaviour. This aligns with the premise that debt can curb tax aggressiveness by imposing constraints on managerial discretion.

Trade-Off Theory Relevance:

- **Leverage and Tax Planning:** The trade-off theory explains how firms utilise debt to optimise tax benefits. Since interest expenses are tax-deductible, firms with higher leverage reduce their taxable income, engaging in less aggressive tax strategies. Alternatively, firms with low debt may resort to aggressive tax avoidance to achieve similar benefits.
- **Capital Structure Decisions:** This theory underscores the role of capital structure in shaping firms' tax strategies, providing a framework to analyse the link between leverage and tax aggressiveness in manufacturing firms.

Application to the Study (Listed Manufacturing Firms in Nigeria):

- **Capital Structure as a Strategic Tool:** Manufacturing firms in Nigeria may leverage debt to minimise tax liabilities, driven by the need to balance growth with cost minimisation.
- **Managerial Behaviour in Emerging Markets:** Agency conflicts are heightened in emerging markets like Nigeria due to weaker regulatory environments, increasing the likelihood of tax aggressiveness to boost firm performance.

- **Policy Implications:** Understanding how capital structure impacts tax aggressiveness can help policymakers craft regulations to ensure tax compliance while allowing firms to benefit from legitimate tax planning strategies.

These theoretical foundations provide a robust framework for analysing the impact of capital structure on tax aggressiveness, offering insights into managerial behaviour, firm performance, and regulatory outcomes in Nigeria's manufacturing sector.

Methodology

This study aims to assess the impact of capital structure on tax aggressiveness. A correlational research design was employed to achieve this. The target population was 39 manufacturing companies listed on the Nigeria Exchange Group (NGX), with data obtained from their annual reports covering the period from 2013 to 2022. The dependent variable, corporate tax aggressiveness, represents the effective tax rate (TRATE). TRATE is calculated as the current income tax expense divided by pre-tax income, following the approach of Lanis and Richardson (2012). This measure reflects a firm's capacity to reduce its tax liability relative to pre-tax accounting profits, providing insight into the comparative tax burden across firms (Rego, 2003). A lower TRATE suggests more aggressive tax planning, while higher TRATE values indicate less aggressive tax behaviour.

The study's explanatory variables consist of four firm-specific attributes:

1. **Firm Leverage**
2. **External Audit**
3. **Firm Revenue Growth**
4. **Firm Size**
5. These variables were selected to explore their influence on the tax strategies employed by listed manufacturing firms in Nigeria.

Model Specification

Based on these variables, the empirical results are therefore based on the following regression model;

$$\mathbf{TRATE_{it}=f\ (ETR)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(i)}$$

$$\mathbf{TRATE_{it} = \alpha_0 + \beta_1 LEV_{it} + \beta_2 EXTA_{it} + \beta_3 REVG_{it} + \beta_4 FSIZE_{it} + \epsilon_{it}} \text{ -------------------- } \mathbf{(ii)}$$

TRATE = Income Effective Tax Rate

LEV = Leverage

EXTA = External Audit

REVG = Revenue Growth

Fsize = Firm Size (proxied by the log of Total Assets) $\boldsymbol{\alpha_0}$ = Constant or intercept $\boldsymbol{\beta_1 - \beta_4}$ = Regression coefficients.

ε = Stochastic error term.

4. Results and Discussion

This section presented and discussed the data collected for the study, including the descriptive statistics, correlation matrix, and inferential statistics.

Table 1: Descriptive Analysis Result

	TRATE	LEV	EXTA	REVG	FSIZE

Mean	59.93351	63.64096	0.587766	19.27503	16.59574
Median	30.00000	58.00000	1.000000	6.670000	16.00000
Maximum	4108.000	337.0000	1.000000	1156.640	22.00000
Minimum	0.000000	11.00000	0.000000	-1778.850	12.00000
Std. Dev.	261.8104	38.08014	0.492893	151.3587	2.190010
Skewness	12.13742	3.959796	-0.356601	-1.051813	0.163734
Kurtosis	170.7763	23.79506	1.127164	76.74344	2.247064
Jarque-Bera	450230.9	7757.422	62.92001	85266.14	10.56165
Probability	0.000000	0.000000	0.000000	0.000000	0.005088
Sum	22535.00	23929.00	221.0000	7247.410	6240.000
Sum Sq. Dev.	25704249	543786.5	91.10372	8591044.	1798.553
Observations	376	376	376	376	376

Source: E-View 12 Output (2024)

Table 1: Descriptive Analysis Result

1. Tax Aggressiveness (TRATE):

- **Mean (59.93):** On average, the effective tax rate for the firms is approximately 59.93%, suggesting moderate tax aggressiveness.
- **Median (30.00):** Half of the firms have an effective tax rate below 30%, indicating that many firms engage in aggressive tax planning.
- **Maximum (4108.00) and Minimum (0.00):** The wide range reflects significant variation in tax aggressiveness. Some firms pay no tax (0%), while others report incredibly high rates (4108%), likely due to penalties or misreporting.
- **Standard Deviation (261.81):** A high deviation indicates substantial variability in tax aggressiveness across firms.
- **Skewness (12.14) and Kurtosis (170.78):** The extreme skewness and kurtosis suggest a highly non-normal distribution, with extreme outliers inflating the TRATE values.
- **Jarque-Bera (450230.9, p = 0.000):** The significant p-value confirms that TRATE is not normally distributed.

2. Leverage (LEV):

- **Mean (63.64):** Firms, on average, maintain a leverage ratio of 63.64%, indicating a reliance on debt financing.
- **Median (58.00):** The distribution is symmetric, with most firms clustering around the 58% leverage level.
- **Maximum (337.00) and Minimum (11.00):** Some firms are highly leveraged, while others operate with minimal debt.

- **Skewness (3.96) and Kurtosis (23.80):** The leverage distribution is positively skewed, reflecting that a few firms carry disproportionately high debt levels.
- **Jarque-Bera (7757.42, p = 0.000):** The significant p-value indicates a non-normal distribution.

3. External Audit (EXTA):

- **Mean (0.59):** Approximately 59% of the firms are externally audited, suggesting that external audits are ordinary but not universal.
- **Median (1.00):** The median of 1 suggests that external audits are more frequent than not.
- **Maximum (1.00) and Minimum (0.00):** This is a binary variable (1 = audited, 0 = not audited).
- **Skewness (-0.36) and Kurtosis (1.13):** The distribution is slightly skewed to the left but remains relatively standard.
- **Jarque-Bera (62.92, p = 0.000):** Despite minor skewness, the distribution significantly deviates from normality.

4. Revenue Growth (REVG):

- **Mean (19.27):** Firms, on average, report revenue growth of 19.27%, indicating a positive but modest growth trajectory.
- **Median (6.67):** Half of the firms report growth below 6.67%, reflecting slow growth in some firms.
- **Maximum (1156.64) and Minimum (-1778.85):** The extreme values (both positive and negative) highlight firms with rapid expansion or significant revenue losses.
- **Standard Deviation (151.36):** The high deviation signifies volatility in firm growth.
- **Skewness (-1.05) and Kurtosis (76.74):** Negative skewness reflects a concentration of firms with lower growth rates, while a high kurtosis signals a few extreme outliers.
- **Jarque-Bera (85266.14, p = 0.000):** The distribution deviates significantly from normality.

5. Firm Size (FSIZE):

- **Mean (16.60):** The average firm size is around 16.6, suggesting moderate-sized firms.
- **Median (16.00):** The distribution is relatively centred, with most firms on this size.
- **Maximum (22.00) and Minimum (12.00):** Firm size varies within a narrower range than other variables.
- **Standard Deviation (2.19):** The deviation is low, indicating minimal variability in firm size.
- **Skewness (0.16) and Kurtosis (2.25):** The data has a near-normal distribution, with slight positive skewness.
- **Jarque-Bera (10.56, p = 0.005):** The p-value indicates slight non-normality but not as severe as other variables.

Summary of the Descriptive Statistics

The descriptive statistics reveal significant variability in tax aggressiveness, leverage, and revenue growth among listed manufacturing firms in Nigeria. The presence of extreme values in TRATE and REVG suggests that some firms experience aggressive tax planning or substantial fluctuations in performance. Leverage and external audits play crucial roles in firm behaviour, aligning with the study's objective of assessing the relationship between capital structure and tax aggressiveness.

Table 2: Correlation Analysis Result

Covariance Analysis: Ordinary
Date: 12/3/24 Time: 13:28
Sample: 2013 2018
Included observations: 376
Balanced sample (listwise missing value deletion)

Correlation Probability	TRATE	LEV	EXTA	REVG	FSIZE
TRATE	1.000000 -----				
LEV	-0.026196 0.6126	1.000000 -----			
EXTA	0.015968 0.7576	-0.176124 0.0006	1.000000 -----		
REVG	0.002065 0.9682	-0.265922 0.0000	0.111460 0.0307	1.000000 -----	
FSIZE	-0.044896 0.3853	-0.157404 0.0022	0.465279 0.0000	0.137266 0.0077	1.000000 -----

Source: E-View 12 Output (2024)

Table 2: Correlation Analysis Result

The table presents the correlation matrix for the study variables, showing the strength and direction of relationships between tax aggressiveness (TRATE), leverage (LEV), external audit (EXTA), revenue growth (REVG), and firm size (FSIZE). The probability values (p-values) indicate the significance of each correlation.

Key Observations:

1. **TRATE (Tax Aggressiveness) vs. Other Variables**

- **LEV (Leverage):** The Correlation of -0.0262 has a **w**eak negative relationship, and a p-value of **0.6126 is n**ot statistically significant. This indicates that leverage has a minimal and insignificant impact on tax aggressiveness. This suggests that the level of debt financing does not strongly influence tax planning behaviour in these firms.
- **EXTA (External Audit):** The correlation of **0.01597** has a weak positive relationship, and a p-value of **0.7576 is n**ot statistically significant. This result indicates that external audits have a negligible and insignificant effect on tax aggressiveness. This shows that audited firms do not differ significantly from unaudited ones regarding tax planning practices.
- REVG (Revenue Growth): The correlation of 0.00207 has a near-zero positive relationship, and the p-value of 0.9682 is not statistically significant. The result shows that revenue growth exhibits no meaningful correlation with tax aggressiveness, suggesting that firms' growth rates do not directly influence their tax-saving strategies.
- FSIZE (Firm Size): The correlation of -0.0449 has a weak negative relationship, and a p-value of 0.3853 is not statistically significant. The result shows that firm size has a weak and insignificant negative relationship with tax aggressiveness, implying that larger firms may engage slightly less in aggressive tax planning, but the relationship lacks statistical support.

2. **Relationships among Independent Variables:**

- **LEV vs. EXTA:** The Correlation of **-0.1761 shows a m**oderate negative relationship, and a p-value of **0.0006** is statistically significant. The result indicates that firms with higher leverage are less likely to undergo external audits, possibly due to cost constraints or perceived risks.
- **LEV vs. REVG:** The correlation of **-0.2659 has a m**oderate negative relationship, and a p-value of **0.0000** is highly significant. The result indicates that firms with higher debt levels experience lower revenue growth, which may reflect the debt servicing burden.
- **LEV vs. FSIZE:** The correlation of **-0.1574 has a w**eak negative relationship, and a pvalue of **0.0022** is statistically significant. It reveals that larger firms tend to have lower leverage, indicating that more prominent firms may rely less on debt financing.
- **EXTA vs. FSIZE:** The Correlation of **0.4653** has a moderate positive relationship, and a p-value of **0.0000** is highly significant. This shows that larger firms are more likely to be externally audited, reflecting the increased scrutiny accompanying firm size.
- **EXTA vs. REVG:** The correlation of **0.1115 has a w**eak positive relationship, and a p-value of **0.0307** is statistically significant. The result indicates that firms experiencing higher revenue growth are marginally more likely to be audited, suggesting a link between growth and external oversight.
- **REVG vs. FSIZE:** The correlation of **0.1373 has a w**eak positive relationship, and a p-value of **0.0077 is s**tatistically significant. This indicates that larger firms have slightly higher revenue growth, indicating that firm size may facilitate expansion opportunities.

Summary of the Correlation Analysis

The correlation analysis reveals weak and insignificant relationships between tax aggressiveness (TRATE) and firm-specific characteristics. This suggests that factors like leverage, external audit, revenue growth, and firm size do not independently drive aggressive tax strategies among listed manufacturing firms in Nigeria. However, the significant interactions between leverage, external audits, and firm size highlight structural differences that may influence overall firm behaviour. The absence of strong correlations points to the need for a more nuanced analysis, potentially involving interaction terms or moderating variables, to uncover more profound insights into the determinants of tax aggressiveness.

Table 3: Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi -Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	32.995193	4	0.0000

Source: E-View 12 Output (2024)

The Hausman test result in Table 3 above indicates that the probability value (0.0000) is lower than the critical value of 0.05. This provides sufficient evidence to reject the null hypothesis at the 5% significance level. Therefore, the study concludes that the Fixed Effects model is the most appropriate for the analysis.

Table 4: Fixed Effects Result

Dependent Variable: TRATE
Method: Panel Least Squares
Date: 01/03/25 Time: 13:29
Sample: 2013 2022
Periods included: 10
Cross-sections included: 38
Total panel (unbalanced) observations: 376

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.98E+08	53422021	13.06121	0.0000
EXTA	4664925.	9504068.	0.490835	0.6239
FSIZE	-51957659	3582806.	-14.50194	0.0000
LEV	-32240.16	956.7973	33.69591	0.0000
REVG	-26715.14	18058.37	-1.479378	0.1400

Effects Specification
Cross-section fixed (dummy variables)

Root MSE	45711762	R-squared	0.923936
Mean dependent var	66560676	Adjusted R-squared	0.914598
S.D. dependent var	1.66E+08	S.E. of regression	48500772
Akaike info criterion	38.33701	Sum squared resid	7.86E+17
Schwarz criterion	38.77596	Hannan-Quinn criter.	-7165.359
	38.51126	F-statistic	98.95153
Durbin-Watson stat	1.640048	Prob(F-statistic)	0.000000

Source: E- View 12 Output (2024)

Table 4: Fixed Effects Result

The table presents the results of a panel least squares regression with fixed effects, examining the impact of various independent variables (EXTA, FSIZE, LEV, and REVG) on the dependent variable (TRATE). The constant term is significant at a p-value of 0.0000 with a large positive coefficient (6.98E+08), indicating a strong baseline effect on TRATE. The EXTA (External Auditor) has a positive coefficient (4664925) but is statistically insignificant (p-value = 0.6239), suggesting no significant relationship with TRATE. The FSIZE (Firm Size) has a negative and significant effect on TRATE with a coefficient of -51957659 and a p-value of 0.0000. As firm size increases, TRATE decreases significantly. The LEV (Leverage), which has a coefficient of -32240.16 and a p-value of 0.0000, shows a negative and significant relationship with TRATE. In contrast, REVG (Revenue

Growth), with a coefficient of 26715.14 and a p-value of 0.1400, has a negative but insignificant relationship with TRATE. The results suggest that revenue growth does not significantly affect TRATE.

Model Fit and Diagnostics

- R-squared (0.923936): The model explains approximately 92.4% of the variation in TRATE, indicating excellent explanatory power. Adjusted R-squared (0.914598): After adjusting for the number of predictors, the model still explains about 91.5% of the variability. F-statistic (98.95153, p-value = 0.000000): The overall model is highly significant, meaning the independent variables collectively explain the variation in TRATE. Durbin-Watson Statistic of (1.640048) suggests no significant autocorrelation exists in the residuals.

Conclusion:

- The fixed-effects model fits the data well, with firm size (FSIZE) and leverage (LEV) significantly impacting
- TRATE while EXTA, REVG) do not significantly influence the dependent variable.
- The model's high R-squared indicates strong predictive power, but some variables (The study confirms that the **fixed effects approach** effectively captures the relationship between firm characteristics and TRATE over time.

The result from the table above shows that REVG, and FSIZE have a negative relationship with the explained variable (TRATE). Meanwhile, EXTA and LEV have a positive on the dependent variable (TRATE).

Table 5: Heteroskedasticity Test

Panel Cross-section Heteroskedasticity LR Test
Equation: UNTITLED
Specification: TRATE C LEV EXTA REVG FSIZE
Null hypothesis: Residuals are homoscedastic

	Value	df	Probability
Likelihood ratio	1188.422	38	0.0000

LR test summary:

	Value	df
Restricted LogL	-7220.081	371
Unrestricted LogL	-6625.870	371

Source: E-View 12 Output (2024)

This table 5 presents the results of the **Likelihood Ratio (LR) test** for panel cross-section heteroskedasticity. The test evaluates whether the residuals in the model exhibit heteroskedasticity (variance of errors differs across observations) or are homoscedastic (constant variance).

- **Null Hypothesis (H_0):** Residuals are homoscedastic (no heteroskedasticity).
- **Alternative Hypothesis (H_1):** Residuals are heteroskedastic (variance is not constant). The p-value of 0.0000 is below 0.05, leading to the rejection of the null hypothesis at the 5% significance level. The test results indicate the presence of **heteroskedasticity** in the model, as the null hypothesis of homoscedasticity is rejected. This implies that the error terms do not have constant variance, which may affect the efficiency of the estimated

coefficients. Robust standard errors or generalised least squares (GLS) methods should be considered to correct for heteroskedasticity and improve the reliability of the model's estimates. However, the Hausman test in Table 3 above concludes that the Fixed Effects model is the most appropriate for the analysis. Therefore, the result is interpreted using a fixed effect model.

Discussion of Findings

The Fixed Effects result revealed that a negative and statistically significant influence exists between LEV and TRATE. This was a reflection of a negative LEV coefficient value of 32240.16 and an associated p-value of 0.0000. This means that leverage had an insignificant effect on tax aggressiveness over the specified timeframe. Similarly, FSIZE depicted a negative (-51957698) and significant (0.0000) impact on TRATE during the period under review. Furthermore, the coefficient of REVG was found to be negative but statistically insignificant. This is as revealed by a coefficient value of -26715.14 and a p-value of 0.1400. Meanwhile, EXTA had a positive (4664925) and insignificant (p.v 0.6239) impact on TRATE. This is an indication that external audit had an insignificant impact on tax aggressiveness over the study period. The R-squared which shows the goodness of fit has a coefficient value of 0.923936 and this indicates that the model is fit for policy making. The F-statistic which shows the overall significance of the regression model was found to be statistically significant (0.000000) at 5%. This shows that the overall regression model is significant for the data.

5. Conclusions

Company tax decisions are ever more on the main agenda of managers when making their strategic selections. Tax aggressiveness is implemented by using the firms to reduce or lessen the amount of taxes they're supposed to pay. This study investigated how tax aggressiveness is affected by firms' capital structure in Nigeria. To examine this, the study used a sample of thirty-nine (39) manufacturing companies listed on the Nigerian Stock Exchange using data extracted from their annual report from 2013 to 2022. Overall, it is shown from the study that firm-specific attributes do not significantly influence the level of tax aggressiveness. Findings from the study showed that both firm leverage and external audit insignificantly affect the level of tax aggressiveness. An increase in leverage leads to a reduction in the effective tax rate due to the high tax deductibility of interest which implies a higher level of tax aggressiveness undertaken by the company. More so, the findings show that external audit insignificantly and positively influence the level of corporate tax aggressiveness. Explanatory variables such as firm size and revenue growth have no significant influence on the level of corporate tax aggressiveness. Our paper adds some insights to the growing literature on corporate tax aggressiveness and gives more understanding of its determinants. Our findings will be useful to regulators, policymakers, and tax researchers, in studying the level of tax aggressiveness and analysis of which factors may influence the taxes paid by firms.Despite the importance of our findings, our research has some limitations. A short period of 10 years was used; further research may extend years of research beyond 10 years. It would be interesting if future studies examine factors that influence long-run effective tax rates. Future studies can also have a look at other corporate's traits, which include liquidity, to further enhance the discussion of tax aggressiveness.

Recommendations

(I) Enhanced Monitoring of Leverage-Based Tax Strategies

- **Responsible Agencies:**

- Federal Inland Revenue Service (FIRS)
- Securities and Exchange Commission (SEC) Nigeria

• **Implementation Steps:**

- The **FIRS** should establish a dedicated unit to scrutinize debt-financed tax planning strategies, particularly interest deductions claimed by manufacturing firms. O
- The **SEC** can require listed companies to disclose detailed information on leverage usage and associated tax benefits in their annual reports.

• **Stakeholders:**

- Nigerian Stock Exchange (NSE): To facilitate compliance through corporate reporting requirements. O Manufacturing companies: To align their financing structures with regulatory expectations.

(II) Strengthening External Audit Frameworks

• **Responsible Agencies:**

- Financial Reporting Council of Nigeria (FRCN)
- Institute of Chartered Accountants of Nigeria (ICAN)

• **Implementation Steps:**

- The **FRCN** should revise auditing standards to include specific requirements for external auditors to evaluate tax planning practices.
- The **ICAN** should train and certify auditors on detecting aggressive tax behaviours and understanding the regulatory landscape in Nigeria.

• **Stakeholders:**

- Audit Firms: To implement stricter evaluations and reporting on tax-related issues. O Corporate Boards: To establish audit committees tasked with overseeing tax planning practices.

(III) **Promotion of Tax Compliance Incentives**

• **Responsible Agencies:**

- Ministry of Finance
- Federal Inland Revenue Service (FIRS)

• **Implementation Steps:**

- The **Ministry of Finance** can introduce a "Corporate Tax Compliance Incentive Scheme" that rewards companies demonstrating ethical tax practices. Incentives could include tax rate reductions, public recognition, or access to streamlined tax filing systems. O
- The **FIRS** can create a transparent scoring system for tax compliance, highlighting companies that consistently maintain high standards of tax responsibility. This score could be published annually to encourage companies to prioritize compliance.

• **Stakeholders:**

- Manufacturing Companies: Encouraged to adopt less aggressive tax strategies in exchange for incentives and reputational benefits. O Tax Consultants: Tasked with helping companies align their tax strategies with compliance requirements. O Investors and Shareholders: Provided with greater transparency on the tax practices of firms they invest in, improving their confidence in corporate governance.

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