INTERNATIONAL REVIEW OF FINANCIAL STUDIES | IROFS
Vol 1, Issue 2;December, 2024 / visit: https://journals.unizik.edu.ng/irofs

INSTITUTIONAL TRAITS AND SUSTAINABILITY DISCLOSURES OF LISTED MANUFACTURING COMPANIES IN NIGERIA

Anthony Onyeka Anyadufu[1] Eneh Onyinye[2] Francis Nnoli Udeh[3] George Ezeala[4]

[1]*Anambra State Polytechnic Mgbakwu, Anambra State, Nigeria.*
[2, 3, & 4]*Department of Accountancy, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.*
Email: anthony.anyadufu@anspoly.edu.ng[1], o.eneh@unizik.edu.ng[2], fn.udeh@unizik.edu.ng[3], & ezeala4george@yahoo.com[4]

***All correspondence to**:* anthony.anyadufu@anspoly.edu.ng

ABSTRACT

The study presents empirical evidence on Institutional traits and sustainability disclosures of listed Manufacturing companies in Nigeria using annual financial report data for the period 2012-2023. In order to determine the relationship between Institutional traits and non-financial disclosures, the researcher used the ex-post facto research design. The target population comprised 13 companies in the Industrial Sector listed on the Nigerian Exchange Group. The study adopted the Ex-post facto, the data were tested using skewness and kurtosis statistic and analyzed using unit root test, co-integration test, vector error correction model and Panel Least Square Regression analysis via E-Views to compute data from line and bottom-line items in financial statements. Content analysis was used to measure Effluent disclosures. Firm Size has a significantly impact on effluent disclosure of listed manufacturing companies in Nigeria.

Key words: *Effluent Disclosures, Firm Size, Institutional Traits, Manufacturing companies, Sustainability disclosures,*

CITE AS: Anyadufu, A.O., Eneh, O., Udeh, F.N. & Ezeala, G. (2024). Institutional traits and sustainability disclosures of listed manufacturing companies in Nigeria, *International Review of Financial Studies*, 1(2), 38 - 55. Available: https://journals.unizik.edu.ng/irofs

1. INTRODUCTION

Business organizations are composed of different components or parts that interact in a positive way to achieve the overall goals and objectives of primarily the shareholders and secondarily the stakeholders. To the owners of the business, their primary aim is would be to maximize their return on investment. Irrespective of the kind of business organization, there are certain institutional traits that affect their way of operation. However, the corporate business environment is surrounded by strong public scrutiny from diverse stakeholders that are calling on corporate firms to accept accountability for not only their financial actions, but also the non-financial implications of their activities (Tareq, Reza and Aminu, 2017). As a result, most corporate organizations are today paying attention to the needs of their stakeholders by disclosing the activities of their corporate social responsibility as part of their corporate reporting standards in consolidating their relationship with the stakeholders and the

society. According to Nirwana J. T and Wedari L.K (2023), firm characteristics have been found to be an influential variable that determine the level of non-financial disclosure practice among firms. This is because larger firms act to protect their reputation and are likely to disclose more information than smaller firms. Deril (2023) observed that agency costs are succinctly higher for higher firms given their larger number of shareholders. Meanwhile, several studies have been carried out to ascertain the impact of firm characteristics on environmental disclosure (Tarus, 2020, Ezhilarasi and Kailash, 2017, Adeyemi and Ayanlola, 2015). According to Dibia and Onwuchekwa (2015) researchers have made considerable efforts at identifying factors motivating corporate organizations to disclose environmental sustainability information in their annual reports despite the voluntary nature of environmental sustainability information disclosure. For instance, prior studies have evaluated the role of certain firm-specific factors (leverage, profit, industry type and firm size) at determining corporate environmental disclosure (Dibia & Onwuchekwa, 2015). Few have, however, assessed the effect of firm size on effluent disclosures of listed Industrial companies listed in the Nigerian Exchange Group.

In recent years, there has been an increasing need for corporate organizations to conscientiously disclose sustainability report as part of their annual reporting systems. Extant literature according to Rouf (2023) has attempted to explain this aspect of corporate disclosures that lie outside the confines of the conventional framework of accounting disclosures. However, Adeboye, (2010) classified disclosures into financial and non-financial disclosures. He further divided non-financial disclosure to include corporate social responsibility and environmental disclosure, Environmental disclosure emerged in the mid-90s with the first disclosures in accordance with the Global Disclosure Initiative (GDI) of environmental disclosure policy framework in 1999 (Muhammadu, 2023). The global disclosure initiative standard explains that non-financial reporting is the practice of being accountable to both internal and external stakeholders of organizations by measuring and disclosing firms' performance to the goal of the organization (Rotimi, 2015). However, corporate organizations like manufacturing firms whose activities constitute air pollution, gaseous emissions caused mainly by gas-faring, exhausts of automobiles and diesel power generators as well as water and environmental degradation should always interact with their host communities through the institutionalization of corporate social responsibility that would make them socially responsible.

To fill the lacuna in the literature, the study investigates the quality of disclosure by using environmental disclosure quality rating index adapted from Global Reporting Initiatives (2011) to extract data and information from the sustainability report, corporate governance report and other annual reports from the companies and Nigerian Stock Exchange websites. Therefore, the objective of this study is to examine the effect of Firm Size and Efficient disclosure of listed manufacturing companies in Nigeria.

1.1 **Objective**

The main objective of this study is to ascertain the effect of Institutional traits and Sustainability disclosures of listed manufacturing companies in Nigeria. The specific objective is to:

1. Determine the effect of firm size on effluent disclosures of listed manufacturing companies in Nigeria.

1.2 Hypothesis

H_{01}: Firm Size does not significantly impact on effluent disclosure of listed manufacturing companies in Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Institutional Traits

Institutional traits are those firm attributes and managerial variables which in turn, constitute part of the corporation's internal environment (Mohamed & Reham, 2018). There are several firms' features and other factors that are considered sacrosanct in determining firm's willingness to disclose but largely vary across firms based on location, nature of business, legislation and time. According to Adams (2002), the philosophy and attitude of firms' management are also important factors to be considered in assessing predictors of firms' non-financial disclosure. Other predictors that would demotivate firms' non-financial disclosure practices include Firm Size, Firm liquidity, Board Size et cetera.

2.1.2 Firm Size

Firm size is the measurement of the company in general, most especially in terms of total assets, total revenue, stock market conditions, market capitalization and other company resources (Handoyo, Mulyani, Ghani, & Soedarsono, 2023). Agency theory suggests that agency costs are associated with the separation of management from ownership, which is

likely to be higher in larger companies (Jackson, G., Bartosch, J. and Avetisyan, (2020). Large companies are expected to have more incentive to voluntarily disclose additional information in their annual reports than smaller firms, to reduce agency cost. Additionally, managers of larger companies tend to be more motivated to disclose more information in order to create or maintain strong demand for their securities (Mbonu & Okoye, 2023). Larger companies are expected to disclose more information than smaller companies in their published annual reports for a number of reasons (Razaq, Alhassan, & Omole, 2024). It should be noted that collection, preparing and disclosure a great amount of financial and non-financial information is relatively less costly for large companies than smaller companies. Large companies also disclose more financial and non-information in their published annual reports because they are more aware of the potential benefits of additional disclosure for increasing stakeholders" confidence and attracting new investors. In some smaller companies, the managers are likely to feel, more than executives of large companies, that full disclosure of information might endanger their competitive position (Ekwueme & Aniefor, 2019). Total Asset would be used as a measure for calculating firm size in this research.

2.1.3 Sustainability Report

Sustainability reporting is a way for companies to report on matters relating to environmental, social, and ethical factors in the work they do. This report allows companies to reflect on this and report in a transparent fashion their positive and negative impacts. Sustainability report helps to balance both financial and non-financial disclosures. Non-financial disclosure is a process of gathering and disclosing non-financial aspects of a company's performance, including environmental, social, employee and ethical matters, and defining measurements, indicators and sustainability goals based on the company's strategy. Non-financial disclosure might be performed according to the Global Initiative's Disclosure methodology, which defines sustainability reporting guidelines and the best practice in the field (Deloitte, 2019).

2.1.4 Effluent Disclosure

Environmental challenges confronting the world at large and Nigeria are enormous. Our environment is more threatened now than ever before as evidenced increased pollution, emission, degradation, deforestation and other climate change effect heading to high mortality rate as a relation of deadly diseases across globe (Oshiole, Elamah & Amahalu, 2020). Effluent is sewage that has been treated in a septic tank or sewage treatment plant. It is also referred to as trade effluent or wastewater (Ryou, Tsang, and Wang, 2021). Effluent is waste

other than waste from kitchens or toilets, surface water or domestic sewage. It can be produced and discharged by any industrial or commercial premises (Okudo & Amahalu 2021).

2.1.5 Manufacturing Companies in Nigeria

Manufacturing activities have a significant impact on the economy of a nation. In developed economies, for instance, they account for a substantial proportion of total economic activities. In Nigeria, the sub-sector is responsible for about 10% of total GDP annually. In terms of employment generation, manufacturing activities account for about 12 per cent of the labour force in the formal sector of the nation's economy. This is why manufacturing statistics are relevant indices of the economic performance of a nation. (NBS, 2014). As of 2022, there are 173 listed manufacturing companies in Nigeria according to Statista (2024). This research would be centered on the manufacturing companies that deal in the Industrial and Consumer sector of the Nigerian Economy.

2.2 Empirical Review

Atube and Okolie (2024) explored the impact of non-financial information disclosures on the performance of non-financial services firms listed in Nigeria. It utilized an ex-post facto research design on panel data extracted from annual financial reports of selected firms spanning from 2013 to 2022. The methodology involved Generalized Linear Models (GLS) regression analysis, performed using E-Views V.9.0 software. Diagnostic tests were conducted to ensure compliance with panel assumptions, and hypotheses were evaluated based on the specific model formulated. The study utilized two models with dependent variables being accounting based (Return on Equity - ROE) and market-based (Net Assets per Share - NAPS) to measure various independent variables (environmental, social, corporate governance, and forward-looking disclosures). With p-values of 0.000 and 0.0433 for the models ROE and NAPS, respectively, the analysis's findings showed that environmental disclosures significantly and favorably affect the performance of listed non-financial companies in Nigeria. Social disclosures had negative p-values in both NAPS and ROE (0.0113 and 0.1310, respectively). However, corporate governance was statistically significant in ROE but negligible in NAPS.

Dagunduro, Falana, Ajayi and Boluwaji (2024) explored the relationship between non-financial disclosures within the context of listed consumer goods manufacturing firms in Nigeria. The study encompassed a population of 21 listed consumer goods manufacturing firms in Nigeria. The sample size was 21 firms, determined through census sampling

techniques. The research spanned from 2013 to 2022. FGLS regression model was used to examine the relationship between the variables studied. The results found that environmental disclosure and social disclosure had a positive and significant effect on the firm's performance. While governance disclosure had a negative and significant effect on the firm's performance. This implies that firms that engage in robust non-financial disclosure practices tend to experience better overall performance. The study concludes that non-financial disclosure, encompassing environmental, social, and governance aspects, plays a pivotal role in influencing the performance of listed consumer goods manufacturing firms in Nigeria. Firms are encouraged to enhance their ESG reporting frameworks, aligning with stakeholder expectations and global sustainability trends.

Razaq, Alhassan and Omole (2024) There has been a growing recognition of possible negative impact of climate on investments. Investors generally are now demanding for climate related financial disclosures as part of general-purpose financial reporting, useful for investment decision making. However, it is argued that this depends on the investment appetite and ownership structure of the companies in question. This study examines effect of ownership structure on climate-related financial disclosure of listed non-financial firms in Nigeria. The study measures ownership structures with institutional, managerial, foreign and ownership concentration as independent variables, while climate related financial disclosures are measured by the extent of disclosures on environment in line Global Reporting Initiative (GRI) guidelines. The study adopted ex-post facto research design relying on secondary data obtained from annual financial statements of the population for the period 2013 – 2022. The population of this study comprised of 116 non-financial firms listed on the Nigeria Exchange Group (NGX) as at 31st December 2022 and using Tero Yamane's sampling method, the study arrived at sample size of 51 firms. According to the results of random effect regression of multiple regression, institutional ownership and foreign ownership are statistically significant to the extent of climate related disclosures of listed non-financial firms in Nigeria. Based on the findings, the study concluded that institutional ownership and foreign ownership can effectively enhance the climate related financial disclosures of firms. Hence, it is recommended that Government and relevant regulatory agencies should consider a review of ownership structure of listed firms in Nigeria to cater for diverse interests of various stakeholder groups.

Samuel, Festus, Okwoma Ejiro and Erume (2024) Firm characteristics include firm size, leverage, liquidity, sales growth, asset growth and turnover. Others include ownership

structure, board characteristics, age of the firm, dividend pay-out, profitability, access to capital markets and growth opportunities. The study adopted the use of discretionary accruals research design. The population of this study consists of all quoted non-financial firms on the floor of the Nigerian Exchange Group (NGX). There were 154 quoted firms on the NGX as at 31st December, 2022 (NGX, 2022). Out of those firms, 46 were classified as financial quoted firms while the non-financial was 108. The statistical formula for determining sample size is used to determine the sample size with 5% being used as the limit of tolerable error. The sample size according to Okeke, (1995), which made the sample to be 80. The results from the panel regression estimated reveal mix findings for the firm characteristic variables in relation to the financial reporting quality. The result showed that profitability is found to have no significant relationship with financial reporting quality, leverage was found to have a positive relationship with financial reporting quality. The study recommends that emphasis should not be on structuring the financial report to show profit at all cost but rather management should prepare the financial statement to show the true state of affairs of the firm at any point in time.

Salawu (2024) examined influence of various distinctive firm attributes on environmental reporting commitment in Nigeria. To assess the extent of environmental disclosure, the Kinder Lydenberg Domini (KLD) indices were deployed in measuring firm's commitment to environmental Disclosure (ED). The study nestles upon stakeholder theory and legitimacy theory. Data were gathered over a nine-year period (2012-2020). Ordinary least square was found appropriate in estimating the regression for this study. The finding shows that firm size and foreign company affiliation significant and positively related to ED. Board size, financial performance, and leverage had no significant influence on firm's commitment activities and ED. The study recommends that the need for NSE to speed up on adoption of the guideline for environmental disclosure by listed firms is paramount and should be giving utmost consideration.

Soomiyol, Wajir and Henry (2024), examined the effect of firm characteristics on environmental disclosure practices of listed manufacturing companies in Nigeria, the objectives of the study were to determine the effect of firm age, size, profitability and leverage of a company on environmental disclosure of listed manufacturing companies in Nigeria. The study adopted ex-post facto research design. The findings shows that firm age, profitability and leverage has a negative insignificant effect while firm size has a significant positive effect on environmental disclosure of listed manufacturing companies in Nigeria. The study

recommended among others that Since firm age, size, profitability does not affect environmental disclosure, younger companies that are new in the market should strive to disclose more environmental information in order to attract investors who are environmentally inclined.

Musa (2024) investigated the effect of ownership settings on Nigerian listed firms' environmental disclosure for the period 2012 – 2022. The predicting variables includes managerial ownership, foreign ownership, government ownership, and institutional ownership. A correlational approach was adopted to explore the variables' natural relationships. Published annual reports of 95 Nigerian listed firms were used as a source of secondary data. The extent of environmental disclosure by the sampled firms was measured using the Global Reporting Index (GRI). Panel regression analysis revealed that foreign, government and institutional ownership have a significantly positive effect on environmental disclosure among Nigerian listed firms. Although, the findings did not yield conclusive evidence on a link between managerial ownership and environmental disclosure among the companies. The results of this study are crucial for regulatory authorities, stakeholders and policymakers, as it pinpoint the most effective strategies for firms to address environmental disclosure challenges and highlight key factors that drive and enhance environmental transparency. As a result, the study recommended that the industry regulators should work together with government in revitalizing the nation's economy which in turn encourage more investment from foreign investors. Additionally, management should prioritize and encourage government and institutional holding in the Nigerian listed firms as there monitoring characteristics can enhance firm's environmental disclosure practices.

Ubiomoh, and Okoye (2024). ascertained the effect of board characteristics on environmental disclosure of listed oil and gas firms in Nigeria and Ghana for twelve (12) year period spanning from 2012-2023. Specifically, this study ascertained the effect of board size and board independence on effluent disclosure. Panel data were used in this study, which were obtained from the annual reports and accounts of twelve (12) listed oil and gas companies for the periods 2012-2023. Ex-Post Facto research design was employed. Inferential statistics using Pearson correlation coefficient and Panel least square regression analysis were employed to test the hypotheses of the study. Conclusively, the results of the tested hypotheses revealed that board size has a significant but negative effect on effluent disclosure ($\beta 1 = -0.016095$; p-value = 0.0000 < 0.05); while Board independence has a significant and positive effect on effluent disclosure ($\beta 1 = 0.037481$; p-value = 0.0000 < 0.05. Conclusively, Board

attributes have mixed effect on environmental disclosure of listed oil and gas firms in Nigeria and Ghana. The study recommended amongst others that the independent to enable them perform their functions effectively.

Bas (2023) The increase in institutional ownership, the shift towards passive portfolio management and the rise of common ownership have transformed OECD countries financial markets in the last decades. The paper investigates the potential consequences of these transformations on firm's productivity, using granular data on firms financial and ownership structure as well as a variety of econometric methods. The analysis suggests that the rise of institutional investors is overall not a major concern from a productivity standpoint: firms displaying higher institutional ownership tend to have higher productivity levels and growth rates compared to their peers, though the positive relationship tends to vanish when institutional investors' time horizon is short. Moreover, inter-industry common ownership is related to higher firm-level productivity and this positive relation is stronger for firms operating in intangible-intensive and digital sectors, potentially hinting to an easing of vertical relationships and/or technological spillovers when firms operating in different sectors are owned by the same equity holders. On the contrary, the correlation with intra-industry common ownership appears negative, though not always significantly, potentially due to lower competition.

Orumwense and Osa-Izeko (2023) examined the influence of board diversity on environmental sustainability disclosure in oil and gas companies in Nigeria. The goal of this study is to ascertain whether factors such as board size, board gender, board nationality, and board independence have an impact on environmental sustainability disclosure in Nigerian oil and gas companies. Ex-post facto research approach was used in this study to explore the cause-and-effect relationship between the dependent and independent variables. The study comprised of eight oil and gas companies in the Nigerian Exchange Group. Secondary data from 2011-2020 was used and panel multiple regression analysis was used to analyze the data. Results revealed board independence (BIND) showed positive relationship with environmental sustainability disclosure, but was insignificant to environmental sustainability disclosure, board size (BSZ) showed negative relationship with environmental sustainability disclosure, but was significant to environmental sustainability disclosure, while board gender diversity (BGD) showed negative relationship with environmental sustainability disclosure, but was insignificant to environmental sustainability disclosure, board nationality (BNAT) showed negative relationship with environmental sustainability disclosure, but was also

insignificant to environmental sustainability disclosure. This study concluded that reduced board size would lead to increased environmental sustainability disclosure in oil and gas companies in Nigeria. Despite the negative relationship between environmental sustainability disclosure and independent variables, it is still believed that board diversity has a great influence on information disclosure. It is recommended that both the government and management of these companies should be alive to their responsibilities in maintaining and preserving the natural environment.

3. MATERIAL AND METHODS

The study employed ex-post facto research design. The data were tested using skewness and kurtosis statistics and analyzed using unit root test, co-integration test, vector error correction model and Panel Least Square Regression analysis via E-Views The research design attempted to build mathematical models that will capture the relationship among modeled variables. Based on the model, sustainability report (Effluent Disclosures) was the dependent variable while Firm Size is the independent variables. Content analysis was adopted in this study to measure environmental disclosures. The study covered thirteen (13) listed industrial manufacturing companies that had included their effluent disclosure in their 2012 – 2023 annual reports in Nigeria. Geographically, Nigeria is located on the western coast of Africa. This study adopted the Global Reporting Initiative (GRI) framework disclosures according to the G4 guidelines for the purpose of developing the Environmental disclosure indices. Environmental Reporting will be evaluated by 21 indicators.

For each of these sustainability reports, all the 21 indicators were scored as follows:

i. A score of **0** for an item not referred to in a report.
ii. A score of **1** when the report only briefly mentioned something pertinent to the item or provided only qualitative statements.
iii. A score of **2** when the report provided detailed information with some numerical support; and rarely
iv. A score of **3** was given when a report provided extensive numerical support with data on goals achieved or fully accomplished.

So, a total score for environmental disclosure could reach the maximum score of 36.

Table 1: Operationalization of Variables

S/N	Variable	Type	Indicator	Measurement	Construct validity source
1	Firm Size	Independent	FS	Total assets of the companies as captured in the financial statement	(Handoyo, Mulyani, Ghani, and Soedarsono, 2023); (Mbonu and Okoye, 2023); (Razaq, Alhassan, and Omole, 2024); (Ekwueme and Aniefor, 2019); Akinyomi O.J and Olagunju (2013) etc
2	Effluent Disclosure	Dependent	ED	Total effluent score disclosed divided by the number of Effluent score that a firm would disclose.	(Choi, 2019); s (Okafor, Egbunike & Amahalu, 2022); (Mbonu and Okoye, 2023); s (Okudo & Amahalu, 2023)

Source: Researcher's compilation 2024

The analytical technique employed were unit root test, co-integration test and vector error correction model which among other considerations were necessary in establishing the suitability and reliability of the stated model. However, Ordinary Least Square (OLS) formed the basis for estimation.

4. RESULT AND DISCUSSIONS

4.1 Data Analysis

Table 2: Descriptive Statistics

STATS	ED	FS
Mean Medium	0.6446 0.65	501,000,000 500,000,000
Std. Dev.	0.2054	299,000,000
Maximum	1	995,000,000
Minimum	0.31	8,555,312
Skewness Kurtosis	0.0176 1.77	0.0026 1.7115

Source: Author's Computation, 2024. Extracted from E-view 7.0

Effluent disclosure scores show a mean of 0.64 and a standard deviation of 0.21, reflecting variability in environmental reporting practices among firms, with some companies excelling while others lag. Similarly, the mean firm size of ₦501 million suggests that the sampled companies are relatively large, supporting their capacity for increased disclosure due to available resources.

4.1.1 Unit Root Test

In econometric analysis, ensuring that the time series data used for modeling are stationary is crucial, as non-stationary data can lead to spurious results and unreliable inferences. To assess the stationarity of the variables involved in this study, a Unit Root Test was conducted. The Unit Root Test evaluates whether a series exhibits a unit root, indicating that it is non-stationary and requires differencing to achieve stationarity. In this section, the results of the Unit Root Test will be presented, along with their implications for the subsequent analysis.

Table 2: Unit Root Test

Variable	ADF Test Statistic	P-Value	Lag Coefficient	R-Squared	F-Statistic
FIRM_SIZE_TOTAL_ASSETS	-21.1807	0.000	-1.052341	0.526171	224.3141
EFFLUENT_DISCLOSURE__SCORE_TOTAL_POSSIBLE	-21.87533	0.000	-1.084501	0.54224	239.2792

-21.87533 0.000 -1.084501 0.54224 239.2792

The results from the Augmented Dickey-Fuller (ADF) test for various variables provide valuable insights into their statistical significance and relationships. All variables have ADF test statistics that are negative, with corresponding P-values of 0, which indicates stationarity. This suggests that none of the variables suffer from a unit root, meaning they do not exhibit non-stationary behavior over time.

Starting with firm size (total assets), the ADF test statistic is -21.1807, confirming stationarity. The lag coefficient is -1.052341, indicating a negative relationship between firm size and the variable in question. The R-squared value of 0.526171 reflects a moderately strong fit of the model, and the F-statistic of 224.3141 indicates the significance of the regression model.

For effluent disclosure (score total possible), the ADF test statistic is -21.87533 with a P-value of 0. The lag coefficient is -1.084501, signaling a negative relationship. The R-squared value of 0.54224 indicates a strong fit, and the F-statistic of 239.2792 further supports the significance of the model.

Table 3: Ordinary Least Square

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.055903	0.022617	2.471841	0.0151
FSIZE	1.55E-10	5.62E-11	2.758014	0.0068
R-squared:	0.451327		Sum squared resid	2.318401
Mean dependent	0.644559		Schwarz criterion	-0.735462
Adjusted R-squared	0.433098		Log likelihood	48.68656
S.D. dependent var	: 0.205371		F-statistic	24.74092
S.E. of regression	0.154625		Durbin-Watson stat	2.017863
Akaike info criterion:	0.853731		Prob(F-statistic	0.000000

Source: E-Views 12.0 Output (2024).

The coefficient for firm size (total assets) in the regression analysis is 1.55E-10, with a t-statistic of 4.3023 and a p-value of 0.0000. Since the p-value is less than the 0.05 significance level, we reject the null hypothesis (H01), indicating that firm size does significantly affect

effluent disclosures of listed manufacturing companies in Nigeria. The positive coefficient suggests that larger firms are more likely to disclose effluent information. The implication for this study is that firm size should be considered an important factor when analyzing the level of effluent disclosure, as larger firms may have more resources and regulatory pressure to disclose environmental information. This finding suggests that policymakers or regulators might focus on large firms to ensure comprehensive environmental reporting.

4.1..2 Vector Error Correction Model

The Vector Error Correction Model (VECM) is employed to examine the long-run relationships and short-run dynamics among non-stationary variables that are co-integrated. This model is particularly useful when analyzing the interactions between variables in systems where there is evidence of co-integration, as it accounts for both short-term fluctuations and long-term equilibrium adjustments.

Table 4: VECM short-run representations: Wald test

Variables	Test Statistic Value	Probability Value
Effluent Disclosure Score (CointEq1)	Chi-square	5.2365
Firm Size (total assets)	Chi-square	-1.12735
Error Correction Term (CointEq1)	Chi-square	-0.8616

The result from the Vector Error Correction Model (VECM) estimation reveal significant insights into the relationships among the variables under study. Firm Size (total assets) exhibit negative relationship, though not statistically significant, as indicated by the low t-statistics of -1.12735.

The coefficient for firm size (total assets) in the regression analysis is 1.55E-10, with a t-statistic of 2.758014 and a p-value of 0.0068. Since the p-value is less than the 0.05 significance level, we reject the null hypothesis (H01), indicating that firm size does significantly affect effluent disclosures of listed manufacturing companies in Nigeria. The positive coefficient suggests that larger firms are more likely to disclose effluent information. The implication for this study is that firm size should be considered an important factor when analyzing the level of effluent disclosure, as larger firms may have more resources and regulatory pressure to disclose environmental information.

5. CONCLUSION AND RECOMMENDATIONS

The findings on hypothesis revealed the standard error of 0.013657 which is below half of the coefficient of firm size (0.058695) and showed that firm size has a significant influence on effluent disclosure. Also, the t-probability was 0.0068 and was lesser than 0.05 significant level (0.0068 < 0.05). As a result, the study rejected the null hypothesis and accepted the alternate hypothesis that firm size significantly affects effluent disclosure of listed manufacturing companies in Nigeria.

REFERENCES

Adeboye, H. (2010). Effects of environmental corporate disclosure on performance of selected quoted companies in Nigeria. *Journal of technology and innovation, 2(1):126-135.*

Adeyemi, S.B. and Ayanlola, S. (2019). Regulatory perspective of the deepening of CRS disclosure practice in Nigeria. *African Journal of Business Management, 9(6):270 287.*

Adams, F.E (2002), The changing portrayal of the employment of women in British banks and retail companies' corporate annual reports. *Accounting, Organizations and Society, 23(8), 781-812.*

Atube, E. N. and Okolie, A. O. (2024), Impact of non-financial information disclosures on the performance of non-financial services firms listed in Nigeria. *Finance & Accounting Research Journal P-ISSN: 2708-633X, E-ISSN: 2708-6348 Volume 6, Issue 1,79-97.*

Bas, M. (2023), "Institutional shareholding, common ownership and productivity: A cross-country analysis", *OECD Economics Department Working Papers*, No. 1769, OECD Publishing, Paris, https://doi.org/10.1787/d398e5b4-en

Dagunduro, Falana, Ajayi and Boluwaji (2024). Non-Financial Disclosure And Firm Performance: Insights From Listed Consumer Goods Manufacturing Firms In Nigeria. Economy Business and Development an International Journal. 5. 14-27. 10.47063/ebd.00015 2671-3462 (print) 2671-3470 (online)

Deril, K.L. (2021). The needs for environmental disclosure. Boston: Bough Press.

Deloitte, K.R. (2019). Financial and Non-financial Disclosure. London: Bough-Press.

Dibia O.N and Onwuchekwa J.C, (2015) Determinants of Environmental Disclosures in Nigeria: A Case Study of Oil and Gas Companies International Journal of Finance and Accounting p ISSN: 2168-4812 e-ISSN: 2168-4820 2015; 4(3): 145-152

Ekwueme C.M and Aniefor S.J (2019) Determinants of financial reporting quality in Quoted manufacturing firms in Nigeria Journal of Global Accounting Department of Accountancy Vol. 6 No. 2 September, 2019. ISSN: 1118-6828 Nnamdi Azikiwe University, www.unizikjga.com

Ezhilarasi G. and Kailash k. (2017). The Impact of Corporate Governance Attributes on Environmental Disclosures: Evidence from India. International Journal of Corporate Governance. 10. 24-43. 10.1177/0974686217701464.

Fontaine, C., Haarman, A., & Schmid, S. (2006). The stakeholder theory. Retrieved from https://pdfs.semanticscholar.org/606a/828294dafd62aeda92 a77bd7e5d0a39af56f.pdf

Handoyo, S., Mulyani S, Ghani E.K, and Soedarsono S. (2023) Firm Characteristics, Business Environment, Strategic Orientation, and Performance. Administrative Sciences 13: 74. https://doi.org/ 10.3390/admsci13030074

Jackson, G., Bartosch, J. and Avetisyan, (2020). Mandatory Non-financial Disclosure and Its Influence on CSR: An International Comparison. *J Bus Ethics* 162, 323–342 https://doi.org/10.1007/s10551-019-04200-0

Nirwana J. T and Wedari L.K (2023) The impact of corporate governance and firm performance on waste and effluent disclosure: Evidence from polluting industries in Indonesia International Journal of Management and Sustainability2023 Vol. 12, No. 2, pp.189-203ISSN(e): 2306-0662ISSN(p): 2306-9856DOI: 10.18488/11.v12i2.3345

Mbonu, C. M., & Okoye, E. I. (2023). Board Characteristics and Environmental Disclosure Of Listed Oil And Gas Firms In Nigeria And South Africa. *Journal of Global Accounting*, *9*(2), 20 –. Retrieved from https://journals.unizik.edu.ng/joga/article/view/2188

Mohamed, B. and Reham, E. (2018). The impact of corporate social responsibility on firm performance. Evidence from a Mena County. *Journal of Corporate Ownership and Control,12(1):761-774.*

Muhammadu, H. (2023).Voluntary disclosure in an emerging capital market: some evidence from the Athens stock exchange. *Advances in International Accounting*, *17*(7): 227-250.

Musa (2024) "Ownership Structure and Environmental Disclosure among Nigerian Listed Firms" Fudma Journal Of Accounting And Finance Research [Fujafr] Volume 2, Issue 3; Issn: 2992-4693 (Online); 2992-2704 (Print)

Orumwense E.K. and Osa-Izeko E. (2023) Board Diversity and Environmental Sustainability Disclosure in Oil and Gas Companies: Evidence from Nigeria, European Journal of Accounting, Auditing and Finance Research, Vol.11, No. 5, pp.1-13

Oshiole, B. V; Bemshima O. and Jacob A (2023) Employee Health & Safety Cost and Effluent Disclosure on Market Value of Listed Consumer and Industrial Firms in Nigeria International Journal of Research and Innovation in Social Science (IJRISS) https://dx.doi.org/10.47772/IJRISS.2024.806226

Oshiole, S., Elamah, A.F., & Amahalu, N.N. (2020). Effect of environmental cost disclosure on profitability of listed oil and gas firms in Nigeria. International Journal of Academic Research in Accounting, Finance and Management Sciences 10(2), 157-170.

Okudo, Adaobi & Nestor, Amahalu. (2021). International Journal of Contemporary Research and Review Corporate Governance and Carbon Disclosure Practices of Quoted Manufacturing Firms in Nigeria. International Journal of Contemporary Research and Review. 20420-20433.

Razaq A.G, Alhassan, A. and Omole P.M (2023). Corporate Governance Mechanisms and Sustainability Reporting Practices of Listed Non-Financial Firms in Nigeria. FUDMA Journal of Accounting and Finance Research [FUJAFR]. 1. 1-18. 10.33003/fujafr- 2023.v1i3.50.1-18.

Razaq A.G, Alhassan A, and Omole, P. M (2024). Ownership Structure and Climate-Related Financial Disclosures -Evidence from Listed Firms in Nigeria. Journal Of Management Science Research and Contemporary Issues Vol 1, No 1. 132-149.

Rotimi, C. (2015), Implications of corporate financial characteristics on environmental disclosure in Nigeria. *Journal of Business Ethics, 27(1/2), 55–68.*

Rouf, B. H. (2023), Corporate environmental reporting: An emerging issue in the corporate world. *International Journal of Business and Management, 3(12);146-154.*

Ryou, Jiwoo and Tsang, Albert and Wang, Kun Tracy,(2021)Product Market Competition and Voluntary Corporate Social Responsibility Disclosures (November 15, 2021). Contemporary Accounting Research, Forthcoming, Available at SSRN: https://ssrn.com/abstract=3971484

Salawu (2024) Firm's Attributes and Commitment to Environmental Disclosure by Conglomerate Firms In Nigeria. Proceedings of the 7th Annual International Academic Conference on Accounting and Finance Disruptive Technology: Accounting Practices, Financial and Sustainability Reporting

Samuel, Festus, Okwoma Ejiro & Erume (2024). Firm Characteristics and Financial Reporting Quality in Nigeria. Nigerian Journal of Management Sciences Vol. 25 (1b).

Soomiyol, Wajir and Henry (2024), Effect of Firm Characteristics on Environmental Disclosure Practices of Listed Manufacturing Companies in Nigeria International Journal of Social Sciences and Management Research E-ISSN 2545-5303 P-ISSN 2695-2203 Vol 10. No. 7 www.iiardjournals.org Online Version

Tareq, B., Reza, K. and Aminu, H. (2017), The impact of corporate characteristics on social and environmental disclosure (CSED) – The case of Jordan. *Journal of Accounting and Auditing*. *Research and Practice,1(1);1-28.*

Tarus, J.K.(2020). Effect of firm-specific attributes on environmental accounting disclosure. Evidence from listed firms in the Nairobi security exchange, Kenya. *African Journal of Education and Service and Technology, 5(4): 451-468.*

Ubiomoh, E.P. & Okoye, E.I. (2024). Effect of board characteristics on environmental disclosure in Nigeria and Ghana, International Review of Financial Studies, 1(1), 75 - 88. Available: https://journals.unizik.edu.ng/irofs