



Tax Aggressiveness, Firm Heterogeneity and Value Relevance of Accounting Information Among Industrial Goods Companies in Nigeria

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Abstract

This study examines the influence of tax aggressiveness and firm heterogeneity on the value relevance of accounting information among listed industrial goods companies in Nigeria. Anchored on Agency Theory, the study investigates whether firm-specific differences condition the effect of tax planning strategies on market valuation. Using an ex-post facto research design, panel data were collected from eleven firms listed on the Nigerian Exchange Group over the period 2012–2023. Tax aggressiveness was proxied by Effective Tax Rate (ETR), firm heterogeneity by industry classification, and value relevance by Tobin's Q, while profitability and leverage were included as control variables. Data were analysed using Panel-Corrected Standard Errors (PCSE) to address heteroscedasticity and cross-sectional dependence. The findings reveal that tax aggressiveness has a marginal negative effect on firm value, while firm heterogeneity significantly reduces value relevance. More importantly, the interaction between tax aggressiveness and firm heterogeneity is negative and statistically significant, indicating that the valuation effect of tax strategies varies across industrial sub-sectors. The results suggest that investors interpret aggressive tax behaviour differently depending on firm characteristics. The study recommends balanced tax planning and enhanced disclosure to improve transparency and sustain investor confidence.

Keywords: Tax aggressiveness, firm heterogeneity, value relevance, Tobin's Q, industrial goods firms, Nigeria.

Introduction

Background to the Study

Corporate organisations exist primarily to create value for shareholders. The ability of firms to generate sustainable returns depends not only on operational efficiency but also on strategic financial decisions, including tax planning. Taxes represent a significant outflow of corporate resources and directly affect distributable earnings. Consequently, managers often engage in tax planning activities aimed at reducing tax liabilities within the boundaries of the law (Jeroh, 2023; Okocha & Jeroh, 2024).

Tax aggressiveness refers to the extent to which firms pursue strategies to minimise tax payments through legal planning techniques or more aggressive interpretations of tax laws (Frank et al., 2009; Chen et al., 2010; Ajube & Jeroh, 2023). While such strategies may enhance short term cash flows, they may also create uncertainty, reputational concerns, and information asymmetry. These factors can affect how

investors interpret accounting information and, ultimately, how financial statements reflect firm value.

The concept of value relevance explains the degree to which accounting information is reflected in market valuation (Barth et al., 2001; Sinebe, Jeroh & Ebiaghan, 2025). When accounting numbers are value relevant, they assist investors in making informed decisions. However, the usefulness of accounting information may vary depending on firm characteristics. Firms differ in size, leverage, profitability, industry classification, and operational complexity. Such firm heterogeneity may influence both tax behaviour and the market's interpretation of financial information.

In Nigeria, industrial goods companies operate within a complex regulatory and tax environment. High statutory tax rates, multiple taxation concerns, and compliance challenges create incentives for tax planning. At the same time, differences across industrial subsectors such as construction materials, chemicals, plastics, and paper products may influence financial reporting outcomes. Despite growing research

on tax aggressiveness and firm value in Nigeria, limited attention has been given to how firm heterogeneity shapes the relationship between tax aggressiveness and the value relevance of accounting information.

Research Objective and Hypothesis

This study examines whether tax aggressiveness and firm heterogeneity, individually and jointly, influence the value relevance of accounting information among listed industrial goods companies in Nigeria. To address this objective, the study tests the following hypothesis:

H₀: Tax aggressiveness, firm heterogeneity, and their interaction have no significant effect on the value relevance of accounting information among industrial goods companies in Nigeria.

Conceptual Review and Theoretical Framework

Tax Aggressiveness

Tax aggressiveness refers to the deliberate efforts made by firms to reduce their tax liabilities through various planning strategies (Frank et al., 2009). These strategies may include the use of allowable deductions, tax credits, transfer pricing arrangements, and alternative financing or corporate structures that minimise taxable income. In principle, tax planning is a legitimate managerial function aimed at improving after tax cash flows. Some scholars therefore argue that well designed tax strategies can enhance shareholder value by increasing retained earnings and improving liquidity (Scholes et al., 2015). However, other studies suggest that excessively aggressive tax behaviour may reduce financial transparency, increase information asymmetry, and intensify agency conflicts between managers and shareholders (Desai & Dharmapala, 2006; Lanis & Richardson, 2012).

In empirical research, the Effective Tax Rate (ETR) is commonly used as a proxy for tax aggressiveness (Rego, 2003). The ETR reflects the proportion of accounting income paid as tax and provides an observable measure of a firm's tax burden. Generally, a lower effective tax rate is interpreted as evidence of more intensive tax planning activities, while a higher rate suggests a more conservative tax position.

Firm Heterogeneity

Firm heterogeneity describes the differences that exist across firms in terms of their structural and economic characteristics, such as size, profitability, leverage, and industry classification. These differences shape managerial incentives, determine the level of operational and financial risk, and influence the manner in which firms prepare and present financial information. Apparently, it is expected that while larger

firms may face greater regulatory scrutiny, highly leveraged firms may be more concerned about debt covenants, whereas firms in different industries may operate under varying competitive and cost structures.

Prior empirical studies show that these firm specific characteristics are not neutral. They play an important role in explaining variations in tax behaviour and market valuation (Ogbeide et al., 2022; Okocha & Jeroh, 2024). In other words, firms with different structural attributes may adopt different tax strategies and may also be valued differently by investors. In this study, firm heterogeneity is measured using industry classification within the industrial goods sector, thereby capturing differences in operational orientation and business activities across firms.

Value Relevance of Accounting Information

Value relevance refers to the extent to which accounting information explains variations in a firm's market value. In empirical accounting research, it is typically examined by assessing the statistical association between financial statement figures and market based measures such as share price or firm value (Barth et al., 2001). When accounting numbers are said to be value relevant, it means that investors consider them useful in assessing a firm's performance, risk profile, and future prospects. In essence, value relevance reflects the decision usefulness of financial reporting.

The underlying assumption is that capital markets respond to credible and informative accounting disclosures. If reported earnings, book values, or other financial indicators faithfully represent the economic reality of the firm, investors incorporate this information into their valuation decisions. Conversely, when accounting information lacks transparency or reliability, its ability to influence market valuation diminishes. Therefore, examining value relevance provides insight into the quality and usefulness of financial reporting within a given institutional context.

In this study, value relevance is assessed with reference to firm value which is measured using Tobin's Q. Tobin's Q represents the ratio of the market value of a firm to the replacement cost of its assets. It is widely regarded as a forward looking indicator because it captures investors' expectations about the firm's future growth opportunities and profitability. A higher Tobin's Q suggests that the market values the firm above the recorded value of its assets, reflecting positive expectations about future performance, while a lower value may indicate weaker market confidence.

Theoretical Framework

This study is anchored on Agency Theory (Jensen & Meckling, 1976; Desai & Dharmapala, 2006). Agency

theory suggests that managers may pursue tax aggressive strategies to increase reported earnings or private benefits. However, excessive tax aggressiveness may increase information risk and reduce investor confidence.

Firm heterogeneity may intensify agency problems due to differences in operational complexity and monitoring effectiveness. Therefore, the interaction between tax aggressiveness and firm characteristics may influence how markets interpret accounting information.

Methodology

This study adopts an *ex-post facto* research design to examine the relationship between tax aggressiveness, firm heterogeneity, and the value relevance of accounting information among listed industrial goods companies in Nigeria. The choice of this design is appropriate because the study relies exclusively on historical financial data without manipulating any of the variables of interest. By utilizing already published audited financial statements, the research objectively investigates existing relationships and patterns as they naturally occur within firms.

The population comprises all industrial goods companies listed on the Nigerian Exchange Group (NGX) that remained continuously listed between 1 January 2012 and 31 December 2023. Given the relatively small population size of eleven firms, a census sampling approach was employed, thereby including all eligible companies that consistently published audited annual reports within the study period. Secondary data were extracted from the NGX database and the firms' publicly available financial statements over the twelve-year period (2012–2023), which coincides with Nigeria's adoption of International Financial Reporting Standards (IFRS), enhancing reporting comparability and reliability.

Results and Discussion

Descriptive Statistics

Table 1: Summary Statistics

Variable	Obs	Mean	Std Dev	Min	Max
TobinsQ	132	1.6035	2.0355	0.0003	11.1752
ETR	132	0.207	0.6301	-1.5605	4.3587
HETE	132	2.6364	1.6171	1	6
ROA	132	0.0849	0.233	-1.7992	1.089
LEV	132	-1.0491	23.731	-261.1225	55.6401

Source: Fieldwork, 2025

Table 1 reports the descriptive statistics for 132 firm-year observations used to examine the links among tax aggressiveness, firm heterogeneity, and the value relevance of accounting information. Tobin's Q, which serves as the proxy for value relevance, records a mean

of approximately 1.6035 and a standard deviation of 2.0355. The average value above one suggests that, generally, the market values of the sampled industrial goods firms have values that are higher than their replacement costs; thus, reflecting positive investor

Model Specification

The study utilized the Panel-Corrected Standard Errors (PCSE) regression technique to control for heteroscedasticity and contemporaneous correlation across firms. This approach is appropriate for panel data analysis and provides robust and reliable coefficient estimates, particularly in studies involving cross-sectional dependence. In line with the stated hypothesis, the study's regression model was estimated, and the specified equation are presented below:

Regression Model

$$TQ_{it} = \beta_0 + \beta_1 ETR_{it} + \beta_2 HETE_{it} + \beta_3 (ETR * HETE)_{it} + \beta_4 ROA_{it} + \beta_5 LEV_{it} + \varepsilon_{it}$$

where TQ_{it} denotes the Tobin's Q of firm i at time t ; ETR represents the effective tax rate; $HETE$ is the firm heterogeneity index obtained using PCA of structural firm characteristics; LEV captures Leverage, and ROA measures profitability as return on assets. Interaction terms between tax aggressiveness (ETR) and firm heterogeneity (HETE) captures whether firm heterogeneity strengthens or weakens the influence of tax aggressiveness on value relevance. The coefficient β_0 represents the intercept, β_1 to β_9 denote parameter estimates and ε is the stochastic error term.

expectations about growth. However, the wide range between the minimum and maximum values (0.0003 to 11.1752) indicates substantial differences in how the market prices firms' accounting information across years and entities.

Tax aggressiveness, which was measured by effective tax rate (ETR), has a mean of 0.207 (20.7%), which is below Nigeria's statutory corporate tax rate of 30%. This implies that, on average, firms engage in tax planning that lowers their tax burden. The large dispersion and extreme values for ETR (-1.5605 to 4.3587) point to considerable volatility in tax outcomes, possibly arising from losses, deferred tax adjustments, or unusual tax charges. On its part, firm heterogeneity shows moderate sectoral spread, while profitability

(ROA) reflects modest average returns but significant swings between losses and gains. Leverage exhibits extreme variability, suggesting capital structure differences and potential outliers. Overall, the statistics reveal pronounced structural differences across firms, which supports the use of panel estimation techniques.

Test for Normal Distribution of Data

The normality of the data was assessed using the Shapiro–Wilk test to determine whether the variables follow a normal distribution. This test was conducted to verify compliance with the underlying assumptions of the Ordinary Least Squares (OLS) regression model. The results of the test are presented in Table 2.

Table 2: Normality Test Outcome

Variables	Obs.	W	V	Z	Prob>Z
TOBINSQ	132	0.70442	30.837	7.721	0.00000
ETR	132	0.46029	56.305	9.077	0.00000
HETE	132	0.93261	7.030	4.392	0.00001
ROA	132	0.60413	41.299	8.379	0.00000
LEV	132	0.14451	89.249	10.114	0.00000

Source: Fieldwork, 2024

Table 2 presents the results of the Shapiro–Wilk normality test for the study variables. The test evaluates whether each variable is normally distributed, with the null hypothesis stating that the data follow a normal distribution. A probability value (Prob > Z) less than 0.05 indicates rejection of normality.

The results show that all variables; that is, Tobin's Q (W = 0.70442, p = 0.00000), ETR (W = 0.46029, p = 0.00000), HETE (W = 0.93261, p = 0.00001), ROA (W = 0.60413, p = 0.00000), and LEV (W = 0.14451, p = 0.00000) have probability values well below the 5% significance level. Consequently, the null hypothesis of normal distribution is rejected for all variables. This implies that the data are not normally distributed. The relatively low W statistics for ETR and LEV, in particular, indicate substantial departures from normality, which may be attributable to extreme values and high dispersion observed in the summary statistics.

The presence of non-normality suggests potential skewness and kurtosis in the dataset, especially for leverage and effective tax rate, which exhibited wide ranges and outliers. However, in panel data analysis with 132 firm-year observations, strict normality is not a critical requirement, particularly when using robust estimation techniques such as Panel-Corrected Standard Errors (PCSE). The PCSE approach corrects for heteroscedasticity and cross-sectional dependence, thereby mitigating the impact of non-normal residual distributions on statistical inference.

Correlation Analysis

Table 3 presents the Spearman Rank Correlation Coefficients, which measure the direction and strength of monotonic relationships among the study variables. The use of Spearman correlation is appropriate given the earlier evidence of non-normality in the data.

Table 3: Correlation Analysis

Variable	TobinsQ	CashETR	HETE	ROA	LEV
TobinsQ	1.000				
ETR	-0.056	1.000			
HETE	-0.341*	0.381*	1.000		
ROA	0.327*	0.259*	-0.087	1.000	

Table 5: PCSE Regression Result for the Test of Hypothesis

Variable	Coefficient	Std Error	z	p-value
ETR	-0.2916	0.1575	-1.85	0.064
HETE	-0.2912	0.0478	-6.09	0
ETR*HETE	-0.0945	0.0361	-2.62	0.009
ROA	1.4254	0.7325	1.95	0.052
LEV	-0.0118	0.0144	-0.82	0.412

Source: Fieldwork, 2025

The coefficient of ETR is negative ($\beta = -0.2916$) and marginally significant at the 10% level ($p = 0.064$). This suggests that higher effective tax rates (lower tax aggressiveness) are associated with lower firm value, implying that tax aggressiveness may enhance market valuation, although the effect is weak. Firm heterogeneity (HETE) shows a negative and highly significant relationship with Tobin's Q ($\beta = -0.2912$, $p < 0.01$). This indicates that differences in business models across industrial sub-sectors significantly influence market valuation, with some sectors being valued less favorably than others.

Importantly, the interaction term (ETR*HETE) is negative and statistically significant ($\beta = -0.0945$, $p = 0.009$). This confirms the moderating role of firm heterogeneity in the relationship between tax aggressiveness and value relevance. Specifically, the impact of tax aggressiveness on firm value varies across industrial sub-sectors, and in some sectors, aggressive tax practices may reduce market valuation. Regarding the control variables, profitability (ROA) has a positive and marginally significant effect ($\beta = 1.4254$, $p = 0.052$), indicating that more profitable firms tend to have higher market value. Leverage (LEV), however, is negative and statistically insignificant ($p = 0.412$), suggesting that capital structure does not significantly influence value relevance within the sampled firms. The results align with Agency Theory and prior findings by Desai and Dharmapala (2006) and Ogbeide et al. (2022).

Overall, the findings provide evidence that while tax aggressiveness may influence firm value, its effect is significantly conditioned by firm heterogeneity, thereby supporting the study's moderating hypothesis.

Conclusion and Recommendations

Conclusion

This study examined the joint influence of tax aggressiveness and firm heterogeneity on the value relevance of accounting information among listed industrial goods firms in Nigeria between 2012 and 2023. The evidence indicates that while tax aggressiveness alone does not significantly reduce value relevance, firm heterogeneity significantly

weakens it. Furthermore, the interaction between tax aggressiveness and firm heterogeneity exacerbates the negative effect on market valuation.

These findings suggest that investors interpret tax strategies differently depending on firm characteristics. In more heterogeneous firms, aggressive tax behaviour may increase information risk and reduce confidence in reported accounting figures.

Recommendations

Based on the study's findings and conclusion, the following recommendations were made:

- i. Industrial goods firms should pursue balanced tax planning strategies that enhance cash flows without increasing information risk.
- ii. Regulators should strengthen disclosure requirements relating to tax strategies to improve transparency.
- iii. Investors should incorporate firm specific characteristics when evaluating the implications of tax behavior.

References

- Ajube, D. T. & Jeroh, E. (2023). Determinants of tax aggressiveness among non-financial listed firms in Nigeria. *International Journal of Applied Research in Social Sciences* 5(7), 17-31.
- Barth, M. E., Beaver, W. H., & Landsman, W. R. (2001). The relevance of the value relevance literature for financial accounting standard setting: Another view. *Journal of Accounting and Economics*, 31(1-3), 77-104.
- Chen, S., Chen, X., Cheng, Q., & Shevlin, T. (2010). Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics*, 95(1), 41-61.
- Desai, M. A., & Dharmapala, D. (2006). Corporate tax avoidance and high-powered incentives.

- Journal of Financial Economics*, 79(1), 145–179.
- Frank, M. M., Lynch, L. J., & Rego, S. O. (2009). Tax reporting aggressiveness and its relation to aggressive financial reporting. *The Accounting Review*, 84(2), 467–496.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
- Jeroh, E. (2023). The moderating effect of tax aggressiveness on the relationship between corporate governance and real earnings management: Evidence from listed Nigerian firms. *International Journal of Management & Entrepreneurship Research*, 5(5), 314-325.
- Lanis, R., & Richardson, G. (2012). Corporate social responsibility and tax aggressiveness: An empirical analysis. *Journal of Accounting and Public Policy*, 31(1), 86–108.
- Ogbeide, I. E., Anyaduba, J. O., & Akogo, O. U. (2022). Firm attributes and corporate tax aggressiveness in Nigeria. *American Journal of Finance*, 7(2), 64–87.
- Okocha, B. N. & Jeroh, E. (2024). Tax shield and the value of listed non-finance entities in Nigeria. *Asian Journal of Management and Commerce*, 5(1), 12-17.
- Rego, S. O. (2003). Tax avoidance activities of U.S. multinational corporations. *Contemporary Accounting Research*, 20(4), 805–833.
- Scholes, M. S., Wolfson, M. A., Erickson, M., Hanlon, M., Maydew, E., & Shevlin, T. (2015). *Taxes and business strategy* (5th ed.). Upper Saddle River: Pearson Hall.
- Sinebe, M. T., Jeroh, E. & Ebiaghan, F. O. (2025). Moderating role of leverage on the relationship between business models and value relevance of accounting information. *GPH-International Journal of Business Management*, 8(3), 17-31.