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Interaction Effect of Board Attributes on the Relationship between Environmental Disclosure and Market Value: Evidence from Listed Manufacturing Firms in Nigeria

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Abstract

The study assessed the interacting effect of board attributes on the relationship between environmental disclosure and market value. The study used secondary data from the published annual reports and accounts of selected quoted manufacturing companies in Nigeria. Forty-five (45) manufacturing companies quoted on the Nigerian Exchange Group (NGX) for ten (10) years covering the period 2013-2022 were adopted as sample, regression techniques were used to carry out data analysis. The result indicated that there is a negative and insignificant relationship between environmental disclosure and market value and further revealed that board attributes significantly moderates the relationship between environmental disclosure and market value of the selected manufacturing companies listed on the NGX. The study recommends that a more diverse board with an understanding of the markets will promote creativity, decision-making, innovativeness, enhanced evaluation of additional alternatives that will boosted market value.

Keywords: Board Composition, Environmental Disclosure, Market Value Performance, Tobin's Q, Manufacturing Firms, Nigeria.

1. Introduction

Financing options made by companies have produced significant interest from both scholars and practitioners as a result of their effect on capital structure, dividend policies, and capital budgeting decisions (Sani, Abubakar & Muhammad 2024). Fundamentally, corporate performance is the practice of determining the outputs of a company in terms of their operations. It shows the level of performance of an economic unit over a given period of time and is usually quantified in terms of total profit and loss. Businesses usually measure their performance at regular interval, mostly at year end, to assess the level to which their financial objective has been met (Ogunsola 2023). Liargovas and Skandalis (2008), stated that there are several views regarding how the performance of firms should be measured and the factors that affect such corporate performance. Essentially, they are three dimensions associated with the evaluation of firm's performance. Firm's productivity which is the first dimension has to do with the efficiency of processing inputs into outputs. Whereas the second dimension known as profitability dimension evaluates the proportion of firm's earnings as it relates to costs incurred by the firm within a given period. Also, the third dimension, market premium has to do with the level at which a firm's market value exceeds its book value (Walker, 2001). Profitability measure indicator is quite an essential performance indicator because it explains the various levels of performance of firms as it can be used as a single surrogate performance indicator. Other measures of financial performance are market value performance measures by price per share to earnings per share, market value to book value of equity and Tobin's Q.

In this research work, the market value performance is considered. Market value has to do with the amount of value and paybacks derived from the shares of a firm by the shareholders. Market value performance tool measures the expected long-run firm performance and ascertains whether a company's aggregate market is relatively over or undervalued. Market value shows the company's value in line with stock market and the value is to equal market capitalization. Tobin's Q as a market performance indicator shows the relationship between a physical asset's market and its replacement value. Market base performance tool measures the expected long-run firm performance and ascertain whether a company's aggregate market is relatively over or undervalued.

In the views of Ajibolade and Uwuigbe (2013), environmental disclosure has to do with reporting environmental policies, process, impacts, audits, environmental issues associated expenditures, the environment advantages of products, and important points as they relate company's operational activities which leads to profit. Similarly, Lodhia (2006) posited that environmental disclosure has to do with the reporting process in which companies disclose their environmental information in the annual reports and accounts with the view of communicating their financial position to the various stakeholders with the aim of giving out an adequate evidence of stewardship. The forgoing positions highlighted the responsibility of the company's decision makers to make choices that are anchored on the fact that there is a relationship between the firm and the society, consequent upon this, it is quite essential for companies to continue its commitment of ensuring ethical practices and make contributions to environmental sustainability with a clear motive for profit making. Environmental disclosure is beneficial to firms because it reveals the social and ecological values of the firms, hence reducing the tremendous pressure from environmentalists, pressure group as well as promote firms corporate image (Gwar, Angahar & Iorpev 2024).

Corporate board refers to as one of the corporate governance structures formed to operate and direct the strategic affairs of an organization with the aim of safeguarding the interests of the shareholders and other stakeholders. The board as a physical regulating team meets at frequent intervals to setup plans for corporate control as well as management of the organization generally. According to Ahern and Dittmar (2010), a board is body of strategic decision-making and the highest managerial organ within an organization proposed to exploit organization firm value. In the views of Omoye and Eriki (2013), board is a body with different influences that serves as a moderator, and as a performer, determining the regulations of the strategic activities of the organizations. The primary duty of the board is to advance or project a direction for the firm in a positive manner that will ensure quality decision making for a continuous benefit of the investors of the firms.

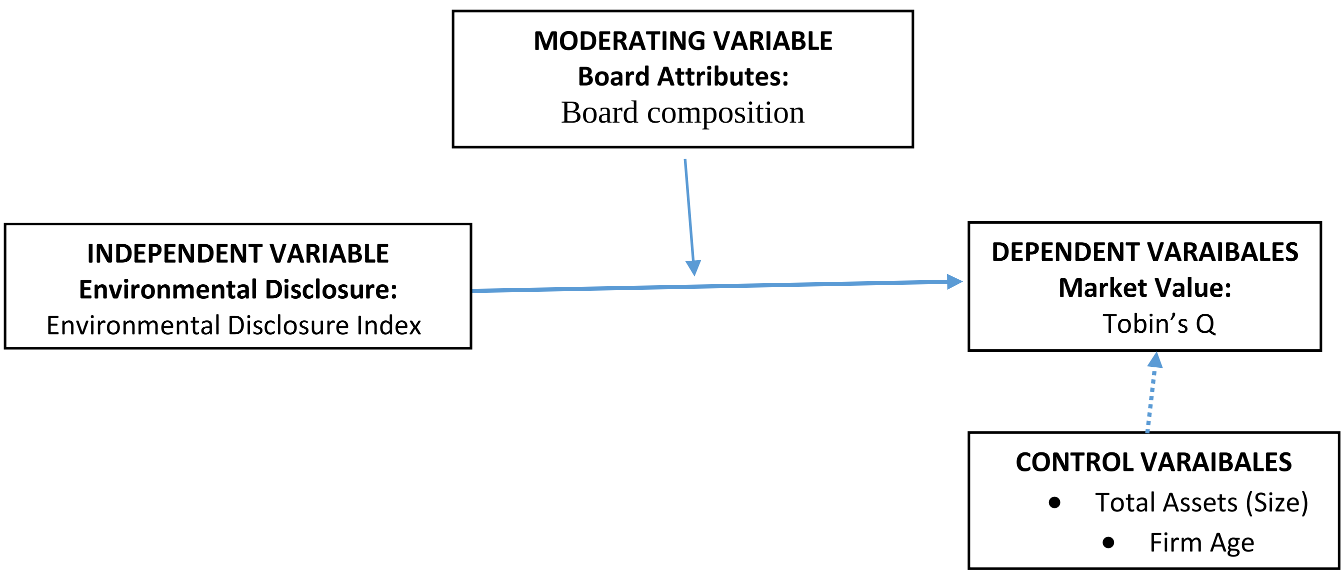
Board attributes is a subset of corporate governance, it's a branch of Corporate Governance that deals with the size, composition, diversity and other attributes of the board. Apparently, board attributes are essential tools in a corporate governance mechanism platform. According to Horvath and Spirollari (2012), board attributes are a core component in corporate governance. According to Thakolwiro and Sithipolvanichgul (2021), board attributes are features of board of directors such as the size, the ages of directors in board, the race of the board members, executive directors and non-executive directors' mix, the gender mix of the board, the length of experience in years. In this study, board composition has been used as a proxy for board attributes. This is because it comprises of more non-executive directors or a board with more executive directors will determine whether their diverse experience, expertise and professionalism (Accountants, Engineers, Managers, Architects, and Doctors) will influence the relationship between environmental disclosure and market value performance.

Despite the numerous research work carried out on the relationship between environmental disclosure and market value performance, yet the influence of board composition on how environmental disclosure affects Tobin's Q remains unclear. Whereas the interaction between board composition and environmental disclosure on market value (Tobin's Q) is under-researched. Also, existing research works often focused on developed economies (Xi et al 2022; Tuhin et al 2021 and Digdowiseiso et al 2020), hence offering limited picture into the Nigeria situation where board structures of business practices may vary significantly (Gwar, et al, 2024).

The objective of the this study is to ascertain the interaction effect of board attributes (board composition) on the relationship between environmental disclosure and market value of listed manufacturing firms in Nigeria will address the above forgoing stated knowledge gaps associated with previous research works like that of Obiora et al (2022), Egbunike and Ogochukwu (2018) and Erinoso and Oyedokun (2022).

2. Literature Review and Hypotheses Development

Conceptual Framework



Theoretical Framework

The signalling theory links the interaction effect of board attributes on the relationship between environmental disclosure and market based performance of manufacturing firms in Nigeria. The theory was propounded in 1973 by Michael Spence and it form signal models in the work environment between employer and the employees' relations (Amosh & Saleh, 2022). The theory addresses concept within the fields of economics and organizational practices and with emphases on the relevance in situations where information lop-sidedness exists between two parties (sender and receiver). According Bae, Masud and Kim (2018), signalling theory posited that management shares information to send signals to the market and stakeholders to reveal their assurance to voluntary activities, which decreases information asymmetry and improves the firm's reputation. Signalling theory is essential to understanding the environmental disclosure-performance connection, as it recommends that firms use environmental disclosures as signals to send their underlying quality and commitment to stakeholders, thus enhancing the potentials firm value performance and market. In view of the position of the foregoing theory, it can be posited that the theory has a link that show the importance of board attributes on sustainable growth and robust market base performance due to its supportive disposition on environmental disclosure activities.

Empirical Studies

Numerous studies have been conducted so as to ascertain the effect of environmental disclosure and market base performance (Tobin's Q). The various studies as conducted indicated a mix results (Nimanthi & Priyadarshanie 2021 and Egbunike & Ogochukwu., 2018). Suttipun et al (2023) investigates the impact of environmental reporting on firm performance of listed companies from high environmental impact industries in Thailand. The study was for five (5) years covering a period of 2016 to 2020, a survey of one hundred and sixty-three (163) listed companies of the high environmental impact industries from the Stock Exchange of Thailand (SET). The results indicated that environmental reporting (environmental disclosure index) has a negative relationship with firm performance (return on assets and Tobin's Q) of high environmental impact industries in Thailand.

Iyoha and Igbinovia (2023) examines environmental information disclosures and value of agro-manufacturing firms in Nigeria. The study collected data from twenty (20) firms listed in the Nigerian Exchange Group and secondary source of data were collected for five (5) years ranging from 2012 to 2016. The results of the study indicated that material recycling and conservation resources disclosure indicate a positive significant effect on firm value of Agro-Manufacturing firms in Nigeria.

Olagunju and Ajiboye (2022) examined environmental accounting disclosure and market value of listed non-financial firms in Nigeria. The research was conducted covering a period of nine (9) years ranging from 2012 to 2020 and made use of a sample of seventy-two (72) listed non-financial firms on the Nigerian Stock Exchange. The results empirically obtained revealed that environmental accounting disclosure have a positive and significant relationship with market value (EPS) of listed non-financial firms in Nigeria.

Nimanthi and Priyadarshanie (2021) examined environmental disclosure practices and firm performance; evidence from Sri Lanka. The study covers a period of four (4) years ranging from 2015 to 2018 and made use of a sample of fifty (50) listed companies in the Colombo Stock Exchange (CSE). The results indicated that there is negative relationship between environmental disclosures and EPS.

Nguyena and Manh (2019) investigates the disclosure levels of environmental accounting information and financial performance: The case of Vietnam. The study period is for five (5) years covering from 2013 to 2017. The study which has a sample population of one hundred and five (105) listed firms in Vietnam. The results indicated a positive relationship between disclosure of environmental accounting information and financial performance (Tobin's Q) on firms listed in Vietnam

Akinlo and Iredele (2014) examines the relationship between corporate environmental disclosures and market value of quoted companies in Nigeria. The research work is for nine (9) years period ranging from 2003 to 2011. The study which sample size is for ninety (90) quoted companies in Nigeria. The result findings showed that corporate environmental disclosure has both positive and negative effect on Market Value (Tobin's Q).

The signalling theory used give out too much signal and this can lead to a chaos of signals, making it hard for receivers to differentiate genuine signals from sound. It is observed that majority of the studies reviewed used few and scanty variables in conducting their studies so as to arrived at their various results.

3. Methodology

The study used secondary data collected through the use of content analysis of published annual reports and accounts of the selected listed manufacturing on Nigerian Exchange Group (NGX). Forty-Five (45) manufacturing firms listed on NGX are selected for this study as at 31st December, 2022. The period of ten (10) years ranging from 2013 – 2022 is used through content analysis of published annual reports and accounts. The research work carried out analysis with the use of descriptive statistics and regression analysis tools.

Model specification

This model takes into account the moderating variable feature and is stated as:

$TO_{it} = f(ED)$ 1
$TQ = \beta_{it} + \beta_1 ED_{it} + \beta_2 BC_{it} + \beta_5 FS_i + \beta_4 FA_{it} + \mathcal{E}i$ 2
$TQ = \beta_{it} + \beta_1 ED_{it} * \beta_2 BC_{it} + \beta_5 FS_i + \beta_6 FA_{it} + \mathcal{E}i$ 3

Where;
TQ = Tobin's Q
ED = Environmental Disclosure
BC = Board Composition
FS = Firm Size
FA = Firm Age
β1 β2… β6 = Regression Coefficient
i = No of firms
t = Time Period
Ɛ = Disturbance or Error term
* = Interaction between the dependent and the moderating variable

Table 1: Variables Definition and Measurement

Variables	Acronym	Variable Denotations	Measurement	Source
Board Composition	BC	Moderating	Number of non-executive directors/Total number of directors	Ilaboya and Obaretin (2015)
Environmental Disclosure	END	Independent	Scores '1', if disclosed and '0' when not disclosed	Ullah (2013)
Tobin's Q	TQ	Dependent	Market capitalization + Total debt) / Total asset.	Iyoha and Igbinovia (2023)
Firm Size	TA	Control	The natural log of total Assets	Asthana (2014)
Firm Age	FA	Control	Number of years from the year of listing on the NGX	Aburime (2008)

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4. Results and Discussion

Descriptive Statistics

Table 4.1 Result of the Descriptive Statistics

Variables	Obs	Mean	Std Dev	Min	Max
ED	450	0.4038	.27474	0.10	.90
BC	450	71.67	13.45	38.46	93.33
ED*BC	450	28.86	20.65	0.71	83.08
SIZE	450	8.66228	9.26371	5.30957	11.18124
AGE	450	43.99	20.34	5	79
TQ	450	1.988	1.78	0.18	9.93

Source: Researcher's Compilation from STATA Output, 2024.

Table 1 indicates the descriptive features of the variables. It shows that environmental disclosure index has a mean of 0.4038 and a standard deviation of 0.2747. Indicating that on the average, most of the sampled companies report their environmental issues amounting to 40.38%. With a maximum value of 0.90, it suggests that some companies report up to 90% on their environmental issues whereas the least report about 10% which is the minimum disclosure index.

The moderating term, board composition has a mean of 71.67%. This implies that on the average, the sampled companies have a board composition that is 71.67% independent/non-executive directors on the board of directors. The highest company shows a maximum board composition value of 93.33% while the least has a value of 38.46%. This shows that most of the sampled companies have boards that can actually play their oversight function over the affairs of the operations of their companies in an objective manner that may lead to better monitoring and supervision, culminating to better performance. For the moderating variable – board size and environmental disclosure, a mean of 58.86 shows that board size has 28.86 effect on environmental disclosure's ability to affect financial performance. This entails that board size is a governance mechanism that can influence environmental disclosure of companies. The minimum values of 0.71 and 83.08 with a standard deviation of 20.65 indicating that there are no wide fluctuations in the data set.

The Tobin's Q ratio shows a mean of 1.988 and indicates the capacity of the sampled companies to undertake investments on the environment. However, for individual companies where Tobin's Q ratios show a value of less than 1, this indicates their difficulty in carrying out these investments as that will amount to mere waste of shareholders' money (Friedman, 1974). This implies that the sampled companies are in good standing to initiate sustainable development practices that will portray them as good corporate citizens since their high TQ value supports their ability to invest in issues outside their immediate economic benefits.

Regression Result for Models

The results here provide information as to the strength and direction of the relationship between the environmental disclosure, board composition and the market value performance variable (Tobin's Q) used in this study.

Table 2 Environmental Disclosure, Board Composition and TQ

Number of Obs	450			
Prob	0.000			
R -squared	0.937			
TQ	**Coefficients**	**Std Error**	**t**	**p- value**
Constant	0.357	0.099	3.60	0.000
ED	-0.059	0.059	-1.00	0.317
ED*BC	0.854	0.060	14.29	0.000
SIZE	0.026	0.008	3.32	0.001
Age	0.104	0.072	1.43	0.152

Source: Researcher's Compilation from STATA Output, 2024**.**

Table 2 shows that environmental disclosure index accounts for only 93.65% of variations in TQ while 6.35% is accounted by factors outside this study. This means that environmental disclosure has accounted for most of the variations in TQ and so it is a major determinant of market performance. This deviates from most of the prior studies in this area that reported low to no explanatory power of environmental disclosure and their effect on company performance.

The table also shows that an increase in environmental disclosure by one unit will deteriorate TQ by 5.9%. This implies that environmental disclosure has the potentials of influencing market performance of the sampled firms negatively. As a major sustainability variable, its negative effect shows that the sampled companies have not been carrying out possible environmental protection activities and were not disclosing them properly as they should preparatory to the acknowledgement of market stakeholders. This has the potentials of not only making their environment unsafe for business operations but will go a long way in destroying the safety needs of both their employees, the marketing environment and the society as a whole.

When board composition (BC) moderates environmental disclosure, TQ will increase by 85.4%. This helps in strengthening the research agenda that board composition is a powerful weapon that companies should adopt in enhancing their environmental disclosure requirements that can help them remain afloat since the negative effect has drastically reduced to a huge positive value. As indicated by the statistics, a stand-alone environmental disclosure index was highly negatively affecting TQ but when moderated by BC, it is now largely positive. This also implies that when companies ensure that the non-executive or outside/independent directors dominate the board, their disclosure on the key environmental issues will improve their market performance which would be appreciated and rewarded for doing good. For the control variables, a unit increase in SIZE will significantly enhance ROE by 2.6%. This suggests that bigger companies need to undertake investment in environmental innovations as this will improve their market performance. The statistical result here has confirmed the study expectation that the bigger the size of the company the more its readiness to spend on other issues. This result has also shown that bigger companies desire to behave socially good in the Nigerian environment as is supposed to be elsewhere.

More so, a unit increase in age will insignificantly increase TQ by 10.4%. It is expected that, managers of older companies may be financially disposed by virtue of their long term existence and corporate will and may be willing to invest outside those activities that may have direct and immediate benefit to them as expected on the market. Statistically, it is shown here that the older companies grow the more when they spend on innovative practices and development towards improving their market participation and hence be rewarded by market players. This goes with the study's expectation that age will be positively related to environmental disclosure.

5. Conclusion and Recommendations

Conclusively, the results showed a negative and insignificant relationship between environmental disclosure and Tobin's Q. The result shows that p-value of environmental disclosure is greater than 0.05 (0.317). Thus, the null hypothesis is accepted that environmental disclosure has insignificant affect TQ of the listed manufacturing companies in Nigeria. However, when board composition moderates the relationship of environmental disclosure and Tobin's Q, it affects the relationship positively. This revealed that, the p-value of environmental disclosure when moderated by board composition are all less than 0.05 (0.000). The conclusion is substantive especially where board composition moderates the relation of EDI and Tobin's Q.

Several environmental disclosure approaches should be put in place so that it can assist companies present more convincing and appropriate information to the market. Actually, a more varied board of directors enhances good understanding of markets that are differentiated in terms of increasing creativity, decision-making, innovativeness, enhanced evaluation of additional alternatives that will enhanced market value. That varied board of directors with an understanding of the markets will promote creativity, decision-making, innovativeness, enhanced evaluation of additional alternatives that boosted market value.

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