Board Attributes and Risk Disclosure of Quoted Industrial Goods Companies Listed in Nigerian Exchange Group

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Abstract
This study responds to recent calls for more research on this subject by empirically examining the effect of board attributes on risk disclosure of quoted industrial goods firms listed on the Nigerian Exchange Group. This study adopts an ex post facto research design. The population of the study comprised all the 13 listed industrial goods firms. Data were extracted from the published financial statements of the industrial goods companies, covering a period of ten (10) years from 2013 to 2024. Risk disclosure was measured using dichotomous scale "1" if a company discloses risk in the financial statement, "0" otherwise. The study employs logistic regression as the technique of analysis with the aid of STATA version 16 as a tool for analysis. The results indicate that board independence, board size and board gender diversity all have significant effects on the extent of risk disclosure in industrial goods companies listed on the Nigerian Exchange Group. The study concluded that the composition is a viable corporate mechanism for improved voluntary disclosure such as risk disclosure in industrial goods companies. This study recommends that the Nigerian industrial goods sector be composed of boards with diversities such as gender, expertise, and nationality, especially the independent directors who can bring their experiences to bear in making decisions with respect to risk information disclosures.

Keywords: Board independence, Board size, Board gender diversity, Risk disclosure, Industrial goods firms, Nigeria

Introduction

Transparency in financial reporting has attracted increased attention following the major scandals and corporate collapses of the early 2000s, the global financial crisis and the most recent collapses of giant companies in both developed and developing economies. These collapses emphasized the need for information and good corporate governance. Besides, there is an increasing demand for high-quality information for investors' decision-making processes. Nigeria was not immune from these events and gave more importance to transparency and good corporate governance practices. Accounting literature emphasises the importance of risk disclosure to fulfil the demand of their stakeholders to assess the company's risk profile and the firm market value (For instance, Abraham, Abdul, Mohamed & Ahmed, 2015; Miihkinen, 2014). Disclosure of corporate risk information is important since it increases transparency, thus giving shareholders more confidence and lowering their uncertainty about future cash flow as well as making it more viable for corporations to obtain external funding at a cost of capital, hence increasing capital market activities in general (Deumes, 2012; Eagly, Monem & Hu, (2016). Institutions are encouraged not only to report their activities but also the risks associated with them as well as their strategy for and capacity to manage these risks (ICAEW, 1999).

Risk disclosure (RD) is the dissemination of any quantitative or qualitative information about uncertainties or risks facing the firm (Oyedokun, & Amafa, 2022; Poova, 2019; Elbannan & Elbannan, 2015). Risk disclosure is the quality of risk information that is disclosed by firms in terms of relative quantity (adjusted by type of sub-industry and firm size), deftness (the potential impact of risk disclosed on the firm's future performance), the coverage within every type of risk, and the outlook profile of firm's risk management. Examples of these risks include financial risks (such as interest rates, exchange rates and liquidity risks); regulatory risks (such as tariff and trade policies, tax policy reforms, minimum wage laws and financial regulations); operational risks (such as customer dissatisfaction or product or service failure); integrity risks (such as illegal acts and earnings management); and strategic risks such as competitors and industry-related risks) (ICAEW, 1997; Poova, 2019). More specifically, Hassan (2014) avers that risk disclosure is the extent and value of information communicated in financial statements dealing with managers' estimates, judgments, reliance on market-based accounting policies such as impairment, derivative hedging, financial instruments and fair value as well as the disclosure of concentrated operations, non-financial information about a firm's plan, recruiting strategy and other operational, economic, political and financial risks.

Ostensibly, several factors within the corporate governance (CG) literature influence the ability of companies to report on non-financial information such as risk in their financial statements. This is because sound CG can protect stakeholders' interests by introducing and strengthening business regulations which enhance accountability, integrity and transparency. Ultimately, this can rationalize the decision-making process as well as mitigate the agency problem between the management and the shareholders. One of the tools used in achieving corporate governance objectives is the board of directors. The Board of Directors is one of the most powerful CG mechanisms to oversee a firm's progress, enhance the quality of disclosure by monitoring and controlling the management's activities and increasing a company's alignment with its stakeholders (Ira & Roth, 2018). This implies the importance of directors in encouraging rather than mandating risk disclosure.

Consistently, research works have found that the effectiveness of CG within RD depends on the composition of the board of directors. In particular, there is a need for diversity within the board to mitigate the complexity of interests involved in the company's CG; as the board of directors is responsible for safeguarding the public interest to guarantee protection to stakeholders and to ensure transparency and compliance with existing laws. Some other studies have argued that greater disclosure by the board of directors signalled a greater ability to manage risk. Thus, the board of directors may use RD to signal their company's good performance and to increase their legitimacy.

One of the attributes of the board that is associated with improved risk disclosure is independence, which is a fundamental quality of outside directors. Literature shows that independent directors may promote corporate disclosure and may, in turn, gain a good reputation as expert monitors (Samaha, Latimer & Conroy, 2015). Indeed, independent directors could reduce the information asymmetry between managers and shareholders by providing more voluntary disclosure (Beasley, 2013). Thus, the appointment of independent directors provides better monitoring of management's behaviour, and is considered a way to control agency problems (Allini, Chizema & Chandren., 2016). Besides, from a resource dependence theory, the non-executive directors are considered as a link between the company and the external environs due to their expertise, prestige and different contacts.

Furthermore, literature has demonstrated that a large board size increases the efficiency of the board and promotes the disclosure of information (Cormier, et al., 2017). According to the agency theory, the larger boards incorporate a variety of expertise and available resources, which results in more effectiveness in the boards' monitoring role (Singh, et al., 2008; Hidalgo & Solberg., 2011). These boards are less likely to be dominated by management, open to the diverse members' opinions and possess the power that may be exerted to supervise managers, which may, in turn, promote corporate disclosure (Samaha et al., 2015). In addition, John and Senbet (2012) argued that a large board size may improve the monitoring role due to greater availability and combined effort. Indeed, a large size of the board will allow a high number of members who have financial and accounting backgrounds, which could affect managers' voluntary disclosure decisions and extend the corporate risk disclosure level (Elzahar & Hussainey, 2016).

Female directors can improve decision-making by providing different perspectives and opinions in the decision-making process. Indeed, gender diversity on the board is an effective driver of business performance and can lead to an enrichment of knowledge (Erhardt, et al. 2016). Compared to male directors, female directors seem to be more active, and they are more likely to attend board meetings and sit on monitoring committees (Adams & Ferreira, 2019). Women are generally more responsive to crises and more likely to engage in giving than men (Williams, 2013). Literature showed that women provide a more collaborative approach to leadership, which contributes to greater communication between managers and the board, as well as stakeholders (Eagly, et al. 2016).

Although extensive literature has examined the impact of boards on disclosure, little has examined the effect of boards on risk disclosure in general and in developing countries in particular. In addition, there is a need for more risk disclosure given the challenges that a company may undergo, to assess its future performance and to ensure the protection of its wealth. Therefore, understanding the determinants of risk disclosure represents relevant information for standard-setters. Besides, there were calls for further research on the effect of the board of directors on risk disclosure (Elzahar & Hussainey, 2016). This study replied to this call for research. It is worth noting that prior research uses the quantity of disclosure as a proxy for disclosure. This study pays more attention to the quality of the disclosure of the industrial goods companies on the Nigerian Exchange Group. the following were formulated and tested

$H_0$1: Board independence has no significant effect on risk disclosure of quoted industrial goods companies on the Nigerian Exchange Group.
$H_0$2: Board size has no significant effect on risk disclosure of quoted industrial goods companies on the Nigerian Exchange Group.
$H_0$3: Board gender diversity has no significant effect on risk disclosure of quoted industrial goods companies on the Nigerian Exchange Group.

Literature Review

Concept of Board Attributes

The phrase "board attributes" is a blend of two concepts: board and characteristics. While the former as stated in Section 334 (1) of the Companies and Allied Matters Act 2020 (as amended), the board of directors (usually referred to as the board) is vested with the duty of hiring managers and administering the activities of the organization. The latter means a typical or noticeable quality of someone or something. Therefore, board attributes can be defined as one internal corporate governance mechanism, which expatiates on the features of the board. The characteristics of the board include size, independence, diligence; diversity (age, gender, nationality, expertise, educational and functional background) and committee structure (Anderson, Ku & Ismail., 2013).

Fundamentally, the administrative activities of the board involve the duty of overseeing and monitoring the organization’s financial reporting process (Anderson et al., 2013). They meet at scheduled times with the organizations' accountant and external auditors to review financial statements, audit procedures and the internal control system (Klein, 2006) targeted at improving the organization's performance. Hermalin and Weisbach (2016) see the board as a market solution that helps mitigate the agency problems that befall most organizations. According to Jenfa (2008), the board is responsible for a company's internal control systems and has the ultimate responsibility for the operation of the company. Boards define the rules for the chief executive officer regarding hiring and firing, compensation plans and provide high-level advice. Ingley (2003) view the board's duty as mainly responsible for monitoring the quality of information contained in financial reports because managers often have their interests and incentives with regard to managing earnings and potentially misleading stockholders.

Board Independence

According to the Code of Corporate Governance for public companies issued by the Nigerian Securities and Exchange Commission (SEC, 2011), an independent director is a non-executive, non-substantial shareholder of the company whose shareholdings, directly or indirectly, do not exceed 0.1% of the company's paid-up capital. In addition, the director must not have been previously employed nor have any business or professional relationship with the company. Allini et al., (2016) defined independent non-executive directors as administrators who should not find themselves in a situation that may affect their independence of judgment or place them in a situation of actual or potential conflict of interest, so they should be independent of management. In addition, others have defined external administrators by excluding internal ones.

Thus, given that inside directors are those who hold a management position in the firm and can then be company executives or employees (Hassan, 2014), the outside directors are the other directors. Literature showed that independent directors may promote corporate disclosure and may, in turn, gain a good reputation as expert monitors (Samaha et al., 2015). Moreover, their presence reduces the likelihood of financial statement fraud (Beasley, 2013). In addition, inside directors are less effective than outside directors and are unable to punish leaders for fear of losing the personal benefits that they can profit from (Jensen & Meckling, 2014). Indeed, independent directors could reduce the information asymmetry between managers and shareholders by providing more voluntary disclosure (Beasley, 2013). Thus, the appointment of independent directors provides better monitoring of management's behaviour, and so is considered a way to control agency problems (Allini et al., 2016). Besides, from a resource dependence theory, non-executive directors are considered a link between the company and the external environs due to their expertise, prestige, and different contacts (Hadigo & Solberg, 2011).

Board Size

Miller, (2019) defined board size as the number of members that form the board. There is no agreed number of members that make up an ideal board size. There have been diverging opinions by various researchers on the number of persons that should make up an ideal board. Some schools of thought are of the opinion that a small board is more effective because it enhances fast decision-making and cannot be manipulated by management. Miller (2019) also argued that a smaller board may be less encumbered with bureaucratic problems, more functional and able to provide better financial reporting oversight.

It is advocated that a relatively small board can take advantage of existing expertise, and avoid sinking in endless discussions to be more effective and responsive in decision-making. Literature shows that large board size increases the efficiency of the board and promotes the disclosure of information (Cormier et al., 2017). According to the agency theory, the larger boards incorporate a variety of expertise and available resources, which results in more effectiveness in the boards' monitoring role (Singh et al., 2008; Hidalgo & Solberg, 2011). These boards are less likely to be dominated by management, open to diverse members' opinions and the power that may exert to supervise managers, which may in turn promote corporate disclosure (Samaha et al., 2015). In addition, John and Senbet (2012) argued that a large board size may improve the monitoring role due to greater availability and combined efforts.

Indeed, a large size of the board will allow a high number of members who have financial and accounting backgrounds, which could affect managers' voluntary disclosure decisions and extend the corporate risk disclosure level (Elzahar & Hussainey, 2016). This is in line with the resource dependency theory, which presumes that a large board has better knowledge and ability to ensure the management of corporate resources (Pfeffer, 2011). However, Elzahar and Hussainey (2016) and Allini et al. (2016) found no impact of board size on risk disclosure, other risk disclosure studies found a positive impact (Adamu, Hassna & Rokiah, 2015).

Board Gender Diversity

Board gender diversity is the proportion of women to men on the board. Evolutionary Biology literature indicates that women are specialized in different tasks as a result of the requirements of nature. As a result, there have been arguments and counter-arguments about women exhibiting important characteristics necessary for good governance. Specifically, it has been argued that women are meticulous, risk-averse, skilled in accounting and finance, and good decision-makers (Adekunle & Asaolu, 2013). Literature shows that the diversity of experience, background, and attitude allows for providing benefits, particularly in corporate governance (Hillman, Shropshire & Cannella., 2017). Female directors can improve decision-making by providing different perspectives and opinions in the decision-making process.

Indeed, gender diversity on the board is an effective driver of business performance and can lead to an enrichment of knowledge (Erthardt et al., 2016). Compared to male directors, female directors seem to be more active, and they are more likely to attend board meetings and sit on monitoring committees (Adams & Ferreira, 2019). Women are generally more responsive to crises and more likely to engage in giving than men (Williams, 2013). Literature showed that women provide a more collaborative approach to leadership, which contributes to greater communication between managers and the board, as well as stakeholders (Eagly et al., 2016). Ntim. , (2015) and Allini et al. (2016) found that the presence of women on the board positively affects risk disclosure. Their results were consistent with the research of Ntim, (2015).

Concept of Risk Disclosure

Risk disclosure is the dissemination of any information that can make the reader able to know about any opportunity or prospect, or of any hazard, danger, harm, threat or exposure, that has already impacted upon the company or may impact upon the company in the future or of the management of any such opportunity, prospect, hazard, harm, threat or exposure (Poova, 2019). Beretta and Bozzolan, (2004,) defined risk disclosures as a communication of information concerning firms' strategies, characteristics, operations, and other external factors that have the potential to affect expected results (Ajibade, Oyedokun, & Onibiyo, 2018). Disclosure of risk is important because it helps stakeholders get the information needed to understand the risk profile and how the management manages risk. Disclosure of risk is also beneficial to monitor risk and detect potential problems so that they can take precautions to prevent the problem from occurring (Poova, 2019). Risk information is also useful for investors because it helps determine the risk profile of the company, reduce the information asymmetry, estimate the market value, and determine the investment decisions of the portfolio (Oyedokun, & Campbell, 2023; Abraham et al, 2015; Hassan, 2014).

Risk Disclosure (RD) has been defined as the communication of information concerning a firm's strategies, operations and other external factors that have the potential to affect its expected results, the disclosure of the firm-specific variances of future cash flows (Ajibade, Oyedokun, & Onibiyo, 2018, Jensen & Meckling, 2014) and the information that describes a firm's major risks and their expected economic impacts on future performance (Miihkinen, 2014; Poova, 2019; Oyedokun, & Campbell, 2023). More specifically, Hassan (2014) implied that RD is a set of information communicated in financial statements dealing with managers' estimates, judgments, reliance on market-based accounting policies such as impairment, derivative hedging, financial instruments, and fair value as well as the disclosure of concentrated operations, non-financial information about a firm's plan, recruiting strategy and other operational, economic, political and financial risks.

In terms of classification, Poova (2019) indicated that RD can be divided into Mandatory Risk Disclosure (MRD), which refers to the information that is required by the accounting and business regulations and Voluntary Risk Disclosure (VRD), which refers to the information that provides additional explanation beyond the minimum requirements specified within RD-related regulations and accounting standards. In this regard, Miller (2019) argued that companies offer VRD to information users to increase their global competitiveness.

Empirical Review

Munturi (2019) examines the relationships between corporate governance variables and the extent of risk disclosures among listed companies in Kenya. The study aims to empirically examine the relationship between corporate governance variables and risk disclosures in 48 listed non-financial companies in Kenya. Content analysis of annual reports for the period 2010-2016 was used to measure the level of risk disclosures and compute the risk disclosure index for each company studied. The relationships between variables were analyzed using panel data analysis. The findings show that the percentage of non-executive directors, ownership dispersion, percentage of foreign ownership, and women on boards affected significantly the level of risk disclosures in the studied companies. This presents a timing difference as well as a problem of external validity.

Kaifah, et al. (2019) examines the relationship between corporate governance characteristics and risk disclosure practice. The corporate governance characteristics examined include board independence, the board size, board gender and auditor independence, including auditor tenure. A total of 721 companies were analyzed based on the Bursa Malaysia list from 2008 to 2017. To determine the level of risk disclosure, this study employed content analysis. Descriptive statistics and multiple regressions were used in this study to examine this relationship. The study found that there is a positive relationship between multi-gender boards and risk disclosure practices in Malaysian listed companies. The study finds that there is a positive relationship between a higher proportion of independent directors on board and risk disclosure practice in Malaysian listed companies. This current study focuses on risk disclosure in the Nigerian Industrial goods sector.

Alshaer and Zaman, (2018) explore the impact of Corporate Governance (CG) attributes on risk disclosure for a sample of Jordanian listed firms. The study employed two types of disclosure (voluntary and mandatory) and analyzed the firms' annual reports for the period of 2008-2015 to extract risk-related disclosure information and CG variables. The final sample of the current study consists of all listed Jordanian banks (15 banks) from 2008 to 2015. The study utilizes the Ordinary Least Squares (OLS) regression to carry out the current investigation. The findings indicate that CG attributes (including board size and independent board (non-executive directors), the separation of duties and audit committee meetings) have a statistically positive impact on Voluntary Risk Disclosure (VRD), while this was not the case with the managerial ownership attribute. Further, the results reveal that independent directors have had a significantly positive influence on Mandatory Risk Disclosure (MRD), and audit committee size has had a positive significant effect on MRD. The results suggest that firms' managers, who exhibit greater compliance with mandatory regulations, have a greater propensity to publish RD. The study was conducted in the banking sector while the current will be on manufacturing firms. More there is also, a problem of external validity.

Alini and Allini (2016) examines the potential impact of the composition of the board of directors and company-specific features on risk disclosure levels. The present research focuses on Italy where the State has had a strong presence amongst listed companies for several decades. This study analyses the risk disclosure of companies listed on the Italian Stock Exchange (ISE) for the financial years 2008-2011. The aggregated variables examined include board diversity and board characteristics. To test the hypotheses, the study ran an ordinary least square (OLS) regression with robust standard errors on the basis of cross-sectional analysis. The main findings suggest that of all the variables, only board diversity significantly affects risk disclosure by SOEs. Board diversity is also considered in the current, which focuses is on the Nigerian industrial goods sector.

Theoretical Framework

The Upper Echelon Theory

In the pioneering work by Hambrick and Mason (2014), the two concepts of the dominant coalition and demographic research were combined. The authors suggested that certain organizational effects are linked to top management teams with specific demographic profiles. Moreover, upper echelons theory proposes that the characteristics of top management, particularly demographic characteristics, might affect strategic decision-making and hence performance. At the centre of this theory is the notion that the background knowledge and values of corporate directors impact the essential strategic decisions made by these central corporate managers. Hambrick and Mason (2014) also claimed that observable attributes, such as, age, practical experience and tenure could function as practical proxies for the cognitive base that directs top directors' decisions. Moreover, upper echelons theory is categorized according to several important elements. As highlighted by Hambrick and Mason (2014), demographic features influence strategic decision-making and performance. Thus, in this study, the concept is extended to the determinants of risk disclosure, investigating whether such features of the top board could impact the determinants of risk reportage in the industrial goods companies quoted on the Nigerian Exchange Group.

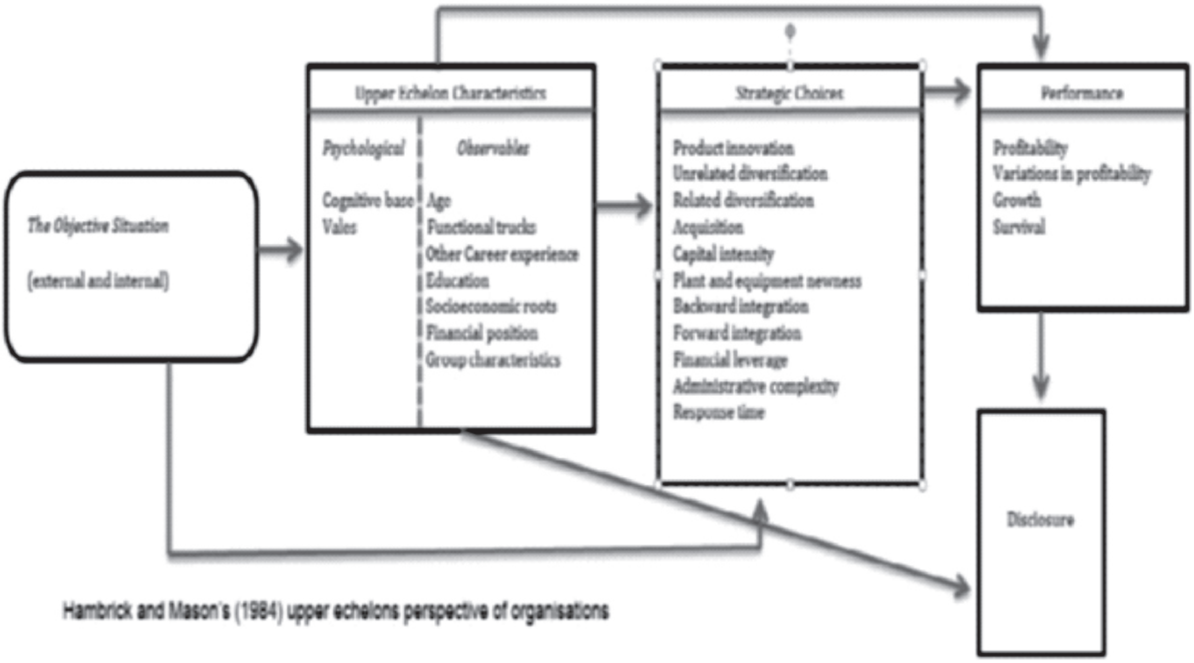

Figure 1: Upper Echelons Framework

Figure 1; presents the adapted upper echelons framework, which is based on three fundamental principles: first, the strategic choices taken by institutions (the representations of the cognitive bases and values of the dominant players, the top board members); second, the cognitive bases and values of such players (the ramifications of their observable characteristics, such as functional trucks and education); and third, the significant institutional consequences that are related to the observable characteristics of such players. This theory proposes that institutional performance is only a representation of its top board directors. However, the fourth dimension (disclosure) added to the above framework can be directly influenced by upper echelons theory characteristics or indirectly by the ramifications of the overall performance of the company, where sometimes risk disclosure would mean survival for an institution. This model also plays a vital part in determining key institutional effects such as the provision of risk disclosure. It also grants us the opportunity to investigate the core determinants of board demography in relation to risk disclosure. This theory implies that certain organizational effects are linked to top management teams having specific demographic profiles.

Moreover, upper echelons theory proposes that the characteristics of top management, particularly demographic characteristics, might affect strategic decision-making and hence performance. At the centre of this theory is the notion that the background knowledge and values of corporate directors impact the essential strategic decisions made by these central corporate managers. Moreover, this theory incorporates several important elements such as demographic features, strategic decision making and performance. Thus, in this study, the concept is extended to the determinants of risk disclosure, investigating whether such features of the top board could impact upon the determinants of risk reportage in the industrial goods sector. Such demographic traits play an important role in determining key institutional effects, such as the provision of risk disclosure in the annual reports. This theory will also assist this investigation in interpreting the findings of the current study's second question to identify what determines risk information in the annual reports. This theory will also be employed to reinforce the results of the second research question. It also grants this study the opportunity to investigate the core determinants of board demography in relation to risk disclosure.

This theory has primarily been used in fields other than disclosure. For example, Faleye, Hoitash & Hoitash (2011) deployed upper echelons theory to examine the determinants of organizational performance. Carter, Simkins & Simpson, (2003) used it to explore the effects of firm international diversification, and Mutuku et al. (2012) employed it to study the quality of decisions and performance.

Methodology

This study adopts an *ex post facto* research design. The population of the study consists of 13 industrial goods companies quoted on the Nigerian Exchange Group (NGX) as of 31st December, 2024. Since the population is small and data is readily available for all companies, the study considered all the companies for data collection. Data were extracted from the published audited annual reports and accounts of the listed industrial goods companies in Nigeria from 2011-2024. Annual financial statements were chosen for data collection based on the type of data to be collected, availability of data to be collected and the ease of results comparability.

The study employs multiple regression as the technique for analysis with the aid of STATA version 16. The data for the study is panel in nature and to check for endogeneity, the study used the Hausman specification test. Additional diagnostics tests adopted in this study include the test for Multicollinearity using the Variance Inflation Factor (VIF) and the Breutsch-Pagan test for heteroscedasticity, to check for the fitness of the model and reliability of findings. The study uses board independence, size and gender diversity as predictor variables and risk disclosure as the outcome variable. The individual model is presented below in line with Alkabas (2016) with slight modifications. To test the study hypotheses, the study estimates the following multiple regression model:

$RD = f(BIND, BZ, BGD)$ - - - - -(1)

However, the model is econometrically stated as:

$RD = \alpha + \beta_1 BIND_{it} + \beta_2 BZ_{it} + \beta_3 BGD_{it} + \mu_{it}$ ....(2)

Where:

RD = Risk Disclosure, BIND = Board Independence, BZ= Board Size, BGD= Board Gender Diversity, α= constant, it = firm *i* in time *t*, μ = error term, β_1 - β_3= coefficients

Table 1: Variables Measurement

Variables	Type	Measurement	Source
Risk Disclosure	Dependent	measured by Dichotomous "1" if a company discloses risk in the financial statement otherwise "0"	Alini and Allini (2016); Ashfaq, Zhang, Munaim and Razzaq (2016)
Board Size	Independent	Total Number of Members on the Board	Muturi (2019); Carmona, Fuentes and Ruiz (2016)
Board Independence	Independent	proportion of independent non-executive directors to the total number of directors	Ibrahim, Habbash and Hussainey (2019)
Board Gender Diversity	Independent	The proportion of female executive and non-executive directors on the board to the total board size.	McIntyre (2007)

Source: Authors' Compilation, 2024

Results and Discussions

Descriptive Statistics

This section contains a description of the properties of the variables ranging from the mean of each variable to minimum, maximum and standard deviation. The summary of the descriptive statistics of the variables is presented in Table 1.

Table 2: Descriptive Statistics

Variables	OBS	Mean	SD	Min	Max
RD	130	0.4834	0.1265	0	1
BIND	130	0.1864	0.1772	0.0675	0.6355
BZ	130	8.00649	3.019537	6	14
BGD	130	.1006515	.0644009	0.00	.285714

Source: STATA Output, 2024

The mean value of the dependent variable of the study, risk disclosure (RD) is 0.4834 with a range of 0 and 1. Based on these figures, it is evident that there are large variations in the volume of risk disclosures of industrial goods companies in their annual reports. With regard to the independent variables, Table 2 shows that the mean value of board independence ranges from a minimum of 0.0675 to a maximum of 0.6355 with a mean of 0.1864 and a standard of 0.1772. The result clearly shows a wide variation in the presence of external directors on the board. Also, the descriptive statistics show values of board size to have a range of 6 and 14. This indicates a relatively wide variation in the number of the board of directors in the industrial goods sector. This is substantiated by the value of the mean which stands at 8 and the SD which is 3. On the other hand, the proportion of female directors to the total number of directors on the board of the sampled firms varies between 0.00 to 28.57%, with an average of 10%. This finding indicates that the sampled firms have a majority of male directors on their boards and that a majority of firms do not have female members on their boards.

Correlation Matrix

The Pearson correlation analysis matrix shows the relationships between the explanatory and the explained variable and also the relationship among all pairs of independent variables themselves. This section shows that there is a correlation between the dependent variable risk disclosure and independent variables board independence, Board size and board gender diversity as well as control variables firm size.

Table 3: Correlation Matrix

	RD	BIND	BZ	BGD
RD	1.0000			
BIND	0.486	1.0000		
BZ	0.210	-0.238	1.0000	
BGD	0.068	-0,001	0.109	1.000

Source: STATA 16 Outputs, 2024

Table 3 presents the correlation matrix for the variables used in the study. The results of the Pearson correlation analysis indicate that the extent of risk disclosure is positively correlated to board independence, with a correlation coefficient of 0.486, contrary to the first hypothesis of the study. Accordingly, the results also show that the other independent variables board size and board gender diversity are statistically correlated to the extent of risk disclosure, at variance with the hypotheses.

Table 4: Summary of Logistics Regression Result

FRT	Coefficient	Z	p-value
BIND	-1.0221	-2.87	0.004
BGD	3.1500	10.25	0.000
BZ	12.1366	7.55	0.000
Pseudo R^2	0.5966		
LR Chi^2	903.82		
Prob > F	0.0000		

Source: STATA 16 Output, 2024

The logistic regression result Table 4 indicates that the aggregate influence of the explanatory variables included in the model can explain risk disclosure up to about 59% as indicated by the Pseudo R^2 while the remaining 41% are accounted for by other board factors that are not included in the model. The F-Statistics value of 903.82, which is significant at 5% shows that the model is fit and therefore provides substantial evidence that board attributes have a significant effect on risk disclosure of quoted industrial goods companies in the Nigerian Exchange Group.

Given the individual explanatory variables, the summary of the result in Table 3 shows that board independence has a significant effect on risk disclosure of quoted industrial goods companies in Nigeria. This claim is substantiated by the p-value which is 0.004 and significant at a 5% level of confidence. Hence, the study rejects the hypothesis board independence has no significant effect on risk disclosure of quoted industrial goods companies in the Nigerian Exchange Group.

The study also looked at the extent to which board gender diversity can influence the risk disclosure levels of quoted industrial goods companies listed on the Nigerian Exchange Group. The output in Table 3 showed that a positive and significant relationship exists between board gender diversity and risk disclosure of quoted industrial goods companies in the Nigerian Exchange Group. This is evidenced by the value of coefficient and probability which stands at 3.1500 and 0.000 respectively. This shows that the board composed of both males and females can determine highly the extent of risk disclosure. Based on this the study rejects the hypothesis which states that gender diversity has no significant effect on risk disclosure of quoted industrial goods companies in the Nigerian Exchange Group.

The relationship between board size and risk disclosure was also investigated and the result from table 3 clearly showed that board size has a positive influence on risk disclosure of quoted industrial goods companies in the Nigerian Exchange Group. The evidence from the result showed a coefficient of 12.1366 and a p-value of 0.000 indicating a statistically significant relationship. Hence, the study fails to align with the hypothesis that board size has no significant effect on risk disclosure of quoted industrial goods companies in the Nigerian Exchange Group.

Conclusion and Recommendations

As noted by previous studies, corporate governance codes have recognized the need to improve corporate risk disclosure and provide guidance for such disclosures. Understanding the drivers for firms to disclose risk-related information may assist regulators and standards setters in promoting both the spread and the improvement of such disclosures through the issuance of corporate governance codes and reporting. This study responds to recent calls for more research on this subject by empirically examining the effect of selected board attributes on risk disclosure of industrial goods firms quoted on the Nigerian Exchange Group from 2013 to 2024. The dependent variable of the study, risk disclosure, is measured by dichotomous "1" if a company discloses risk in the financial statement it is otherwise; "0". On the other hand, in the light of previous literature, three board attributes are considered as those independent variables that may have a relationship with the extent of risk disclosures of companies, namely, board independence, board size and board gender diversity.

The findings of the study reveal that board independence has a statistically significant and positive effect on the extent of risk disclosure, hence only the first hypothesis of the study is rejected. This finding supports the assertion that outside directors have incentives and the capability of improving the information quality of financial reports by insisting on improved disclosure of voluntary non-financial information. This is because external directors have a unique understanding and knowledge of outside markets' strategies that a firm wants. Thus, such knowledge may contribute additional value to the intended expansion of the company.

The study concludes that board size has a significant influence on risk disclosure of quoted industrial goods companies listed on the Nigerian Exchange Group. This conclusion may hold because a larger board size encourages further oversight, provides businesses with the variety that assists them deliver essential resources and reduce ecological risks, alleviates the CEO's dominance and improves the pool of knowledge that derives from the board's diversity.

Furthermore, the study concludes that board gender diversity is associated with the extent of voluntary risk disclosure. Boards are concerned with having the right composition to provide diverse perspectives as greater female representation on boards provides some additional skills and perspectives that may not be possible with all-male boards.

Arising from the conclusion, that study recommends that; Risk arguably will continue to exist in a volatile business environment and an effective mitigation tool may come in handy to improve transparency and reduce information asymmetry. Therefore, the level of disclosure in both qualitative and quantitative terms is encouraged. Also, this study recommends that the Nigerian industrial goods sector be composed of boards with diversities such as gender, expertise, and nationality especially the independent directors who can bring their experiences to bear in making decisions with respect to risk information disclosures.

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