Jurnal Administrasi Bisnis
Volume 13, Issue 2, September 2024 pp. 165-176
P-ISSN: 2252-3294 E-ISSN: 2548-4923

Sectoral Analysis of Corporate Environmental Disclosure of Listed Manufacturing Companies in Nigeria

Muhammed Kamaldeen Usman
Department of Accounting and Finance, Kwara State University, Malete, Nigeria
Email: usmankamal22@gmail.com

Abstract: *Corporate reporting practice seems to be treated towards activities that bordered investors' interest with little or no information emphasizing on their impacts on the environment. Despite the harmful effects, such as pollution, resulting from the operations of these companies, there appears to be a reluctance to disclose detailed information about the extent of their environmental impact. This study offers empirical evidence through a sectoral analysis of corporate environmental reporting among listed manufacturing companies. It adopts an ex-post facto research design, examining a population of seventy-six (76) listed manufacturing companies across seven (7) sectors. Descriptive and inferential statistics were employed in the analysis of data collected through content analysis from the annual reports of the companies for a period of five (5) years (2018-2022). The results revealed sectoral differences in environmental disclosure, with the Oil and Gas sector leading in overall environmental reporting, especially regarding environmental policies. The Consumer Goods sector disclosed the most information on product and process-related environmental issues, highlighting the negative impacts of manufacturing. The study concludes that significant variations exist in corporate environmental reporting among sectors and recommends a standardized template for environmental disclosure to ensure uniformity among listed firms in Nigeria.*

Keywords: *Corporate Environmental Disclosure; Sectoral Analysis; Manufacturing Companies; Environmental Policies; Product and Process*

Introduction

In contemporary times, shareholders are not merely concerned about a company's financial performance; they are also deeply interested in its social, environmental, and human resources performance (Usman, 2019). It's widely recognized that a firm's success is not solely measured by its financial profits; it also hinges on how effectively it fulfills its obligations to the environment and society. Profit represents just one facet within the broader performance landscape. Recent shifts, like the transition from a shareholder-centric approach to a stakeholder-centric one, alongside an increasing societal awareness of the vital role played by natural and environmental resources, have heightened the call for enhanced transparency in communicating the effects of organizational activities on these resources.

Concerns arising from resource depletion, environmental degradation, and social inequalities have fueled a growing demand for a more sustainable society and economy (Kazemi et al., 2023; Else et al., 2022; Gu & Wang, 2022; Higgins et al., 2020). Consequently, companies worldwide are now sharing their endeavors aimed at striking a sustainable equilibrium with their surroundings, ensuring that their operations don't jeopardize the future of the environments in which they operate. Critics have argued that corporate reporting practices have traditionally fallen short in addressing matters of interest to investors, providing scant or no information regarding their environmental impacts. Yet, the contemporary challenges of our era, notably climate change, global warming, natural disasters, and pollution, are predominantly fueled by the activities and operations of companies on a global scale.

However, it's worth noting that Nigeria has been comparatively slow in responding to the escalating concerns about the environmental aspects of corporate activities. This is despite the fact that many Nigerian companies, particularly in the manufacturing sector, have a substantial impact on the environment, often through activities like pollution emissions (Usman, 2024). Owolabi (2010) pointed out that Nigeria exemplifies the group of developing countries described by Myers (1994) as experiencing extensive environmental degradation, posing a significant threat to their sustained and sustainable development. For instance, in the Niger Delta region of Nigeria, where oil

Received: 03-04-2024; Revised: 27-09-2024; Accepted: 30-09-2024; Published: 30-09-2024; Available online: 30-09-2024 DOI: https://doi.org/10.14710/jab.v13i2.63022

production companies operate, there have been mounting pressures from the local population due to the companies' failure to address the negative impacts of their operations on the environment. This pressure has even led to the closure of several oil production firms in the area. Behram (2015) suggested that companies operating in environmentally sensitive industries are subject to more substantial pressures concerning environmental concerns compared to those in less environmentally sensitive sectors. This is primarily due to the higher potential for pollution in environmentally sensitive industries, resulting in a broader scope of environmental regulations. Consequently, companies in these sectors must comply with more stringent requirements.

Consequently, it is widely accepted that the extent and nature of environmental disclosures tend to differ among industries and sectors. It is typically expected that businesses in environmentally sensitive industries will disclose more detailed environmental information than their competitors in less environmentally sensitive industries (Welbeck et al., 2017). For instance, Wilmshurst and Frost (2000) proposed that petrochemical companies, being part of an environmentally sensitive industry, are likely to place a greater emphasis on addressing environmental issues in their disclosures when contrasted with, for instance, brewing companies. Therefore, it is anticipated that petrochemical businesses will engage in more extensive environmental disclosures than corporations operating in less ecologically sensitive industries if we adopt legitimacy-based explanations.

Although all these companies belong to the manufacturing sector, their operations and activities vary significantly. This study aims to evaluate the differences in corporate environmental disclosure levels across various sectors of listed manufacturing companies in Nigeria. Additionally, it contributes to the existing literature by exploring this issue within the Nigerian context, highlighting the variations in environmental disclosures among these companies.

Literature Review

Corporate Environmental Disclosure

The concept of corporate environmental disclosure stems from corporate social responsibility (CSR) or sustainability reports. These reports are designed to provide stakeholders with information on the economic, social, and environmental impacts of a company's performance over a specific period (Gray, Kouhy, & Lavers, 1995). Corporate social and environmental disclosure, is the process of informing certain interest groups and the general public about the social and environmental effects of an organization's economic actions (Aggarwal, 2018). Similarly, corporate environmental disclosure is a broad term that encompasses various methods through which companies share information about their environmental initiatives with financial statement users (Alok, Nikhil, & Bhagaban, 2008). Wheel and Sillanpea (1998) describe environmental reporting as an effective form of one-way communication with stakeholders.

Sectoral analysis of corporate environmental disclosure involves examining how companies in different industry sectors disclose information related to their environmental performance, sustainability practices, and the impact of their operations on the environment. This type of analysis is essential for various stakeholders, including investors, regulators, and the public, to understand how companies are addressing environmental issues and to compare their performance within their respective sectors.

Empirical Review and Hypothesis Development

The notion of corporate environmental disclosure is referred to by a number of names in the literature, including voluntary disclosure, triple bottom line disclosure, environmental reporting, and environmental accounting. It is important to recognize that the meaning of corporate environmental disclosure often depends on the perspective of the authors discussing it. Scholarly investigations in this field take diverse approaches: some studies assess the extent of corporate environmental disclosure,

comparing it across countries, sectors, or media platforms; others focus on the quality of the disclosed information. Certain study focuses on the connection between a company's environmental performance and its environmental disclosure, while other studies look at the factors that influence corporate environmental disclosure. Furthermore, some of research look into how the market responds to corporate environmental disclosure, as shown by Usman (2019), Andrikopoulos and Kriklani (2013), Damak-Ayadi (2010), and Jose and Lee (2007).

Furthermore, numerous studies have emphasized the imperative need to incorporate sustainability principles across various facets of business operations. This integration is considered essential to the business model lifecycles (as evidenced by Magni et al., 2022 and Mazzucchelli et al., 2022), leadership (as highlighted by Lythreatis et al., 2021 and Singh et al., 2020). Moreover, there exists a substantial body of literature dedicated to examining the creation of value and financial incentives associated with Social Responsibility (SR) and Corporate Social Responsibility (CSR). This literature delves into the financial implications of sustainability, as evident in the works of Broadstock et al. (2020), Chaurasia et al. (2020), Fafaliou et al. (2022), Lee et al. (2022).

In assessing the extent of corporate environmental disclosure and comparing sectors, Roberts (1992) conducted tests to examine industry-specific effects. He categorized industries into two groups: high-profile and low-profile. The results demonstrated a positive correlation between the type of industry and the level of disclosure, with more companies in high-profile industries disclosing their social and environmental initiatives. Similarly, corporations in areas like energy production, forestry and forest products, and oil trade that directly affect the environment, on the other hand, typically include more detailed environmental information in their annual reports than corporations in other industries (Niskala and Pretes, 1995).

Supporting this, Stray and Ballantine (2000) evaluated the variations in environmental disclosure levels among UK companies across six industrial sectors using a survey research design. They found that the prevalence of disclosure varies by sector, with different sectors employing distinct disclosure mechanisms. Similarly, Campbell (2003) observed that companies with higher environmental awareness tend to include more environmental information in their corporate reports over time, compared to less environmentally conscious companies. In a cross-sectoral analysis, Behram (2015) examined environmental disclosures among 223 listed companies in Turkey. The findings showed that companies in sectors with a moderate environmental impact are more likely to disclose environmental information and provide standalone environmental reports or dedicated environmental sections in their annual reports, in contrast to companies in high- and low-impact sectors.

Based on the aforementioned, it can be inferred that there is a lack of research on the sectoral analysis of corporate environmental disclosure because the literature in this area is outdated and lacks consensus. Thus, by examining the differences in environmental disclosure among Nigerian listed manufacturing companies' sectors, this study contributes to the scant body of literature already in existence. Hence, the study hypothesized the below:

H_{01}: *there are no significant differences in the level of corporate environmental disclosure among sectors of listed manufacturing companies in Nigeria.*

Theoretical Framework

The legitimacy theory, according to Dowling and Pfeffer (1975), serves as the foundation for this study. This theory is predicated on the idea that an organization's policies align with those of the broader society. When examining the relationship between organizations and their external environment, the concept of legitimacy plays a crucial role. It establishes a connection that defines what is considered acceptable as the standard mode of behavior in society, including the social values

associated with or inferred from the organizations' activities. Organizations are encouraged to conduct their operations in a manner that is perceived as legitimate by the society they operate within. This entails adopting strategies to ensure that society has confidence in their alignment with its values and norms.

Furthermore, the legitimacy theory states that the level of pressure from the public and the government affects how much environmental disclosure occurs within organizations. This theory, as elucidated by Cho and Patten in 2007, posits that in response to such pressures, companies disclose environmental information to the public, striving to strike a balance between their internal values and societal values. Moreover, when an organization is perceived as failing to maintain this equilibrium, it risks eliciting negative public perceptions, as noted by Milne and Patten in 2002. Organizations lacking legitimacy may find them regarded as less reputable and trustworthy, consequently facing challenges in securing the resources necessary for survival. Conversely, organizations that succeed in gaining and preserving legitimacy are seen as dependable and worthy of support. One of the strategies employed by organizations to acquire, restore, or uphold legitimacy is to utilize communication as a means to project an image of social legitimacy, a concept illuminated by Dowling and Pfeffer in 1975.

Method

The goal of this study was to evaluate the differences in corporate environmental disclosure levels among Nigerian listed manufacturing businesses' sectors through the use of content analysis in an ex post facto research approach. Seventy-six (76) manufacturing enterprises that are listed on the Nigerian Stock Exchange and are divided into seven (7) sectors—consumer products, healthcare, natural resources, oil and gas, industrial goods, and construction/real estate—make up the research population. Manufacturing companies were selected due to their known environmental sensitivity (Welbeck et al., 2017).

The sample size of sixty-four (64) companies was determined using Krejcie and Morgan's sample size determination table. Nine (9) firms were excluded from the sample due to unavailable data. Stratified sampling was employed alongside a random sampling technique to select the sample. This involved dividing the population of each stratum (sector) by the total population and multiplying by the sample size. Companies from each sector were then randomly selected. The study used content analysis as its primary data source, extracting information from the annual reports and accounts of the sampled companies for the 2018 to 2022 accounting years.

To confirm or reject the hypothesis of this study, both descriptive and inferential statistical techniques were employed as part of the quantitative analysis of the collected data. Using descriptive statistics, the annual reports of the selected organizations from 2018 to 2022 were summed up using the mean, standard deviation, minimum, and maximum values. A preliminary diagnostic analysis conducted on the extracted data revealed that it was not normally distributed. Consequently, the Kruskal-Wallis H Test was applied to estimate the differences in disclosure levels across the sampled sectors.

Based on the corporate disclosure index, Prior studies on corporate disclosure have employed various disclosure indices to assess the extent of disclosure. Some researchers have utilized self-constructed checklists, while others have relied on checklists developed by their peers. In line with many previous environmental disclosure studies (Clarkson et al., 2008; Clarkson et al., 2011), this study opted to utilize a checklist created by earlier researchers (Odoemelam & Okafor, 2018). This checklist consists of thirty-five (35) items originally derived from the Global Reporting Initiative (GRI). However, for this study, the checklist was adapted to include twenty-four (24) items, taking into account the sustainability disclosure guidelines issued by the Nigerian Exchange Group on January 2, 2019. To gauge corporate environmental disclosures by the selected companies, this study apply the common 'dichotomous scores' (unweighted index). Despite criticisms that

unweighted indices do not consider the relative importance of each item (Barako et al., 2006), this study adopts the formula introduced by AbuRaya (2012) for calculating the extent of environmental disclosure in the annual reports of the sample companies from 2018 to 2022.

In this study, corporate environmental disclosure is measured using two key components: (i) Environmental Policies and Compliance with Environmental Laws and Standards, and (ii) Product and Process-Related Environmental Issues. These disclosure items were extracted from Odoemelam and Okafor (2018) and aligned with the sustainability reporting guidelines released by the Nigerian Exchange Group. (See appendix for the disclosure index).

Corporate Environmental Disclosure Quantity index for each company is computed according to the below formula by AbuRaya (2012):

$$CED\ Quantity = \sum_{i=1}^{n} \frac{Quantity_i}{Max\ Quantity}$$

Where: CED Quantity = Corporate Environmental Disclosure Quantity Index; Quantity = 1 if item i is disclosed; 0 if item i is not disclosed; MAX Quantity = maximum applicable disclosure quantity score; N = number of items disclosed.

Result and Discussion of Findings

Descriptive Statistics of Variables

This section provides a summary and snapshot of the analyzed data, including the mean, standard deviation, minimum, and maximum values, to explain the variables utilized in the study.

As a stand-in for corporate environmental disclosure, the results of Table 1. show that the mean value for environmental policies and compliance with environmental laws and standards (EPCEL) is 0.367. This falls between a minimum value of 0.210 and a maximum value of 0.640. The standard deviation, measuring 0.087, reflects a notable degree of variability in the mean values. In practical terms, this mean value of 0.210 suggests that, on average, companies are disclosing less than the typical EPCEL requirements, with a variation of 8.7% around this mean. This variance is attributable to the spread between the lowest and highest values within the dataset.

Table 1. Descriptive Statistics

	EPCEL	PPE1	OED
Mean	0.367	0.412	0.389
Maximum	0.640	0.600	0.630
Minimum	0.210	0.240	0.250
Std. Dev.	0.087	0.089	0.079
Obs.	275	275	275

Source: Author's Computation (2023)

Similarly, in the context of product and process-related environmental disclosure (PPE1), the average value is 0.412, lying within the range of 0.240 to 0.600. The standard deviation of 0.089, although relatively low compared to the mean, signifies that the extent of PPE1 disclosure by these companies is somewhat limited, with an 8.9% deviation from the mean values. Furthermore, the Corporate Environmental Disclosure Index (OED) exhibits a mean value of 0.389, fluctuating between 0.250 and 0.630. The standard deviation, at 0.079, suggests a relatively tight clustering of values around the mean. This implies that the manufacturing companies examined in the study possess a fair level of understanding regarding the corporate environmental information to be disclosed.

However, their actual level of compliance falls below the average maximum value,

Table 2. Kolmogorov-Smirnov and Shapiro-Wilk Table

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
EPCEL	.146	275	.000	.928	275	.000
PPE1	.206	275	.000	.882	275	.000
OED	.137	275	.000	.946	275	.000

a. Lilliefors Significance Correction.

showing a low dispersion of 7.9% around the mean.

Preliminary Tests

Test for Normality

The Kolmogorov-Smirnov and Shapiro-Wilk assumption on normality of a sample holds that for a data to be normally distributed, the p-value must be insignificant i.e. it must be greater than 0.05 (Aifuwa & Okojie, 2015; Aifuwa, Embele & Saidu, 2018). From the Table 2. revealed that the data is not normally distributed as p-value is significant at 0.000.

Restatement and Test of Hypothesis

$H_{01:}$ = there is no significant difference in the level of corporate environmental disclosure among sectors of listed manufacturing companies in Nigeria.

This section examines whether significant differences exist in corporate environmental disclosure levels among various sectors of listed manufacturing companies. The Kruskal-Wallis H test was employed for this analysis due to the non-normal distribution of the collected data, as it allows for the comparison of continuous variable scores across three or more groups (Pallant, 2008; Aifuwa & Okojie, 2015). Additionally, a post hoc test was conducted to identify the specific sectors that exhibited statistically significant differences. The choice of the appropriate post hoc test depends on the homogeneity of variance in the dependent variable (Aifuwa & Okojie, 2015). To assess the homogeneity of variance, Levene's test was utilized.

Levene's statistics and degrees of freedom for corporate environmental disclosure: LV(6, 268) = 2.799, p = 0.12; LV(6, 268) = 4.197, p = 0.000; and LV(6, 268) = 3.943, p = 0.001 for EPCEL, PPE1, and OED, respectively. Since the p-values for EPCEL and PPE1 are less than 0.05, this indicates a lack of homogeneity of variance among the study variables (Pallant, 2008). Consequently, due to the violation of the homogeneity of variance assumption, it is necessary to conduct Robust Tests of Equality of Means using the Games-Howell post hoc test.

Table 3. Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
EPCEL	2.799	6	268	.012
PPE1	4.197	6	268	.000
OED	3.943	6	268	.001

Source: Author's Computation (2023)

Table 4. presents the results of the Robust Tests of Equality of Means. All variables met the assumptions of equality of means, with $p < 0.05$ (Pallant, 2008).

Table 4. and Table 6. present the results of the Kruskal-Wallis Test, which revealed a statistically significant difference in environmental disclosure levels among sectors of listed manufacturing companies ($\chi(6) = 49.798$, $p = 0.001$) at the 5% level of significance. The mean ranks for environmental disclosure levels across sectors were as follows: Construction/Real Estate (86.67), Consumer Goods (164.25),

Table 4: Robust Tests of Equality of Means

		Statistic[a]	df1	df2	Sig.
EPCEL	Welch	6.789	6	80.497	.000
	Brown-Forsythe	8.882	6	161.380	.000
PPE1	Welch	16.354	6	79.197	.000
	Brown-Forsythe	13.247	6	173.195	.000
OED	Welch	13.029	6	85.491	.000
	Brown-Forsythe	11.832	6	160.928	.000

a. Asymptotically F distributed.

The results presented in Table 3. illustrate the outcomes of the homogeneity test for variance. The analysis yielded the following

Healthcare (83.00), Industrial Goods (130.08), Natural Resources (126.75), Oil & Gas (183.94), and Conglomerates (122.38). Post-hoc comparisons conducted using the Games-

Howell test indicated that the environmental disclosure level in the Construction/Real Estate sector was not statistically different from the Healthcare sector (MD = 0.017, SE = 0.015, p = 0.917), Natural Resources (MD = -0.028, SE = 0.020, p = 0.805), and Conglomerates (MD = -0.028, SE = 0.014, p = 0.400). However, it was found to be statistically different from the Consumer Goods sector (MD = -0.064, SE = 0.011, p = 0.001), Industrial Goods sector (MD = -0.033, SE = 0.010, p = 0.032), and Oil & Gas sector (MD = -0.098, SE = 0.015, p = 0.001) at the 5% level of significance.

Similarly, the analysis of environmental information related to environmental policies and compliance with environmental laws and standards revealed a statistically significant difference among sectors of listed manufacturing companies ($\chi(6) = 38.690$, p = 0.001) at the 5% level of significance. The mean ranks for environmental disclosure levels were as follows: Construction/Real Estate (123.83), Consumer Goods (146.91), Healthcare (100.50), Industrial Goods (112.58), Natural Resources (139.88), Oil & Gas (194.25), and Conglomerates (149.88). The Construction/Real Estate sector's disclosure level of environmental policies and compliance with environmental laws and standards was not significantly different from the Consumer Goods sector, according to post-hoc comparisons using the Games-Howell test (MD = -0.022, SE = 0.014, p = 0.696), Healthcare (MD = 0.028, SE = 0.017, p = 0.690), Industrial Goods (MD = 0.008, SE = 0.015, p = 0.998), Natural Resources (MD = -0.020, SE = 0.025, p = 0.984), and Conglomerates (MD = -0.028, SE = 0.014, p = 0.700) sectors. However, it was found to be statistically different from the Oil & Gas sector (MD = -0.089, SE = 0.019, p = 0.001) at the 5% level of significance.

Lastly, the analysis of environmental information related to product and process-related environmental issues indicated a statistically significant difference among sectors of listed manufacturing companies ($\chi(6) = 56.750$, p = 0.001) at the 5% level of significance. The mean ranks for disclosure levels were as follows: Construction/Real Estate (98.83), Consumer Goods (175.03), Healthcare (84.25), Industrial Goods (134.25), Natural Resources (107.38), Oil & Gas (168.63), and Conglomerates (107.38). Post-hoc comparisons using the Games-Howell test revealed that the disclosure level for product and process-related environmental issues in the Construction/Real Estate sector was not statistically different from that of the Healthcare sector (MD = 0.017, SE = 0.018, p = 0.917), Industrial Goods (MD = -0.037, SE = 0.018, p = 0.376), Natural Resources (MD = -0.008, SE = 0.023, p = 1.000), and Conglomerates (MD = -0.008, SE = 0.023, p = 1.000). However, it was statistically different from the Consumer Goods sector (MD = -0.090, SE = 0.016, p = 0.001) and the Oil & Gas sector (MD = -0.083, SE = 0.017, p = 0.001) at the 5% level of significance.

Table 5. Rank

	SECTOR	N	Mean Rank
EPCEL	Construction/Real Estate	15	123.83
	Consumer goods	80	146.91
	Health Care	40	100.50
	Industrial Goods	60	112.58
	Natural Resources	20	139.88
	Oil & Gas	40	194.25
	Conglomerate	20	149.88
PPE1	Construction/Real Estate	15	98.83
	Consumer goods	80	175.03
	Health Care	40	84.25
	Industrial Goods	60	134.25
	Natural Resources	20	107.38
	Oil & Gas	40	168.63
	Conglomerate	20	107.38
OED	Construction/Real Estate	15	89.67
	Consumer goods	80	164.25
	Health Care	40	83.00
	Industrial Goods	60	130.08
	Natural Resources	20	126.75
	Oil & Gas	40	183.94
	Conglomerate	20	122.38

Source: Author's Computation (2023)

Table 6. Test Statistics [a,b]

	EPCEL	PPE1	OED
Chi-Square	38.690	56.750	49.789
Df	6	6	6
Asymp. Sig.	.000	.000	.000

a. Kruskal Wallis Test
b. Grouping Variable: SECTOR

Source: Author's Computation (2023)"

The results of the Kruskal-Wallis test indicate significant differences in corporate environmental disclosure levels among various sectors of listed manufacturing companies in Nigeria. This suggests that, despite all these companies being classified within the manufacturing industry—generally recognized for its environmental sensitivity (Welbeck et al., 2017)—the extent of their environmental disclosure varies. This variance may be attributed to the distinct nature of their manufacturing operations. Although classified as manufacturing companies, these entities engage in diverse manufacturing processes, leading to the observed discrepancies in their environmental disclosure practices. Notably, the Oil and Gas sector stands out with the highest mean environmental disclosure score of 183.94, reflecting the most comprehensive corporate environmental information.

Furthermore, the Oil and Gas sector excels in disclosing information related to environmental policies and compliance with environmental laws and standards, achieving a leading mean score of 194.25. This underscores their commitment to effectively communicating how they address and mitigate the adverse environmental impacts of their operations. On the other hand, with a mean score of 175.03, the Consumer Goods industry leads in revealing information about environmental issues related to products and processes. This indicates that the Consumer Goods sector places a strong emphasis on transparency regarding the environmental consequences of its operational activities.

Conclusion and Recommendation

Conclusion

Based on the findings and empirical results of the tested hypothesis, the study concludes that there are variations in corporate environmental disclosure levels among sectors of listed manufacturing companies. These differences arise from the distinct nature of operations and activities within each manufacturing sector.

Recommendations

Based on the findings, the study recommends the establishment of a standardized template for corporate environmental disclosure to ensure uniformity in the environmental information disclosed by listed firms in Nigeria. Additionally, the Securities and Exchange Commission (SEC) should impose sanctions on companies that fail to provide such disclosures. Further research should consider the annual reports from 2018 and 2019, as access to this data was not available during this study. Future researchers could also expand the scope of this study to include an inter-country analysis of corporate environmental disclosure, as it would be valuable to perform a comparative analysis across multiple nations.

References

Aburaya, R. (2012). *The relationship between corporate governance and environmental disclosure: UK evidence* (Unpublished Doctoral dissertation, The Durham University U.K). Retrieved from http://etheses.dur.ac.uk/view/department/DDD2.html on 25/3/12.

Aggarwal, P. (2018). Sustainability Reporting and Its Impact on Corporate Financial Performance: a Literature Review. *Indian Journal of Commerce & Management Studies*, *IV*(3), 51–60.

Aifuwa, H. O. & Okojie, P. I. (2015). *Materials and methods: SPSS demystified. Unpublished manuscript,* College of Management Sciences, Samuel Adegboyega University, Ogwa, Edo State, NG.

Aifuwa, H. O &Embele, K. (2019). Board characteristics and financial reporting quality. *Journal of Accounting and Financial Management, 5*(1), 30-49.

Alabi, A. T., Issa, O. S., & Usman, M. K. (2024). Corporate Environmental Reporting: Do Firms Operating in Environmentally Sensitive Sectors Disclose Enough?. *Sustinere: Journal of Environment and Sustainability*, *8*(2), 242-261.

Alawiye-Adams, Adewale Adegoke and Akomolafe, Adesola, Environmental Disclosure Practices in Annual Reports of Listed Manufacturing Firms in Nigeria (April 11, 2017). Available at SSRN: https://ssrn.com/abstract=2951272 or http://dx.doi.org/10.2139/ssrn.2951272

Alok, P., Nikhil, S. &Bhagaban. D. (2008). Corporate Environmental Reporting: An Emerging Issue in the Corporate World. International Journal of Business and Management. 3. 10.5539/ijbm.v3n12p146.

Behram, N. (2015). A structuration view on the initiation of environmental reports. Critical Perspectives on Accounting 13 (1): 17–38.

Broadstock, D. C., Matousek, R., Meyer, M., & Tzeremes, N. G. (2020). Does corporatesocial responsibility impact firms' innovation capacity? The indirect link betweenenvironmental & social governance implementation and innovation performance.*Journal of Business Research, 119, 99–110.* https://doi.org/10.1016/jjbusres.2019.07.014

Campbell, D. (2003).Intra-and International effect in environment disclosure:evidence for legitimacy theory' Business strategy and the environment, 12 (6): 357-371.

Chaurasia, S. S., Kaul, N., Yadav, B., & Shukla, D. (2020). Open innovation forsustainability through creating shared value-role of knowledge management system,openness and organizational structure. *Journal of Knowledge Management, 24(10), 2491–2511.* https://doi.org/10.1108/JKM-04-2020-0319

Cho, C.H., Roberts, R.W. and Patten, D.M. (2010), The language of US corporate environmental disclosure, *Accounting, Organiza-tions and Society* **35**(4), 431-443.

Deegan, C., & Gordon, B. (1996). A study of the environmental disclosure practices of Australian corporations. *Accounting and Business Research*, *26*(3), 187–199. https://doi.org/10.1080/00014788.1996.9729510.

Dowling, J.& Pfeffer, J. (1975). Organizational Legitimacy: Social Values and Organizational behaviour. Pacific Sociological Review.January,pp.122-36.

Else, T., Choudhary, S., & Genovese, A. (2022). Uncovering sustainability storylines from dairy supply chain discourse. *Journal of Business Research, 142, 858–874.* https://doi.org/10.1016/j.jbusres.2021.12.023.

Fafaliou, I., Giaka, M., Konstantios, D., &Polemis, M. (2022). Firms' ESG reputational risk and market longevity: A firm-level analysis for the United States. *Journal of Business Research, 149, 161–177.* https://doi.org/10.1016/j.jbusres.2022.05.010

Frost, G.R., & Wilmshurst, T.D. (2000). The adoption of environment-related management accounting: An analysis of corporate environmental sensitivity. *Accounting Forum, 24*(4), 344-365.

Gamble, G., Hsu, K., Jackson, C. & Tollerson, C., (1996). "Environmental disclosures in annual reports: An international perspective," The International Journal of Accounting, Elsevier, vol. 31(3), pages 293-331.

Gray; Kouhy, Reza; Lavers, S. (1995). Corporate social and environmental reporting : A review of the literature and ... *Accounting, Auditing & Accountability Journal*, *8*(2), 47–77.

Gu, W., & Wang, J. (2022). Research on index construction of sustainable entrepreneurship and its impact on economic growth. *Journal of Business Research, 142, 266–276.* https://doi.org/10.1016/j.jbusres.2021.12.060.

Hackston, D. & Milne, M.J. (1996) Some Determinants of Social and Environmental Disclosures in New Zealand Companies. *Accounting, Auditing & Accountability Journal*, 9, 77-108. http://dx.doi.org/10.1108/09513579610109987

Higgins, C., Tang, S., & Stubbs, W. (2020). On managing hypocrisy: The transparency of sustainability reports. *Journal of Business Research, 114, 395–407.* https://doi.org/10.1016/j.jbusres.2019.08.041

Kazemi, M. Z., Elamer, A. A., Theodosopoulos, G., & Khatib, S. F. (2023). Reinvigorating research on sustainability reporting in the construction industry: a systematic review and future research agenda. *Journal of business Research*, *167*, 114145.

Lee, M. T., Raschke, R. L., & Krishen, A. S. (2022). Signaling green! Firm ESG signals inan interconnected environment that promote brand valuation. *Journal of Business Research, 138, 1–11.* https://doi.org/10.1016/j.jbusres.2021.08.061

Lythreatis, S., Mostafa, A. M. S., Pereira, V., Wang, X., & Giudice, M. D. (2021). Servantleadership, CSR perceptions, moral meaningfulness and organizational identification: Evidence from the Middle East. *International Business Review, 30(5), Article 101772.*https://doi.org/10.1016/j.ibusrev.2020.101772

Magni, D., Palladino, R., Papa, A., &Cailleba, P. (2022). Exploring the journey ofResponsible Business Model Innovation in Asian companies: A review and futureresearch agenda. *Asia Pacific Journal of Management*. https://doi.org/10.1007/s10490-022-09813-0.

Mazzucchelli, A., Chierici, R., Del Giudice, M., & Bua, I. (2022). Do circular economypractices affect corporate performance? Evidence from Italian large-sized manufacturing firms. Corporate Social Responsibility and Environmental Management.doi: 10.1002/csr.2298.

Myers, T. (1994). Measuring the release of organic contaminants from melting snow under controlled conditions. Environmental Science & Technology 40(10):3320-3326.

Odoemelam, N., &Ofeagbu, T. (2018). Corporate Board Characteristics and Environmental Disclosure Quantity: A Comparative Analysis of Traditional and Integrated Reporting Evidence, (August). https://doi.org/10.20944/PREPRINTS201808.0419.V1

Odoemelam, N., & Okafor, G. (2018). Corporate Board Characteristics and Environmental Disclosure Quantity: A Comparative Analysis of Traditional and Integrated Reporting Evidence, (August). https://doi.org/10.20944/PREPRINTS201808.0419.V1

Owolabi, A. (2010). Corporate social responsibility disclosures of Nigerian companies from 2006 to 2010. Retrieved from http://www.utas.edu.au, 20.10.2012.

Roberts, A. (1992). Environmental reporting by Indian corporations. *Corporate Social Responsibility and Environmental Management*, *11*(1), 12–22. https://doi.org/10.1002/csr.51

Singh, S. K., Giudice, M. D., Chierici, R., & Graziano, D. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change, 150, Article 119762.* https://doi.org/10.1016/j.techfore.2019.119762

Usman, M. K. (2019). Determinants of Corporate Environmental Disclosures Among listed Manufacturing Companies in Nigeria. *ProQuest Publications*

Usman, M. K. (2024). Sustainability Committee, Audit Firm Type and Corporate Sustainability Reporting of Non-Financial Firms in Nigeria. *Copernican Journal of Finance & Accounting*, *13*(1).

Wheel, D, &Sillanpea, M. (1998). Including the stockholders the business case long range planning 31 (2):201

Welbeck, E. E., Owusu, G. M. Y., Bekoe, R. A., &Kusi, J. A. (2017). Determinants of environmental disclosures of listed firms in Ghana. *International Journal of Corporate Social Responsibility*, *2*(1). https://doi.org/10.1186/s40991-017-0023-y

Appendix

Corporate Environmental Disclosure Index

	Corporate environmental disclosure	Score
A	**Environmental Policies and Compliance with Environmental Laws and Standards**	
1	Actual statement of Environmental Policies	
2	Departments or Positions for environmental and/or safety Management	
3	Past, current or future estimates of capital and operating expenditure for environmental protection or remediation	
4	Environmental investment & investment appraisal	
5	Financing of pollution control equipment and facilities	
6	Research and development expenditure for pollution abatement	
7	Environmental impact studies	
8	Environmental contingent liabilities and provisions	
9	Conservation of natural resources	
10	Health and safety policies	
11	Discussion of environmental regulations and requirements	
12	Compliance with pollution laws and regulations	
13	Compliance with health and safety standards and regulations	
14	Compliance status with environmental and/or health and safety such as ISO, EMS, BS OHSAS and PAS	
B	**Product and Process-Related Environmental Issues**	
1	Pollution emissions and effluent discharge	
2	Waste management	
3	Packaging	
4	Recycling initiatives	
5	Products and product development/ innovation	
6	Efficient use of materials	
7	Energy efficiency of products/ energy consumption	
8	Water consumption	
9	Product Safety	
10	Product stewardship (product's impact on the environment)	

Source: Odoemelam and Okafor (2018); NSE (2019); Usman (2019)