

GENDER DIVERSITY IN AUDIT COMMITTEE AND TAX AGGRESSIVENESS OF LISTED MANUFACTURING FIRMS IN NIGERIA.

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ABSTRACT

This study investigated the effect of gender diversity in audit committees on tax aggressiveness among listed manufacturing firms in Nigeria. Specifically, it evaluates how the proportion of female members (PFM) and the presence of a female chairperson in the audit committee (FCPAC) influence corporate tax behavior, measured by the Cash Effective Tax Rate (CETR). Adopting a correlational research design, the study population comprises all fifteen (15) food manufacturing firms listed on the Nigerian Exchange Group as at 31st December 2024. Using a census sampling technique, seven (7) firms were selected, including Guinness Nigeria Plc, Nestle Nigeria Plc, Dangote Sugar Refinery, Honeywell Flour Mill Plc, Cussons Nigeria Plc, Unilever Nigeria Plc, and Vita Foam Plc. The study utilizes secondary data obtained from audited annual reports of the selected firms over a ten-year period (2015–2024). Panel least squares regression analysis with fixed effects was employed to analyze the data. Findings reveal that while the overall model is statistically significant, neither the proportion of female audit committee members nor the presence of a female audit committee chair significantly affects tax aggressiveness. The study concludes that gender diversity in audit committees alone does not significantly curb aggressive tax strategies among Nigerian manufacturing firms and recommends a holistic approach to audit committee composition and governance reforms to strengthen tax compliance.

Keywords: Gender Diversity, Audit Committees, Tax Aggressiveness

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1. INTRODUCTION

Over the past two decades, regulators and policymakers have observed a significant increase in the disparity between accounting income reported to shareholders and taxable income reported to the government. Scholars such as Noor et al. (2010) have attributed this growing discrepancy to rising corporate tax aggressiveness. This shift in corporate behavior has resulted in substantial revenue losses for governments due to the underreporting of company income. Consequently, the rise in corporate tax aggressiveness has spurred interest in studying the effect of various audit committee and board characteristics such as board independence and audit quality (G. Chukwu et al. 2020) and the potential influence of gender diversity on a firm's inclination to avoid taxes (Shackelford & Shevlin, 2001; Kim & Zhang, 2011; Koester et al., 2013; Razali et al, 2019).

Shareholders, particularly audit committee members, play a crucial role within corporate governance structures. These shareholders often hold significant equity stakes and exert influence over accounting practices and financial reporting. Gender diversity within audit committees has been shown to positively impact governance and decision-making, as diverse committees benefit from a broader range of perspectives, experiences, and skills. Audit committees with female members tend to be more diligent in monitoring management and mitigating the risk of financial misstatements (Zhong et al., 2017). Their presence can influence managerial behavior and protect shareholder investments through enhanced oversight and enhance firm value (A. Chukwu et al. 2020). Furthermore, research suggests that gender-diverse audit committees are generally less inclined to engage in tax-aggressive practices (Hasan et al, 2016; Mappadang et al., 2018).

Board composition is a critical factor in determining a board's effectiveness in achieving its objectives. A diverse board enriches decision-making by introducing essential skills, varied experiences, and broad viewpoints (Mordi, & Obanya, 2014). Gender diversity, particularly the inclusion of women on corporate boards, is one significant aspect of this broader concept of diversity. Female board members often bring unique perspectives and competencies that can enhance corporate performance and promote ethical behavior. The topic of board gender diversity has been widely discussed over the past twenty years, primarily due to the persistent underrepresentation of women in corporate policymaking roles, especially on boards. Research by Watson and McNaughton (2007) and Alluwia and Sarun (2018) indicates that women tend to be more conservative, risk-averse, and more likely to comply with tax regulations than their male counterparts. Building on this foundation, studies by Aliani et al. (2011), as well as Hoseini et al. (2018), have confirmed

that the presence of women on corporate boards tends to reduce corporate tax aggressiveness.

Although extensive studies have examined the relationship between board gender diversity and tax aggressiveness, particularly in developed economies, the results have often been inconsistent (Salihu et al., 2013; Khan et al., 2017; Hoseini et al., 2018; Mappadang et al., 2018). A notable gap in the literature is that these studies frequently examine gender diversity and tax aggressiveness separately, rather than analyzing their interaction comprehensively. This leaves the influence of gender diversity on a firm's tax behavior underexplored. Given the role that gender diversity plays in monitoring and disciplining managers, thus reducing agency problems, further investigation is warranted.

In particular, there is a limited body of research examining the relationship between board gender diversity and corporate tax aggressiveness within the context of manufacturing companies in Nigeria, especially for the period between 2010 and 2019 (Oyenike et al., 2016; Onyali & Okafor, 2018). For instance, G. Chukwu et al. (2020) studied corporate governance mechanisms and tax aggressiveness, but did not include gender diversity as one of its key variables. This study aims to address that gap by exploring how board gender diversity influences tax aggressiveness in Nigerian manufacturing firms.

1.2. Statement of Problem

Over the last two decades, there has been a notable increase in the discrepancy between accounting income reported to shareholders and taxable income reported to the government. This divergence has been largely attributed to corporate tax aggressiveness, which results in significant revenue losses for governments due to the underreporting of taxable income. While regulators and policymakers have raised concerns about this issue, scholars have also highlighted that corporate tax aggressiveness is a growing phenomenon requiring further investigation. One emerging area of interest is the potential role of gender diversity in influencing a company's inclination toward tax avoidance. Shareholders, particularly those within audit committees, play a critical role in corporate governance by ensuring transparency and accountability in financial reporting. Research suggests that gender diversity in audit committees enhances corporate governance, as female board members tend to exhibit more risk-averse behavior and a higher level of compliance with tax policies. Despite this, the representation of women in corporate boardrooms remains disproportionately low. Several studies have examined the relationship between board gender diversity and corporate tax aggressiveness, primarily in developed economies,

but the findings have been mixed. Some scholars argue that gender-diverse boards contribute to more conservative financial decision-making and a reduction in tax aggressiveness, while others have found no significant correlation.

The existing body of literature presents a key research gap. Most studies on board gender diversity and tax aggressiveness have been conducted in developed countries, leaving a lack of comprehensive research within emerging economies such as Nigeria. Moreover, limited studies have specifically analyzed the relationship between board gender diversity and tax aggressiveness in the context of Nigerian conglomerates. Given the unique corporate governance environment and regulatory frameworks in Nigeria, it is crucial to examine whether gender diversity in audit committee influences tax aggressiveness of manufacturing firm in Nigeria. Addressing this gap will contribute to the broader discourse on corporate governance and tax compliance, offering insights that could inform policy decisions and improve financial transparency in emerging market

Conceptual Framework Model

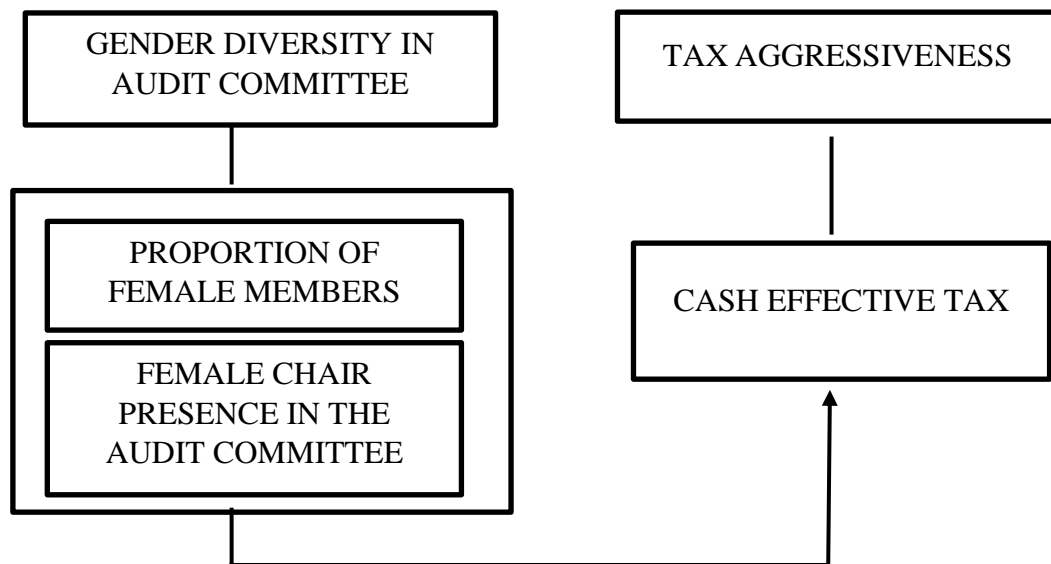


Figure 1:1: Conceptual framework on the effect of Gender Diversity in Audit Committee on Tax Aggressiveness of listed manufacturing Firms in Nigeria.

Source: Lawal et al. (2021)

1.3 Aim and objectives of the study

1. Investigate the effect of proportion of female members on cash effective tax rate of listed food manufacturing firms in Nigeria.
2. Ascertain the effects of female chair presence in the audit committee on cash effective tax rate of listed food manufacturing firms in Nigeria.

1.4 Research Question

1. What is the effects of proportion of female members on cash effective tax rate of listed food manufacturing firms in Nigeria?
2. What is the effects of female chair presence in the audit committee on cash effective tax rate of listed food manufacturing firms in Nigeria?

1.5 Research hypotheses

To achieve the objective of this study, a number of hypotheses were proposed and are tested using data from listed food manufacturing firms in Nigeria

Ho₁: Proportion of female members has on significant effects on cash effective tax rate of listed food manufacturing firms in Nigeria.

Ho₂: Female chair presence in the audit committee has on significant effects on cash effective tax rate of listed food manufacturing firms in Nigeria.

2. REVIEW OF RELATED LITERATURE

2.1. Conceptual Review

Gender Diversity in Audit Committee

Studies on the inclusion of women on corporate boards have gained increasing prominence, largely due to the important role women play in strengthening corporate governance through enhanced monitoring and ethical oversight. Recognizing this, regulatory bodies and governments around the world have implemented measures to promote gender diversity at the board level. For instance, the United States Securities and Exchange Commission (SEC) has mandated that all registered companies encourage diversity in board member selection, thereby reinforcing the governance value of inclusivity (Upadhyaya & Puthenpyrackal, 2020). In a more assertive approach, Norway implemented a mandatory gender quota requiring a minimum representation of women on the boards of publicly listed companies (Rondoy et al., 2021).

Beyond quotas, several jurisdictions have introduced mechanisms rooted in corporate governance principles to support gender inclusion. These mechanisms often require firms to disclose their gender diversity objectives, report progress annually, and explain any deviations from recommended practices an approach exemplified in the “comply or explain” model adopted by various governance codes (Thams et al., 2021; Marquardt & Weidman, 2016). In Sweden, for instance, the government threatened legislative intervention if companies failed to voluntarily increase the proportion of female directors, signaling a broader policy trend toward accountability in gender representation (Adams & Ferreira, 2009).

The push for greater gender diversity is not solely regulatory, it is also grounded in the ethical and behavioral attributes associated with female leadership. Research consistently indicates that women tend to exhibit higher ethical sensitivity and moral reasoning than their male counterparts, stemming from the communal values and socialization patterns often associated with female roles in society (Arun et al. 2015; Pucheta Martínez et al., 2018; Sun et al., 2011). These traits contribute to a more empathetic and stakeholder-oriented approach to decision-making, in contrast to the often more individualistic and risk-tolerant tendencies found among male executives (Bampton & Maclagan, 2009; Eweje & Brunton, 2010; Stedham et al., 2007).

As a result, women directors are generally less inclined to support or condone opportunistic policies that may compromise ethical standards or shareholder interests. Several studies have affirmed that women on boards are less tolerant of aggressive financial practices and are more likely to challenge decisions that could lead to the manipulation of earnings or distortion of financial statements for personal or managerial gain (Ameen et al., 1996; Srinidhi et al., 2011; Zalata et al., 2018). This aligns with earlier research suggesting that women bring distinct value systems and ethical orientations to the workplace, which can significantly influence organizational behavior and strategic outcomes (Chusmir et al., 1989). Therefore, the presence of women on boards can be a critical factor in enhancing transparency, objectivity, and ethical oversight within corporate governance frameworks. Their empathetic disposition and heightened ethical awareness not only contribute to more responsible decision-making but also serve as a check against managerial excesses, ultimately fostering investor confidence and long-term organizational sustainability.

Proportion of Female Members

The proportion of female members on the audit committee refers to the percentage representation of women among the total members of this crucial corporate governance body. This metric has gained increasing attention due to the broader discourse on gender diversity in corporate leadership and its implications for organizational performance, decision-making quality, and governance effectiveness. The inclusion of women on audit committees is particularly relevant in the context of financial oversight, risk management, and ensuring compliance with regulatory standards.

The presence of female members in audit committees is often linked to improved governance outcomes. Research suggests that gender diversity contributes to more ethical decision-making, greater transparency, and enhanced corporate accountability and greater market value (Adams & Ferreira, 2009; A. Chukwu et al. 2020). Women have been observed to exhibit a higher level of diligence in financial monitoring, which is crucial for an audit committee responsible for reviewing financial statements, assessing risks, and ensuring compliance with corporate regulations (Gul et al., 2013).

Moreover, female members may bring different perspectives and skills that enrich discussions on financial oversight. Diversity in viewpoints reduces groupthink, encourages more rigorous scrutiny of financial matters, and fosters a culture of integrity within corporate boards (Bear et al. 2010). The audit committee plays a fundamental role in ensuring that an organization's financial reports accurately reflect its performance, mitigating the risk of financial misstatements and fraud.

Female Chair Presence in the Audit Committee

The presence of a female chair in the audit committee is a significant indicator of gender diversity and leadership within corporate governance structures. This metric is typically measured as a binary variable, taking the value of 1 if the chairperson of the audit committee is female and 0 otherwise. The role of the audit committee chair is critical, as this individual is responsible for overseeing financial reporting, ensuring compliance with regulatory requirements, and maintaining effective risk management practices. As gender diversity in corporate leadership continues to be a focal point for investors, regulators, and governance scholars, the presence of a female chair in the audit committee raises important questions about governance quality, decision-making effectiveness, and organizational performance. According to Adams and Funk, 2012 female leaders bring unique attributes to corporate governance, including higher ethical sensitivity, enhanced

risk awareness, and greater financial conservatism. The chair of the audit committee plays a vital role in ensuring the integrity of financial reporting and regulatory compliance, making leadership effectiveness in this role essential.

Several studies have examined the impact of female leadership in audit committees, with findings indicating that gender diversity enhances financial oversight and improves corporate transparency. For example, Krishnan and Parsons (2008) found that firms with gender-diverse audit committees exhibit higher financial reporting quality and a lower likelihood of earnings manipulation. Similarly, Gavius et al. (2012) argue that female directors, particularly in key oversight roles, contribute to more conservative financial decision-making, reducing the likelihood of corporate fraud. Furthermore, the presence of a female chair in the audit committee may influence organizational culture by promoting greater independence, inclusivity, and stakeholder engagement. Studies suggest that female leaders tend to be more stakeholder-oriented, emphasizing ethical decision-making and corporate social responsibility (Bear et al., 2010). This can be particularly beneficial in an audit committee setting, where oversight responsibilities require unbiased judgment and a commitment to financial integrity. This binary classification allows researchers and analysts to assess the impact of female leadership on audit committee effectiveness, financial performance, and governance outcomes. While simple in structure, this metric provides powerful insights into gender diversity trends and their implications for corporate governance. A female audit committee chair is often associated with higher-quality financial reporting due to increased oversight and ethical considerations. Research by Gul et al. (2013) found that audit committees with female leaders are less likely to engage in earnings management and demonstrate greater transparency in financial disclosures. This aligns with broader findings on gender diversity in corporate governance, where female directors have been shown to exercise more diligent monitoring roles (Francis et al., 2015).

The audit committee chair plays a central role in risk oversight, ensuring that a company maintains robust internal controls and adheres to compliance frameworks. Studies suggest that female leaders in financial oversight positions adopt a more risk-averse approach, leading to stronger internal controls and lower financial misstatements (Adams & Rangunathan, 2015). This is particularly relevant in industries with high financial complexity or regulatory scrutiny, where audit committees must proactively address potential risks before they escalate. Despite the growing emphasis on gender diversity, challenges remain in achieving equal representation in audit committee leadership.

Structural and cultural barriers continue to limit the number of women advancing to senior board positions (Eagly & Carli, 2007).

Tax Aggressiveness

Tax aggressiveness has been defined in various ways by scholars, reflecting the complexity and multidimensional nature of the concept. Hanlon and Heitzman (2010) describe tax aggressiveness as the deliberate reduction of tax liabilities from pre-tax income. In practical terms, this occurs when a manager has the discretion to report increased profits either solely for financial accounting purposes or for both financial and tax reporting, and opts for the former thereby avoiding a corresponding increase in taxable income. Similarly, Palsternak and Rico (2008) argue that tax aggressiveness can involve the strategic exploitation of legal ambiguities. Specifically, when legal provisions overlap or are partially synonymous, taxpayers may choose the interpretation that results in the lowest tax obligation, an act that, while technically legal, borders on manipulation. Nonetheless, Hanlon and Heitzman (2010) acknowledge that such practices are often difficult to detect or conclusively prove. Desai and Dharmapala (2006) offer a broader definition, framing tax aggressiveness as a firm's strategic effort to minimize tax payments to the government through various planning mechanisms. However, a key challenge in the literature is the lack of a universally accepted definition. The term "tax aggressiveness" often encompasses a spectrum of behaviors, from acceptable tax planning to borderline or outright avoidance practices that are considered undesirable from the perspective of tax authorities (Knuutinen, 2013). This definitional ambiguity complicates both scholarly analysis and regulatory responses, underscoring the need for a more standardized understanding of tax-related corporate behavior.

Cash Effective Tax Rate (Cash ETR)

The Cash Effective Tax Rate (Cash ETR) is a vital financial indicator that measures a firm's actual tax burden by relating cash taxes paid to pre-tax income. Unlike the GAAP Effective Tax Rate (GAAP ETR), which is derived from accrual-based tax expenses reported in the financial statements, the Cash ETR is grounded in real cash outflows. As such, it provides a more transparent and immediate reflection of the company's true tax cost and liquidity impact (Dyreg et al., 2008).

This metric is particularly useful for assessing a firm's tax planning behavior and aggressiveness, as it captures the tangible outcome of tax strategies implemented over time. For instance, a consistently low Cash ETR may signal effective tax minimization, but could also raise red flags regarding potentially aggressive or unsustainable tax

practices (Hanlon & Heitzman, 2010). Moreover, the Cash ETR is often considered a more reliable measure for investors and analysts interested in understanding how much cash is truly flowing out of the firm due to taxes, as it is less susceptible to accounting manipulation or deferred tax strategies (Frank et al., 2009).

In contrast to GAAP ETR, which can be affected by temporary differences, such as timing disparities between financial reporting and tax payments, the Cash ETR captures permanent tax avoidance effects more clearly. As such, it serves as a more accurate benchmark for evaluating the efficiency and sustainability of a firm's tax planning activities over time (Chen et al., 2018). Consequently, regulators, policymakers, and stakeholders increasingly view the Cash ETR as a critical metric for analyzing corporate tax behavior and its implications on corporate governance and public policy. G. Chukwu et al. (2020) used this metric as proxy for tax aggressiveness.

Calculation and Interpretation of Cash ETR

The Cash ETR is calculated using the following formula:

$$\text{Cash ETR} = \frac{\text{Cash Taxes Paid}}{\text{Pre-Tax Income}}$$

Gender Diversity and Tax aggressiveness

The analysis of prior studies on the relationship between board gender diversity and corporate tax aggressiveness reveals mixed empirical evidence. For instance, Oyenike et al. (2016) investigated this relationship using data from banks listed on the Nigerian Stock Exchange (NSE) between 2012 and 2014. Employing panel regression analysis, their findings indicated a significant negative relationship between the presence of female directors and tax aggressiveness, suggesting that gender-diverse boards may play a role in curbing aggressive tax behaviors.

Similarly, Hasan et al. (2016) explored the impact of board gender composition on tax aggressiveness in listed Finnish companies for the year 2015. Using panel data regression, they also found a statistically significant negative effect, implying that greater female representation on corporate boards is associated with lower levels of tax aggressiveness. In the context of Iran, Hoseini et al. (2018) examined firms listed on the Tehran Stock Exchange over the period of 2011 to 2015. Through a multivariate regression analysis, their study provided further support for the inverse relationship between board gender diversity and tax aggressiveness, reinforcing the notion that female directors contribute to more ethical and conservative corporate tax practices.

Conversely, Budi (2019) conducted a study on companies listed on the Indonesian Stock Exchange from 2012 to 2017. Unlike the previous findings, the regression analysis revealed no significant relationship between gender diversity on corporate boards and tax aggressiveness, suggesting that the influence of board composition may be context-dependent or mediated by other institutional, cultural, or regulatory factors.

2.2 Theoretical Framework

Agency theory

Jensen and Meckling (1976) picture the agency theory as the link relating the managers and the owners. The theory proposes that, where management is conflicted, they are most probable to make decisions that maximize their selfish interests and not those of the owners. In this case, a monitoring structure is put in place as a control instrument for the owners (Mironov, 2004).

Proponents of this theory assume that companies consist of two contributors, the managers and owners, these two are self-centered and normally unwilling to sacrifice their interests for the interests of the others (Desai & Dharmapala, 2006).

The agency theory is a relevant theory in this study because the institutional ownership and board gender diversity are company's monitoring mechanisms in reducing agency problems. However, with the divorce of owners from managers, tax aggressiveness activities could offer a platform for managers' opportunistic actions, therefore pursuing self-interests at the disadvantage of the owners. Furthermore, institutional ownership can affect tax aggressiveness. Thru the effective monitoring technique. However, the higher the share of institutional investors in a company. The effective management oversight will be. Thus, decreases managerial self-interest behavior to engage in tax aggressiveness practice. Moreover, institutional ownership may perhaps alleviate the agency conflicts between the conflicting parties in the principal-agent contract.

Resource Dependency Theory

The resource dependency theory basis is the fundamental hypothesis that companies supervise their environment by bringing on board resources needed to survive (Pfeffer & Salancik 1978). This theory provided a theoretical basis that the board gender diversity is a resource to the company (Hillman & Dalziel, 2003). Competent female directors bring in social capital resources and advice to management on strategic actions (Poppo & Zenger, 2002). Elmagrhi et al. (2019) opine that women directors

display experience and expertise which contribute to the board effectiveness in monitoring management, hence decrease tax aggressiveness practices.

2.3. Empirical Review

Lawal et al, (2021) investigated the effect of institutional ownership, gender board diversification on tax aggressiveness of quoted conglomerate companies in Nigeria. This study investigated the effect of institutional ownership, gender board diversification on tax aggressiveness of quoted conglomerate companies in Nigeria. The population of the study consisted of the six (6) conglomerate companies listed on the Nigerian Stock Exchange as at 31st December 2019. The study employed the use of explanatory research design and secondary data contained in the annual reports and accounts of listed conglomerate companies for a period of ten (10) years (2010 to 2019) was used for the study. The result of the pooled Ordinary Least Square (OLS) multiple regression analysis revealed a negative significant effect of institutional ownership and gender board diversification on tax aggressiveness of listed conglomerate companies in Nigeria. Based on the findings, the study recommended that the regulatory bodies such as Security and Exchange of Nigeria should set standards for the inclusion of reasonable number of women on the board monitoring committees, because gender diversity in the board decreases tax aggressiveness.

Yahaya, (2025) investigated the relationship between audit committee characteristics and tax aggressiveness in publicly traded companies from 2014 to 2023. The purpose is to explore whether key attributes of audit committees, such as independence, size, meeting frequency, and gender diversity, influence the extent of tax planning activities that deviate from statutory compliance. Using a panel dataset of 153 firms across eleven (11) industries, a pooled (ordinary least squares) regression model was employed to analyze the impact of audit committee attributes on effective tax rates (ETR) as proxy for tax aggressiveness. The findings reveal that audit committee gender diversity and independence are negatively associated with tax aggressiveness, suggesting that robust governance reduces aggressive tax practices. Conversely, size and frequent meetings are positively associated with levels of tax planning, reflecting a balanced approach to tax strategies. The study's originality lies in its decade-long analysis, capturing shifts in corporate governance practices and tax policies over a critical period marked by evolving regulatory environments and global financial challenges. These insights provide practical implications for regulators, policymakers, and corporate boards aiming to optimize governance structures and mitigate tax related risks.

Chang, et al, (2024) studied board gender diversity and corporate social responsibility Based on the Upper Echelons Theory, the Agency Theory and the Resource Dependence Theory, increasing the number of female director to achieve higher level of gender diversity brings forth traits such as compassion, kindness, helpfulness, empathy, interpersonal sensitivity, a willingness to nurture, and a greater concern for others' well-being. These traits help firms form policies that prioritize stakeholders' welfare. Moreover, board gender diversity corresponds to a more diverse and broad background, understanding and experience of business operations, enabling firms to better understand where the key interest groups they face are and what they value. This allows firms to make more effective and better-performing decision in CSR. Through correlation analysis and multiple regression estimation, the principal outcome shows that greater degree of board gender diversity is associated with better CSR performance, confirming the hypothesis that a more gender diversified board enhances the efficiency of monitoring and advising function of board and then forming corporate strategies and implementations toward a better stakeholders' management.

3. METHODOLOGY

The study adopted correlational research design. The population comprised of all food manufacturing firms listed on the Nigerian Exchange Group as at 31 Dec 2024. There were fifteen (15) food manufacturing firms, 31 Dec 2024. In view of the above, seven (7) emerged as the sample of the study using census sampling method in its selection. These include Guinness Nigeria Plc, Nestle Nigeria Plc, Dangote Sugar Refinery, Honeywell Flour Mill PLC, Cussons Nigeria PLC, Unilever Nigeria PLC and Vita foam Plc. For the purpose of this study, secondary data is exploited, while the sources of data was collected from the issued annual reports of the sampled manufacturing firms for the period 2015-2024. The use of secondary data in this study is justified based on the fact that the study is based on the quantitative research methodology, and hence requires quantitative data. The study employed panel least squares regression analysis to examine the relationship between gender-related governance attributes and the Cash Effective Tax Rate (CETR). Fixed effects were applied to account for cross-sectional and period-specific variations across the panel dataset.

Model Specification

$$CETR_{it} = \beta_0 + \beta_1 PFM_{it} + \beta_3 FCPAC_{it} + \mu_{it}$$

Where:

TA= Tax aggressiveness

PFM= Proportion of female member.

FCPAC= Female chair presence in audit committee.

CETR= Cash Effective Tax rate

$\beta_1 - \beta_4$ = Regression coefficient

μ = Residual or error term

$i = 1 \dots N$ (cross sectional unit) $t = 1 \dots T$ (time series unit)

4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

Data analysed here are Proportion of Female Members (PFM), and Female Chair Presence in Audit Committee (FCPAC) and Cash Effective Tax Rate (CETR).

Table 1 Descriptive Statistics

	CETR	PFM	FCPAC
Mean	2.049535	0.472269	0.483772
Median	1.991226	0.477121	0.477121
Maximum	2.949878	0.845098	0.903090
Minimum	1.732394	0.000000	0.000000
Std. Dev.	0.191410	0.213981	0.220016
Skewness	1.720786	-0.414368	-0.635033
Kurtosis	8.556045	2.575403	3.237892
Jarque-Bera	124.5826	2.529005	4.869848
Probability	0.09878	0.282380	0.087604
Sum	143.4674	33.05881	33.86404
Sum Sq.	2.528008	3.159363	3.340079
Observation	70	70	70

The descriptive statistics in Table 1 provide insights into the distribution and characteristics of the variables—Cash Effective Tax Rate (CETR), Proportion of Female Members (PFM), and Female Chair Presence in Audit Committee (FCPAC)—across 70 observations. CETR has a relatively high mean of 2.05 with a maximum of 2.95 and a minimum of 1.73, indicating a moderate spread (Std. Dev. = 0.19) and a highly positively skewed distribution (Skewness = 1.72), further supported by a leptokurtic kurtosis value of 8.56, suggesting extreme values or outliers. The Jarque-Bera statistic for CETR is 124.58, with a probability of 0.09878, indicating potential deviation from normality, though not statistically significant at the 5% level. In contrast, PFM and FCPAC have means of approximately 0.47 and 0.48 respectively, with slightly lower variability (standard deviations around 0.21 and 0.22). Both variables are negatively skewed, with mild kurtosis values indicating near-normal distribution. Their Jarque-Bera test statistics are low, with

probabilities of 0.28 (PFM) and 0.0876 (FCPAC), suggesting no significant departure from normality. Overall, the data suggest CETR is more volatile and less normally distributed than the gender-related governance variables.

Table 2: Unit Root Tests

Variables	ADF t-Statistic	ADF Prob.	ADF Result	Decision
CETR	0.3492	0.0429	I(0)	Stationary
PFM	0.1044	0.0048	I(0)	Stationary
FCPAC	-0.0613	.0163	I(0)	Stationary

Table 2 presents the Augmented Dickey-Fuller (ADF) unit root test results for the variables: Cash Effective Tax Rate (CETR), Proportion of Female Members (PFM), and Female Chair Presence in Audit Committee (FCPAC). The ADF t-statistics for all three variables (CETR = 0.3492, PFM = 0.1044, and FCPAC = -0.0613) are associated with p-values below the conventional 5% significance level (0.0429, 0.0048, and 0.0163, respectively), indicating the rejection of the null hypothesis of a unit root. As a result, all variables are stationary at level, denoted as I(0). This implies that the variables do not require differencing to achieve stationarity, and they are suitable for inclusion in regression analysis without the risk of spurious results caused by non-stationarity.

Table 3 Hausman Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.396773	(6,52)	0.0002
Cross-section Chi-square	33.886598	6	0.0000
Period F	0.596543	(9,52)	0.7939
Period Chi-square	6.878092	9	0.6498
Cross-Section/Period F	2.522119	(15,52)	0.0070
Cross-Section/Period Chi-square	38.268655	15	0.0008

The results from Table 3 (Hausman or Redundant Fixed Effects Test) examine whether fixed effects are necessary in the panel regression model by testing for the presence of significant individual (cross-section) and time (period) effects. The Cross-Section F-statistic (5.396773, $p = 0.0002$) and Cross-Section Chi-square (33.886598, $p = 0.0000$) are both statistically significant at the 1% level, indicating strong evidence of cross-sectional (firm-specific) effects. Conversely, the Period F-statistic (0.596543, $p = 0.7939$) and Period Chi-square (6.878092, $p = 0.6498$) are not significant, suggesting that time effects do not contribute meaningfully to the model. The combined Cross-Section/Period F (2.522119, $p = 0.0070$) and Chi-square (38.268655, $p = 0.0008$) are significant, reinforcing the presence of fixed effects across entities rather than time. Overall, the results support the adoption of a **fixed effects model** based on cross-sectional heterogeneity, but **not** on time-specific variations.

Table 4 Dependent Variable: CETR

Method: Panel Least Squares

Date: 05/13/25 Time: 13:45

Sample: 2015 2024

Periods included: 10

Cross-sections included: 7

Total panel (balanced) observations: 70

Variable	Coeff	Std. Error	t-Statistic	Prob.
C	2.026032	0.081645	24.81485	0.0000
PFM	0.083563	0.106612	0.483810	0.3367
FCPAC	-0.032965	0.105937	-0.311180	0.6569

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)

R-squared	0.460176	Mean dependent var	2.049535
Adjusted R-squared	0.273888	S.D. dependent var	0.181410
S.E. of regression	0.166440	Akaike info criterion	-0.53132
Sum squared resid	1.440519	Schwarz criterion	0.046856
Log likelihood	36.59651	Hannan-Quinn criter	-0.30166

F-statistic	2.309193	Durbin-Watson stat	1.607627
Prob(F-statistic)	0.00000		

The panel regression results provide evidence supporting the null hypotheses (H_{01} and H_{02}), indicating that gender-related governance attributes have no significant impact on the cash effective tax rate (CETR) of listed food manufacturing firms in Nigeria. Specifically, the proportion of female members (PFM) has a positive but statistically insignificant effect on CETR ($\beta = 0.0836$, $p = 0.3367$), while the presence of a female chair in the audit committee (FCPAC) shows a negative but equally insignificant effect ($\beta = -0.0330$, $p = 0.6569$). As both p-values exceed the 0.05 threshold, the study fails to reject the null hypotheses, suggesting that these gender-related variables do not meaningfully influence tax behavior as measured by CETR within the observed period.

Discussion of Findings

The findings from our study, which reveal that gender-related governance attributes—Proportion of Female Members (PFM) and Female Chair Presence in the Audit Committee (FCPAC)—do not significantly influence the Cash Effective Tax Rate (CETR), are partly consistent with and partly divergent from previous empirical studies. For example, our results align with those of Budi (2019), who found no significant relationship between board gender diversity and tax aggressiveness among listed companies in Indonesia, suggesting that the mere presence of women on the board may not directly influence corporate tax behavior across different contexts. However, our findings contrast with those of Oyenike et al. (2016), who reported a significant negative relationship between female directors and tax aggressiveness among Nigerian banks, implying that increased female representation on boards contributed to more conservative tax practices. Similarly, Francis et al. (2014) found that female board members significantly reduced tax aggressiveness in Finland, and Hoseini et al. (2018) also documented a significant negative relationship in Iranian firms. The inconsistency between our findings and those of earlier studies may be attributed to contextual factors such as differences in industry focus (our study covers multiple sectors beyond banking), governance structures, cultural influences, and methodological approaches. These results suggest that while gender diversity in governance is important, its isolated impact on tax behavior may vary depending on broader organizational and institutional environments.

5. CONCLUSIONS AND RECOMMENDATIONS

This study investigated the effect of Gender Diversity in Audit Committee on Tax Aggressiveness of listed manufacturing Firms in Nigeria. The findings reveal that, although the overall model is statistically significant, the individual variables (PFM and FCPAC) do not have a statistically significant impact on CETR. This indicates that the presence of women in governance roles, in isolation, does not significantly shape corporate tax behavior within the context of the sampled Nigerian firms over the study period. These findings contrast with some prior studies conducted in other jurisdictions, which reported significant relationships between board gender diversity and corporate tax aggressiveness, thereby underscoring the influence of contextual factors such as regulatory environments, industry type, and board dynamics. Based on these findings, it is recommended that;

1. While efforts to promote gender diversity in corporate governance should continue for broader inclusivity and ethical representation, stakeholders should not assume that gender diversity alone will result in improved tax transparency or conservative tax behavior.
2. Policymakers and regulators should consider strengthening corporate governance frameworks by incorporating additional oversight mechanisms and training programs that align board members' responsibilities with ethical financial reporting and tax compliance.
3. Furthermore, future research should explore the interaction of gender diversity with other board characteristics such as independence, expertise, and board size, as well as the moderating effects of industry type and regulatory enforcement, to gain deeper insights into the determinants of tax behavior in corporate governance.

Competing Interest: The authors declare that there is no competing or conflicting interest in this manuscript.

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