

Governance Dynamics and Cost of Debt: Insights from Listed Companies in Nigeria**Adamu Adamu Idris**

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mmmkwalle@yahoo.com**Abstract**

It is very vital for companies to efficiently manage its finances, which can come from either debt or equity. This study investigates the effect of board and ownership structure on cost of debt on listed industrial goods companies in Nigeria. Utilizing a longitudinal panel design, data were collected from the annual reports and accounts of ten sampled firms listed on the Nigerian Stock Exchange over nine years (2014-2022). The research employs multiple regression analysis to examine the relationship between board attributes—such as board independence, board gender diversity, and managerial ownership—and cost of debt. Findings reveal an insignificant relationship between board independence and cost of debt, suggesting that the proportion of independent directors on the board does not significantly influence borrowing costs for industrial goods companies in Nigeria. However, board gender diversity and managerial ownership were found to have a significant impact on cost of debt. The study concludes with recommendations for enhancing board attributes and ownership structure to improve cost of debt, thereby contributing to the broader discourse on corporate governance in the Nigerian industrial goods sector.

Keywords: Cost of debt, board independence, board gender diversity, Nigeria

1. Introduction

Cost of debt is considered essential to a company's success because it can substantially influence its operational success as well as the overall valuation (Olanipekun & Adelekan, 2022). A company's primary objective is to enhance shareholder's wealth by generating profits and increasing the value of their shares. To achieve this, the company must efficiently manage its finances, which can come from either debt or equity. Firms finance their activities using funds from debt and equity. However, most successful companies depend on debt more than equity fund (Ertugrul & Hegde, 2008). It has been established that the value of borrowing is much greater than equity funding only from its owners and companies with mixed financing (i.e internally and externally) as having more weight in the marketplace than companies funded by owners. However, the importance of debt as a source of funding for companies needs to be approached carefully because excessive debt could affect companies' riskiness which would eventually affect the shareholder's wealth (Ertugrul & Hegde, 2008). Debt is one way to secure funds from external parties, specifically creditors and the funds provided by creditors in terms of funding of the company incur debt costs for the company. As a result, debt financing has been an issue of concern

for companies worldwide in recent times due to the benefits and costs associated with it. Some companies such as the industrial goods companies choose their optimal debt ratio by balancing the associated benefits and cost. The study of Ghouma (2017) justified a preference for debt financing over equity on the ground that the signalling attributes of debt assist in reducing information asymmetry between companies' managers and investors which in effect reduces the future cost of financing.

Cost of debt offers investors insight into a company's risk level relative to others, as riskier companies typically face higher debt costs and also companies with more extensive working capital tend to experience a higher borrowing cost. Debtholders, when making investment decisions estimate the firm's risk profile. This risk profile determines the required return by debtholders, which in turn is the firm's cost of debt. However, the importance of debt as a source of funding for companies needs to be approached carefully because excessive debt could affect companies' riskiness which would eventually affect the shareholder's wealth (Ertugrul & Hegde 2008). Ghouma (2017) posited that the benefit of debt financing is its monitoring role since highly geared companies tend to pay significant attention to debt market reaction. Therefore, firms can maximize shareholders' wealth through a reduction in the overall cost of capital by using more debt capital than equity capital while also taken into consideration the risks and return of each of these financing vehicles. Lorca et al. (2011) suggested that effective corporate governance mechanism can reduce debt cost by minimizing the conflicts of interest between companies and their creditors. This is based on the philosophy that debtholders take a firm's corporate governance (board independence, board size, board gender diversity among others) into account when estimating its default risk, therefore implying that the quality of corporate governance influences the cost of debt.

The presence of independent boards as one of the features of corporate governance serves to balance the process of decision making and provide better supervision, especially in safeguarding the interests of minority shareholders and other stakeholders (Marrakchi et al., 2001). Independent directors generally perform a better monitoring role than affiliated or inside directors regarding shareholder welfare (Fields & Keys, 2003). This is consistent with the reputational concerns of these directors as professional referees because some monitoring functions such as the reduction of managerial shirking or perquisite consumption, and the improvement of financial disclosure and transparency also redound to creditors' benefit (Armstrong et al., 2014). An average beneficial effect of board independence on the cost of debt, however, does not necessarily suggest there are no costs of independence on bondholders, it may simply suggest that the overall benefits of independence dominate its costs. Board gender diversity is as well one of the important characteristics of an effective board (Milliken & Martins, 1996). In contrast to males, females on the board are found to be more independent, diligent, and responsible and their presence increases the discussion and exchange of ideas among the group. Städtler (2016) shows a relation between gender equality in the board of directors and the cost of debt in one-tier board system. Similarly, Usman et al. (2019) suggests that a mixed-gender board eliminate information asymmetry between management stakeholders, management's opportunistic behaviour, and the probability of default on loans and cost of debt based on creditor perceptions.

The ownership structure consists of proportion of shares held by institutions (institutional ownership), foreign investors (foreign ownership), Family (family ownership), managers (managerial ownership) and others (Manukaji, 2020). Ownership structure is one of the main causes of agency problems between managers and shareholders or controlling and minority

shareholders. An imbalance between ownership, control, and supervision can create opportunities for some parties to take advantage of others. The separation of ownership leads to many conflicts and controversies among shareholders, stakeholders and management behaviour (Namazi & Kermani, 2013). Studies conducted by Shadrach and Ali (2023) found managerial ownership have an impact on cost of debt. But their findings contradict the results of Muharam and Putri (2020), Ahmad et al. (2018) who reported that managerial ownership has a negative effect on cost of debt.

The rising cost of debt has been an issue of concern globally. This issue is worst in developing countries like Nigeria where the capital market is underdeveloped and faces multiple challenges such as, inadequate market infrastructure, weak or inappropriate regulation and supervision and lack of reliable information on the issuers which can hinder investors to actively participate in the capital market (Wasiu & Muideen 2020). This has been a fundamental issue in the rising cost of debt because more participation of investors in company's securities has the tendency to reduce the company's cost of debt while the lesser the participation the higher the cost of debt.

More so, researchers like Putri (2019) focused on financial institutional sector neglecting non-financial sector like industrial goods sector. Thus, the findings of such studies become very difficult to be generalized within the different industry and country. This will be as a result of regulatory differences such as the protection of outside investors against expropriation by managers or controlling shareholders, risk of uncertainty surrounding expected future cash flows, agency cost, monitoring cost, and the problem of information asymmetry. Hence, the effect of board and ownership structure may vary from industry to industry and country to country. There is need to investigate whether board and ownership structure may influence the cost of debt and it is in view of the above that this study seeks to examine the effect of board and ownership structure on cost of debt of listed industrial goods companies in Nigeria. Therefore, the main objectives of this study are to examine the effect of board and ownership structure on cost of debt among listed industrial goods companies in Nigeria.

2. Literature Review

This section presents the review of relevant literature on board and ownership structure on cost of debt. It also offers discussion on theoretical framework, review of empirical studies.

2.1 Agency Theory

The agency theory, as outlined by Jensen and Meckling (1976), arises primarily from the division between ownership and management. The agency theory highlights the most relevant agency issues in today's institutions, particularly since separation of ownership and control exist. In many companies today, shareholders (the owners) delegate the management of the firm to professional managers who may not have a significant ownership stake. This separation creates potential agency issues between the shareholders and managers. The interests of the managers may not always align with those of the shareholders or creditors. In relation to the cost of debt, the agency theory emphasizes on how those conflicts can influence the perceived risk and borrowing costs for a company as shareholders often prefer riskier projects since they stand to gain more if those projects are successful (leading to higher returns), while creditors take on more downside risks in the case of failure. To protect themselves against such risking behavior, creditors may impose restrictive covenants or charge a higher interest rate therefore increasing the overall cost of debt. Furthermore, managerial decisions that increases financial risk, such as excessive leverage or poor cashflow managements may make creditors view the company as a higher credit risk and as a result, they may demand more interests to compensate for the likelihood of default. In essence, agency theory

highlights how stakeholder conflict and the associated costs, including monitoring, bonding and risk premium impact the cost of debt. Effectively addressing these conflicts can lower the borrowing costs for a firm.

One key agency issue is that managers might prioritize their personal goals such as increasing their compensation or job security over maximizing the shareholders' value. This misalignment can lead to decisions that are detrimental to the company's performance, such as excessive spending on projects that do not yield high returns or avoiding risky but potentially profitable investments. observational evidence to explain both the nature of these agency problems and how to settle them has been documented by Jensen and Meckling's (1976) fundamental work through proposing the theory of the firm which is based on conflicts of interest among the stakeholders involved, equity holders, executives and debt holders. The separation between ownership and management causes the possibility of mismatch between the utility functions of shareholders and managers, which could lead to decisions that do not maximize the utility of both agents. When this happens, they may have to support the effects of decisions (investing or financing) not inspired by the paradigm of maximizing the wealth of shareholders and as a result the company may still be faced with the effective loss of value. The agency theory examines the conflict of interest between the principal and agent from its origin, along with the associated risks and agency costs, and suggests solutions and strategies to help mitigate them. Some of these suggested solutions are internal such as mechanism for monitoring management, managing information systems or implementing incentive systems. Others are external in nature, involving factors like the impact of share prices, pressure from capital markets, the use of debt and regulations governing industries and markets. The unique combination of these internal and external elements forms the corporate governance structure of a firm. Most of the prior studies relating Corporate governance and cost of debt capital have concentrated on ownership structures, voting rights, shareholder rights, and anti-takeover factors (Ashbaugh et al., 2004; Cheng et al., 2006; Farooq & Derrabi, 2012). A review of the corporate governance literature revealed that other important attributes can impact the perception of monitoring mechanisms held by shareholders and lenders because these attributes played a role in reducing information asymmetry and agency problems in the capital markets and consequently reduced cost of raising fund form lenders (debt) (Anderson et al., 2004).

2.2 Empirical Review

This section typically focuses on the existing relevant research studies that have used empirical methods to investigate the impact of board and ownership structure on the cost of debt.

2.2.1 Board independence and cost of debt

Board independence is one of the key governance mechanisms in addressing agency issues. Sani and Alifiah (2021) reported a significant negative relationship between board independence and cost of debt on 56 non-financial companies listed on the Nigeria. The study suggested that firms with a higher proportion of independent directors tend to use less debt. The finding implies that independent directors play a very crucial role in monitoring management decisions, leading to more prudent financing choices and a preference for lower debt costs. Derbali et al., (2020) examined the influence of corporate governance attributes on firms' cost of debt, using a sample of 486 U.S firms covering the period from 1998 to 2017. They discovered that board independence has significant negative effect on the cost of debt as the creditors value the presence of independent directors on the company's board, leading to a reduction in the cost of debt.

On the contrary, Sayanolu (2020) examined the impact of corporate governance mechanism on the cost of debt. over a period of 9 years from 2008 to 2017. Based on the research, a significant positive relationship was found between board independence and the cost of debt, suggesting that firms with a higher proportion of independent directors may face increased borrowing costs. Malakeh (2021) investigated how various board characteristics influence the cost of debt in small and medium sized enterprises (SMEs). The study analyses a sample of 2,576 SMEs, resulting in 8,742 firm year observations. The data covers a 6 years period ranging from 2013 to 2018. The researcher posited that a greater presence of independent directors is linked to a higher cost of debt, which may imply that lenders view independent directors as less familiar with the firms' operations and thereby increasing perceived risk. The study revealed that board independence has a significant positive relationship with the cost of debt.

Abdullahi and Yahaya (2023) studied how various board characteristics affect the cost of capital for firms listed on the main board of the Nigerian exchange using a sample of 133 listed firms for a period of 15 years, covering the period from 2008 to 2022. The researchers employed the generalized method of moments (GMM) to estimate the relationship between board characteristics and the cost of debt. The result showed that board independence had no significant relationship with the cost of debt or the overall weighted average cost of capital.

Furthermore, the study by Bradley and chen (2015) tested how board independence affects the cost of debt using the Sarbanes-Oxley Act (SOX) and changes in listing standards as a natural experiment to assess this relationship. The study suggested that board independence does not have a universally positive or negative effect on the cost of debt, but instead, the impact depends on firm-specific factors such as leverage and market conditions. The result therefore, showed that board independence has a mixed effect on the cost of debt. In this regard, the study hypothesized that,

HO₁: Board independence has a significant effect on cost.

2.2.2 Board gender diversity and cost of debt

Diversity on the corporate board is important. Studies previously have highlighted the benefit of having female directors on the board (Bala et al., 2020; Idris & Usman, 2021; Idris et al., 2024; Sheidu et al., 2023; Idris et al 2019). Usman et al., (2019) examined the impact of board gender diversity on firms' borrowing costs. The research analyzes data from all A-share listed companies on the shanghai and Shenzhen stock exchanges for a period of 6 years, ranging from 2009 to 2015. The result reveals a significant negative relationship between board gender diversity and cost of debt. Indicating that having female directors on the board leads to reduction in the cost of debt. Specifically, the study also shows that companies with at least one female board member experience a 4% reduction in borrowing costs compared to those with no female board members. Aksoy and Yilmaz (2023) also studied how board characteristics influence the cost of debt for non-financial firms in Turkey, using a sample of 211 listed Non-financial companies. The findings show that the presence of female directors on the board is associated with a reduction in the cost of debt and a decrease in the creditors' perceptions of default risk, which implies a significant negative effect of board gender diversity on the cost of debt.

Similarly, the study conducted by Mansour et al., (2024) investigated the impact of board gender composition on the cost of debt in Jordanian non-financial firms, utilizing the data from 113 non-financial companies listed on the Amman stock exchange (ASE) between 2010 and 2019. Their findings indicated that firms with higher proportion of female directors benefit from an average

reduction of 0.75% in interest rates compared to firms with fewer female directors which implies that increased female representation on boards can lead to economic advantages by lowering the borrowing costs. The finding is consistent with Rakesh et al., (2020) who discovered a negative relationship between female board representation and the cost of debt among Australian listed companies. The research findings reveal that the existence of female directors on the board is negatively associated with the cost of debt, suggesting that firms with greater gender diversity on their boards may benefit from lower cost of debt.

However, Malakeh (2021) which investigates how various board characteristics, including gender diversity influence the cost of debt in small medium-sized enterprises (SMEs) across Europe, shows that an increased presence of female directors on the boards of SMEs is associated with a higher cost of debt. This proposes that lenders may perceive firms with greater board diversity as riskier due to prevailing biases or assumptions about decision making dynamics introduced by increased diversity. In contrast, Mokhtari (2020), documented that board gender diversity does not have a significant effect on the cost of debt of insurance firms listed on the Tehran stock exchange. The research implies that the participation of female directors on the board do not influence the creditors' perceptions or the terms of debt financing. Following the review of these study, we hypothesized that,

H0₂: Board Gender diversity has significant effect on cost of debt.

2.2.3 Managerial Ownership and Cost of Debt

Managerial ownership represents the percentage of a company's shares that are owned by its executives, directors and other key managers. Juan and Garcia-Meca (2011), explored how various ownership structure influence a firm's cost of debt. The study discovers that managerial ownership has a negative effect on the cost of debt, reasons being that as managerial ownership increases, the interest of the managers aligns with those of the shareholders, making the creditors more confident in the firm's risk management. Similarly, Depoers et al., (2023), using a sample of 221 French listed companies showed that managerial ownership reduces the cost of debt. The studies noted that managers tend to act more cautiously, which reassures creditors and leads to a lower debt cost. Also, the research conducted by Steve Lin et al., (2023) revealed a negative relationship between managerial ownership and the cost of debt, because higher debt covenants protects creditors by mitigating the potential agency conflicts between the managers and debtholders, thereby reducing the firm's cost of debt.

In contrast, Shuto and Kitagawa (2011) examined the effect of managerial ownership on the cost of debts using firms from the Japanese stock exchange for the period 1997 to 2004. Data on bond issues during the sample period were collected from bond database. Their results showed that managerial ownership is positively associated with the interest rate spreads on corporate bonds. This suggests that as managers hold more equity, the cost of debt for the firm rises. Likewise, Shadrach and Ali (2023) assessed the effect of managerial and institutional ownership on the cost of debt of listed insurance companies listed on the Nigeria stock exchange over a 12-year period from 2010 to 2021. The study found a positive and significant impact of managerial ownership on the debt financing of listed insurance companies in Nigeria. This result is similar to the finding of Siska Widia Utami (2021) from Indonesian market who also documented no significant association between cost of debt and that the proportion of shares held by management. Consistent with these reviews, this study hypothesized that,

H0₃: Managerial ownership has no significant effect on cost of debt.

3.1 Methodology

This study adopts a longitudinal and correlational research design because it spans an extended period and aims to examine the relationship between the dependent and independent variables. The population of this study comprises thirteen (13) industrial goods companies listed on the Nigeria Exchange Group from 2014 to 2022. Using purposive sampling, the study selected nine companies which are used in the analysis. This study employs the regression analysis as the primary method of data analysis. This method was selected because it enables the investigation of the relationship between the dependent and independent variables. Table 1 present the measurement of variables

Table 1 Measurement of Variables

Variables	Category	Acronyms	Measurement	Sources
Cost of Debt	Dependent Variable	COD	Measured as the interest expense divided by average total debt	Stefany and Joni (2020)
Board Independence	Independent Variable	BIN	Measured as the Proportion of non-executive directors to the total directors on the board	Abdulkarim and Bahamman (2021)
Board Gender-Diversity	Independent variable	BGD	Measured as the percentage of female directors to the total board size.	Abobakr & Elgiziry (2015)
Managerial Ownership	Independent Variable	MAO	Measured as the percentage of the total shares owned by the management (directors and commissioners) to the total shares outstanding.	Siska Widia Utami (2021)
Leverage	Control Variable	LEVG	Measured as the Total Debt divided by total assets.	Nazir (2021)

Liquidity	Control Variable	LQD	Measured by the current Assets divided by Current Liabilities	Angela Dirman (2020)
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3.2 Model of the study

The model of this study is formulated to examine the relationship between board and ownership and the cost of debt. The regression model is presented below;

$$COD = \alpha_{1it} + \beta_1 BIN_{it} + \beta_2 BGD_{it} + \beta_3 MNGOWN_{it} + \beta_4 LEVG_{it} + \beta_5 LQD_{it} + e_{it}$$

Where;

COD = Cost of debt

BIN = Board Independence

BGD = Board Gender-diversity

MNGOWN = Managerial Ownership

LEVG = Leverage

LQD = Liquidity

e = Error term

4. Results and discussion

4.1 Descriptive statistics

The descriptive statistics for the study are summarized in Table 1 below, which includes the maximum and minimum values, the standard deviation, as well as the skewness and kurtosis of the variables used in the study.

Table 1. Descriptive statistics

Variable	OBS	Mean	Std. Dev	Min	Max
COD	90	0.177	0.219	0.000	1.573
BIN	90	0.375	0.227	0.091	0.875
BGD	90	0.209	0.169	0.000	0.667
MNGOWN	90	0.066	0.133	0.000	0.563
LEVG	90	0.172	0.171	0.000	0.748
LQD	90	9.990	81.573	0.109	775.222

NOTE: COD =Cost of Debt, BIN =Board independence, MNGOWN =Managerial ownership, LEVG =Leverage, LQD =Liquidity

Table 1 reveal a mean value of 0.177 for cost of debt (COD) and a standard deviation of 0.219 which means that the data points deviates from the mean with a spread of approximately 21.9% indicating that the data is widely dispersed around the mean. The range of cost of debt (COD) is between the minimum value of 0.000 and maximum value of 1.573. The table also shows that Board independence (BIN) has a mean value of 0.375 and a standard deviation of 0.227 which means that the data points differs from the mean by 22.7%. The board independence (BIN) values also range from 0.091 (minimum) to 0.875 (maximum) indicating variability in the proportion of the independent directors on the company's board. The data for Board-gender diversity (BGD) also has a value of 0.209 as the mean with a standard deviation of 0.169 which implies that the data for Board gender diversity (BGD) deviates from both sides of the mean by 16.9%. The board gender diversity has a minimum and maximum value of 0.000 and 0.667 respectively. The managerial ownership (MNGOWN) also reveals a mean value of 0.066 and a standard deviation of 0.133 which shows a substantial variability with the data points spreading 13.3% around the mean. The range of managerial ownership (MNGOWN) values is between the minimum and the maximum with the values 0.000 and 0.563 respectively.

4.2. Correlation Matrix

The correlation matrix is presented in Table 2 below and it shows the summary of the correlation coefficients of the variables under study.

Table 2. Correlation Matrix of the Sampled Observations

	COD	BIN	BGD	MNGOWN	LEVG	LQD
COD	1.000					
BIN	0.067	1.000				
BGD	-0.119	0.129	1.000			
MNGOWN	-0.101	-0.067	-0.116	1.000		
LEVG	-0.184	0.033	-0.303*	0.018	1.000	
LQD	-0.068	-0.094	0.019	-0.052	0.011	1.000

Source: Stata output 2025

Table 2 shows that Board independence (BIN) has an insignificant positive correlation with Cost of debt (COD) at a correlation coefficient of 0.067 which implies that board independence has a positive association or positively contributed to the cost of debt of the sampled industrial firms during the period of study.

Table 2 also reveals that Board gender diversity (BGD) has a negative correlation with cost of debt (COD) at a correlation coefficient of -0.119, which implies that the board gender diversity (BGD) has an inverse effect on the cost of (COD), suggesting that a higher gender diversity on the board may be associated with a lower cost of debt. On the contrary, board gender diversity (BGD)

positively affects the board independence (BIN) at a coefficient of 0.129, which means that more diverse board might also have more independent members.

Table 2 also shows that managerial ownership negatively correlates with cost of debt (COD), Board independence (BIN) and Board gender diversity (BGD) at a coefficient of -0.101, -0.067 and -0.116 respectively. This indicates that as the level of managerial ownership (MNGOWN) increases, the cost of debt (COD) among sampled industrial goods companies decreases.

Table 2 also reveals that liquidity (LQD) is negatively associated with cost of debt (COD) at a coefficient of -0.068, implying that liquidity has an inverse relationship with cost of debt (COD). Similarly, liquidity also has a negative correlation with board independence (BIN) as well as managerial ownership (MNGOWN) at a correlation coefficient of -0.094 and -0.052 individually, which means that as these variables are inversely associated with liquidity. Meanwhile, board gender diversity (BGD) and leverage (LEVG) reveal a positive correlation with liquidity (LQD) at a coefficient of 0.019 and 0.011 which indicates that there is a positive association between liquidity (LQD), board gender diversity (BGD) and leverage (LEVG).

4.3 Data Normality Test

The result for shapiro-wilk test was performed to examine whether the study variables follows a normal distribution, with the null hypothesis stating that the data are not normally distributed because the p-value is significance. The result is presented in Table 3 below.

Table 3. Result of shapiro-wilk Test for Normality

VARIABLE	OBS	W	V	Z	P-VALUE
COD	90	0.632	27.809	7.334	0.000
BIN	90	0.874	9.498	4.965	0.000
BGD	90	0.956	3.323	2.648	0.004
MNGOWN	90	0.518	36.478	7.933	0.000
LEVG	90	0.866	10.143	5.110	0.000
LQD	90	0.087	69.089	9.341	0.000

Source: Stata output 2025

Table 3 reveals that cost of debt (COD), Board independence (BIN), Managerial ownership (MNGOWN), Leverage (LEVG) and Liquidity (LQD) have a W-coefficient of 0.632, 0.874, 0.518, 0.866 and 0.087 respectively, which are all significant at the P-value of 0.000. while Board gender diversity (BGD) has a W-coefficient of 0.956 with a P-value of 0.004. The study therefore accepts the null hypothesis that the data for the study variables are not normally distributed and rejects the alternative hypothesis which suggests data normality.

4.4 Test for Multicollinearity

To assess the multicollinearity among the variables of the study, the variance inflation factor (VIF) test was carried out and the result is shown in Table 4 below.

Table 4. Multicollinearity

Variables	VIF	TOLERANCE (1/VIF)
BGD	1.14	0.878
LEVG	1.11	0.903
BIN	1.04	0.965
MNGOWN	1.02	0.981
LQD	1.01	0.987
MEAN VIF	1.06	

Source: Stata output 2025

Table 4 shows that Board gender diversity (BGD) has a VIF of 1.14 and a tolerance level of 0.878, leverage (LEVG) has a VIF of 1.11 with a tolerance level of 0.903, Board independence (BIN) also has a VIF of 1.04 and a tolerance level of 0.965, while the managerial ownership (MNGOWN) and liquidity (LQD) reveals a VIF of 1.02 and 1.01 with a tolerance level of 0.981 and 0.987 respectively. The table also shows that the mean VIF is 1.06 and the VIF for all the variables are lower than 5 with the tolerance levels higher than 0.10 which provides evidence of the absence of Collinearity between the variables of the study.

4.5 Heteroskedasticity Test

The heteroskedasticity test is to check the existence or otherwise of heteroskedasticity, and also assess whether the variance of residuals (error term) is constant across all levels of the independent variables. The result of the test is shown in Table 4.5 below.

Table 5. Result of Heteroscedasticity

TEST	Chi2(1)	Prob>chi2
Hettest	32.18	0.000

Source: Stata output 2025

The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was undertaken to test the heteroskedasticity. Table 5 shows that the heteroskedasticity test (Hettest) has a chi-square of 32.18 with a P-value of 0.000. Therefore, the study rejects the null hypothesis which states that there is absence of heteroskedasticity and accepts the alternative hypothesis that there is an evidence of heteroskedasticity, since the P-value is lower than the threshold of 5% significance level.

4.6 Regression Analysis

This section presents the regression analysis and the test of the developed hypothesis. It also includes the Hausman test and the result is presented in Table 6 below.

Table 6 Result of Hausman Test

TEST	Chi2(5)	Prob>chi2
Hausman test	3.96	0.555

Table 6 shows that the Hausman test has a chi-square of 3.96 with a P-value of 0.555 which implies that the P-value is higher than the threshold of 0.05. Therefore, the study fails to reject the null hypothesis, suggesting that the linear regression model is more preferred as a simpler alternative

and as result of the small number of groups in the random effects test which limits the reliability of these tests. The result is presented in Table 4.7 below.

Table 7 OLS Regression Results (Robust linear regression model)

COD	COEF.	ROBUST STD. ERR	T	P>T
BIN	0.087	0.136	0.64	0.524
BGD	-0.284	0.122	-2.33	0.022
MNGOWN	-0.196	0.092	-2.13	0.036
LEVG	-0.321	0.147	-2.19	0.031
LQD	-0.0001576	0.0000357	-4.42	0.000
CONS	0.274	0.071	3.88	0.000

Source: Stata output 2025

4.6.1 Board independence and cost of debt

The regression result shows a positive but statistically insignificant relationship between board independence (BIN) and cost of debt (coefficient = 0.087, p-value = 0.524). This indicates that an increase in the proportion of independent directors on the board is not significantly associated with a reduction in cost of debt. This result is in line with the findings of Abdullahi and Yahaya (2023) but contrary to that of Sani and Alifiah (2021) and Derbali et al., (2020).

This may be as a result of several factors such as the possibility that lenders in Nigeria place greater emphasis on financial indicators (such as liquidity and leverage) rather than governance structures when assessing credit risk, and presence of independent directors which may not always translate into an effective oversight, particularly if such directors lack autonomy, financial expertise, or the willingness to challenge management. Thus, the study reject the hypothesis one as board independence (BIN) was found to have no significant effect on cost of debt (COD) 4.6.2 Board gender diversity and Cost of debt

On gender diversity, the result shows that board gender diversity (BGD) has a significant negative relationship with Cost of debt (Coefficient = -0.284, P-value = 0.022), suggesting that a greater female representation on the board is associated with lower borrowing costs among the sampled industrial goods companies in Nigeria. This result is in line with the findings of Usman et al., (2019); Aksoy and Yilmaz (2023), Mansour et al., (2024) and Rakesh et al., (2020). The finding supports the Agency theory, which states that gender-diverse boards can enhance the board effectiveness and monitoring. Additionally, board gender diversity improves transparency as well as stakeholder communication, which may reduce information asymmetry between firms and lenders, thereby reducing the perceived credit risks and resulting in a lower cost of debt. The study, therefore, accept the hypothesis two that board gender diversity (BGD) has significant impact on the cost of debt of listed industrial goods companies in Nigeria, as the increase in board gender diversity inversely reduces the cost of debt.

4.6.3 Managerial Ownership and Cost of Debt

The result also shows that managerial ownership (MNGOWN) has a negative significant effect on Cost of debt (coefficient= -0.196, P-value=0.036). This means that as managerial ownership increases, the cost of debt among the sampled industrial goods companies tends to decrease. This result is in line with the findings of Juan and Garcia-Meca (2011); Depoers et al., (2023) and Steve Lin et al., (2023). Higher managerial ownership may signal to lenders that management is committed to the long-term performance and sustainability of the company, which therefore

reduces the perceived risk, potentially leading to more favorable loan terms, lower interest rates, or relaxed collateral requirements, and as a result decreasing the overall cost of debt. Thus, the study accept hypothesis three. The result indicated that managerial ownership (MNGOWN) has significant effect on the cost of debt (COD) of listed industrial goods companies in Nigeria as an increased managerial ownership reduces the cost of debt by mitigating agency conflicts and reassuring creditors of management's commitment to financial discipline.

5. Conclusions

This study examined the effect of board and ownership structure on cost of debt of listed industrial goods companies in Nigeria. The presence of independent directors on the boards of industrial goods companies in Nigeria, while theoretically important for governance, does not translate to significant reductions in borrowing costs. This suggests that lenders may not place substantial value on board independence as a risk-mitigating factor in their lending decisions, or that independent directors in these companies may not be effectively exercising their monitoring roles.

Gender diversity on corporate boards represents a significant value-adding governance mechanism that can reduce financing costs. The presence of female directors appears to enhance board effectiveness, improve transparency, and reduce information asymmetry, thereby lowering perceived credit risks and resulting in more favorable borrowing terms.

Higher managerial ownership serves as an effective mechanism for aligning managers' interests with those of creditors. When managers have significant ownership stakes, they are likely to make more strategic financial decisions, which creditors reward with lower borrowing costs.

Based on the reported results, the study recommends that the owners of the firm should consider in addition to the existing policy, the increase of female directors on their boards. Also, strategically, devise more ways to offer more stake to managers as these will drive for lowering the cost of debt.

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