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Sustainability Reporting And The Financial Performance Of Listed Industrial Goods Companies In Nigeria

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Abstract
The paper aims to examine the impact as well as the relationship between sustainability reporting and financial performance in Nigerian industrial goods companies. The ex-post facto research design was adopted for this study and the population of the study consisted of all listed industrial goods companies listed in the Nigerian Exchange group (NGX). Purposive sampling technique was employed in the selection of a sample size of 11 companies with their data collected from secondary sources for 2018 - 2022. Data were analyzed using the panel least square regression with the aid of E-views 12 statistical package. Legitimacy theory and stakeholders' theory were used in the study. The result showed that social dimension index and economic dimension index are negatively related with return on assets (ROA) and were non-significant. However, environmental dimension index and governance dimension index showed a positive but insignificant impact on financial performance of industrial goods companies Nigeria. Overall, the findings conclude that sustainability reporting may not necessarily translate into immediate financial performance. Based on the study's findings, it is recommended among others that management should focus on improving their corporate governance policies and environmentally friendly policies to enhance their performance.

Keywords: *sustainability reporting, Return on asset (ROA), Global reporting initiative*

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I. Introduction

Sustainability in recent times, has become an important issue for businesses worldwide as this is a reporting aspect that stakeholders use to understand an organisation's contribution to the society. The has been increased global awareness of sustainability reporting as this has become very important since it aims at assessing the impact of the activities of companies on the environment for increased transparency and accountability. A sustainability report has to do with non-financial issues relating to environment, social and governance. Organisations responds to these non-financial issues leans credibility to their good reputation, positive innovation, and, ultimately, profitability. The are sustainability parameters which are accepted worldwide as mandatory reporting requirements so as to enable companies to show their activities and how they account for things such as carbon emissions, for example, or corporate governance issues. Sustainability reporting is the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development. Sustainable accounting is also known as environmental or social accounting and it goes beyond traditional financial accounting by incorporating non-financial information related to a company's environmental, social, and governance (ESG) performance. Wagenhofer (2024) asserts that sustainability reporting is an instrument of transparency regulation intended to influence management decisions. It has to do with measuring and reporting the organization's impacts and reliance on the environment, society, and economy. These aspects of performance shown by sustainable accounting provide a more comprehensive view of an organization's overall value creation and long-term sustainability by capturing and quantifying the organizations impact. This is evident in companies taking their environmental and social responsibilities seriously as well as striving to perform better financially. Company boards, executives, and management are investing more and more time and resources on issues of sustainability - such as carbon (greenhouse gas emissions), energy efficient technology, water use, clean tech, and biodiversity, among others. A global push towards sustainability practices has given rise to the need for companies to account for, and report on, sustainability - sometimes referred to as environmental, social, and governance (ESG) reporting.

Sustainability reports help to build public confidence and trust as it shows that the company prioritizes the environment and this reports are prepared in accordance with global reporting initiative (GRI). The GRI is an independent body charged with the duty of promoting guidelines for environment, social and governance issues. Sustainability reporting naturally covers Economic, social and governance (ESG) reporting, triple bottom-line reporting and corporate social responsibility (CSR) reporting.

In Nigeria today, organizations need to report their sustainability performance as prescribed by GRI. Regulators and stakeholders have called for transparency and efficient information on ESG performances of firms because of the effect of corporate organizations activities on the humans and environment alike (NSE 2019). According to Sousa Fiilho et al (2010), companies need to meet the demand from other stakeholders including employees, community, and environment as this goes beyond wealth maximization for shareholders. Companies contribute essentially to the overall performance of the economy in most nations across the world, particularly in developing economies. However, due to the hazardous effect of the materials used in the production of their goods, their actions majorly contribute to the hazards to human life but most companies are becoming environmentally sustainable. In light of these issues, this research seeks to examine the effects sustainability reporting on the financial performance of selected listed industrial goods companies in Nigeria.

Theoretical Framework

The concept of sustainability reporting for the purpose of this study will be anchored on two theories which are stake holder's theory and Legitimacy theory.

Stakeholder's theory

This is an organizational management theory propounded by Freeman (1983) which states that a firm's success is derived from the management of all associations related to company's business. This theory addresses the need for businesses to meet the needs of stakeholders beyond making profit. It gives backing to sustainability reporting because it presents the organizations interest to all stakeholders concerned and not just investors. Stakeholder's theory gives the backing for businesses to disclose their environmental and social responsibility (Naser et al, 2006) Sustainability reporting is part of the stakeholder theory, which makes the organization's interest not only to investors, but to many stakeholders. Stakeholder support can be part of the running of the company, the expected sustainability reporting it can create a good relationship between the company and stakeholders and make a company better in the future and the company's financial performance will be achieved (Tarigan & Samuel, 2014).

Legitimacy theory

Legitimacy theory requires organizations to operate within what is acceptable in the society while they stay devoted to societal norms to hold their legitimate status (Deegan, 2019). It shows that a company in running its business entity meets social norms and has a social responsibility towards related parties so that the company's life runs well (Suchman, 1995). Legitimacy theory also shows that disclosure of sustainability reporting is not only for achieving personal benefits but also for awareness of social values. Shamil et al (2014) asserts that the disclosure of sustainability reporting enables a company to gain legitimacy thereby granting it acceptance by the community. This will in turn give the company a positive image and is considered good by stakeholders so that the company's survival will be even longer (Imam & Sekar, 2014). Companies are expected to carry out sustainable accounting in line with societal norms and rules so as to garner continues support for their business operations.

Conceptual Framework

Sustainability reporting

Sustainability reporting as opined by Junior et al (2013) is a tool that is used by businesses to disclose their operations' via economic, social, and environmental issues while showing the implications to various stakeholders. through sustainability reporting, firms can display the relevant information related to economic, social and environmental issues thereby leading stakeholders carry out an assessment of the company so as to ascertain the impact on itheir overall performance. The recent calls for organizations to present sustainable report has led to increased demand for better corporate governance. Companies therefore need to show more accountability towards all stakeholders, that is, the environment and societies in which they operate. (Ngorima, 2019). Sustainability reports helps to build trust and public confidence as it shows that the company prioritizes the environment. As sustainability accounting continues to develop, companies continue to gain understanding of the scenery of reporting frameworks, standards and guidelines that may affect the form and content of their reports.

Sustainability reporting provides information about impacts of environmental, social, and governance topics and thus on financial risks and opportunities, which are often long-term. These impacts need to be

considered in financial accounting and disclosure. In particular, financial accounting incorporates many assumptions made about the future, which are aggregated into measurement. Sustainability reporting naturally covers environment social and governance (ESG) reporting, triple bottom-line reporting and corporate social responsibility (CSR) reporting. Sousa Filho et al (2010) asserts that companies need to meet the demands from other stakeholders including employees, community and environment which goes beyond wealth maximization for the shareholder. Sustainability reporting is used as a measure to improve a forms performance and present financial results while equipping stakeholders with the information about the going concern status of the business. (Johari & Komathy, 2019).

Regulators and stakeholders have called for transparency and efficient information on ESG performances of firms because of the effect of the corporate organizations activities on the humans and environment alike (NSE 2019).

Objectives of Sustainability Accounting

i. Measure and Monitor Sustainability Performance: Sustainable accounting practices aim to capture and measure the environmental, social, and governance (ESG) impacts of an organization. This is achieved by quantifying these ESG factors to allow for assessment of the performance of organizations and track their progress over time.
ii. Support Decision-Making: Sustainable accounting practices provide relevant information and insights to support informed decision-making. Financial reports and analysis that capture sustainable output helps organizations to make responsible decisions so as to balance financial, environmental, and social considerations
iii. Enhance Transparency and Accountability: Sustainable accounting practices promote transparency as they avail stakeholders with accurate and reliable information on an organization's sustainability performance. This transparency brings about accountability, allowing stakeholders to hold organizations responsible for their environmental and social impacts.
iv. Align with Global Sustainability Goals: Organizations use sustainability accounting practices to align their strategies and actions with global sustainability goals, such as the United Nations Sustainable Development Goals (SDGs) as this allows for contribution to the broader global agenda for a more sustainable and equitable future.
v. Attract Investors and Stakeholders: Sustainable accounting practices can enhance an organization's attractiveness to responsible investors and stakeholders. By demonstrating a commitment to sustainability and providing transparent reporting, organizations can attract investment, secure partnerships, and build strong relationships with stakeholders.

Importance of Sustainability Reporting

Sustainable accounting and reporting enhance transparency and accountability providing clear and reliable information about a company's ESG performance and this allows stakeholders to make informed decisions, fostering trust and strengthening relationships with investors, customers, employees, and the wider community (GRI, 2002). Sustainable accounting plays a crucial role in preventing and addressing greenwashing by promoting transparency, accountability, and accurate reporting of environmental and social performance. It promotes well-established reporting frameworks like Global Reporting Initiative (GRI) which encourages companies to provide accurate and comprehensive information.

Sustainability reporting helps sharpen management's ability to assess the organization's contribution to natural, human, and social capital. This assessment enlarges the perspective provided by conventional financial accounts to create a more complete picture of long-term prospects. Reporting helps highlight the societal and ecological contributions of the organization and the "sustainability value proposition" of its products and services. Such measurement is central to maintaining and strengthening the "license to operate".

Global Reporting Initiative (GRI)

The Global Reporting Initiative (GRI) is an international institution charged with the duty of establishing guidelines for the publishing of non-financial information regarding sustainable development (GRI, 2002). The GRI Standards represent global best practice for reporting publicly on a range of economic, environmental and social impacts. Sustainability reporting based on the Standards provides information about an organization's positive or negative contributions to sustainable development. The GRI Standards is a modular system of interconnected standards. Three series of Standards support the reporting process: the GRI Universal Standards, which apply to all organizations; the GRI Sector Standards, applicable to specific sectors; and the GRI Topic Standards, each listing disclosures relevant to a particular topic. Using these Standards to determine what topics are material (relevant) helps organizations to achieve sustainable development.

The GRI Guidelines organize "sustainability reporting" in terms of economic, environmental, and social performance (also known as the "triple bottom line"). This structure has been chosen because it reflects what the most widely accepted approach to defining sustainability is currently. GRI recognizes that, like any simplification of a complex challenge, this definition has its limitations. Achieving sustainability requires balancing the complex relationships between current economic, environmental, and social needs in a manner that does not compromise future needs. Defining sustainability in terms of three separate elements (economic, environmental, and social) can sometimes lead to thinking about each element in isolation rather than in an integrated manner. Nonetheless, the triple bottom line is a starting point that is comprehensible to many, and has achieved a degree of consensus as a reasonable entry point into a complex issue. Looking ahead, GRI is committed to continually improving the structure and content of the Guidelines in line with the evolving consensus on how to best measure performance against the goal of sustainable development. (GRI, 2002)

The GRI guidelines are chosen as they are the most popular standard of sustainability reporting with a vision to include non-financial information in the decision making of organizations. The GRI Standards enable organizations to report information about the most significant impacts of their activities and business relationships on the economy, environment, and people, including impacts on their human rights.

Indicators in the GRI Framework

GRI structures performance indicators according to a hierarchy of category, aspect, and indicator. The definitions used by GRI within this hierarchy are aligned with international standards, but adapted to the GRI framework. Indicators are grouped in terms of the three dimensions of the conventional definition of sustainability—economic, environmental, and social.

	Category	Aspect
Economic	Direct Economic Impacts	Customers Suppliers Employees Providers of capital Public sector
Environmental	Environmental	Materials Energy Water Biodiversity Emissions, effluents, and waste Suppliers Products and services Compliance Transport Overall
Social	Overall Labour Practices and Decent Work	Employment Labour/management relations Health and safety Training and education Diversity and opportunity
	Human Rights	Strategy and management Non-discrimination Freedom of association and collective bargaining Child labour Forced and compulsory labour Disciplinary practices Security practices Indigenous rights
	Society	Community Bribery and corruption Political contributions Competition and pricing
	Product Responsibility	Customer health and safety Products and services Advertising Respect for privacy

(Source – GRI Sustainability Reporting Guidelines 2002)

Performance Indicators

GRI has spelled out some performance indicators that reporting organizations that wish to report should present their reports in line with the Guidelines concerning the requirements for reporting. The performance indicators are grouped under three sections covering the economic, environmental, and social dimensions of sustainability. This grouping is based on the conventional model of sustainable development and is intended to aid users of the Guidelines.

However, there is a fourth indicator which has become necessary given the unique relationship of each organization to the economic, environmental, and social systems within which it operates and this is known as the integrated indicator. GRI has not identified a standardized set of integrated performance indicators. However, GRI encourages reporting organizations to consult with stakeholders and develop an appropriate shortlist of integrated performance indicators to include in their reports.

Integrated indicator measures are usually two: systemic and cross-cutting indicators

Systemic indicators provide an understanding of the degree to which the organization's performance may influence the performance of a larger economic, environmental, or social system. Systemic indicators provide an understanding of the degree to which the organization's performance may influence the performance of a larger system. These types of measures are most useful for organizations that operate within a relatively narrowly defined geographic area.

Cross-cutting indicators directly relate two or more dimensions of economic, environmental, and social performance as a ratio. Eco-efficiency measures (e.g., the amount of emissions per unit of output or per monetary unit of turnover) are the best-known examples.

Economic Performance Indicators: The economic dimension of sustainability concerns an organization's impacts on the economic circumstances of its stakeholders and on economic systems at the local, national and global levels. Economic impacts can be divided into: direct impacts; and indirect impacts. These impacts can be positive or negative. Broadly speaking, economic performance encompasses all aspects of the organization's economic interactions, including the traditional measures used in financial accounting, as well as intangible assets that do not systematically appear in financial statements.

Environmental Performance Indicators

The environmental dimension of sustainability concerns an organization's impacts on living and non-living natural systems, including ecosystems, land, air and water. The environmental dimension of sustainability has achieved the highest level of consensus among the three dimensions of sustainability reporting. It is particularly important to provide environmental performance information in terms of both absolute figures and normalized measures (e.g., resource use per unit of output). Both measures reflect important, but distinct, aspects of sustainability. Absolute figures provide a sense of scale or magnitude of the use or impact, which allows the user to consider performance in the context of larger systems.

Social Performance Indicators: The social dimension of sustainability concerns an organization's impacts on the social systems within which it operates. Social performance can be gauged through an analysis of the organization's impacts on stakeholders at the local, national, and global levels. In some cases, social indicators influence the organization's intangible assets, such as its human capital and reputation. Social performance measurement enjoys less of a consensus than environmental performance measurement. Through its consultative process, GRI has selected indicators by identifying key performance aspects surrounding labor practices, human rights, and broader issues affecting consumers, community, and other stakeholders in society

Financial Performance

The financial performance of any firm is a construct that shows the extent to which financial objective has been implemented. The performance of any business is critical to management, as it determines the survival or otherwise of any organisation (Richard et al., 2009; Taouab & Issor, 2019). Margolis and Walsh (2001) argue that financial performance acts as a measure of the results of companies processes and output in monetary terms. Financial performance provides guidelines that aid future deliberations and decisions that affect business development and managerial control (Tehrani & Rahnama, 2006). Financial performance is often measured using various financial ratios. For the purpose of this study, the Return on asset (ROA) is used as a measure for financial performance.

Return on asset. This is used as a measure of corporate financial performance and it is a profitability ratio that is used to measure the operating success or income of a company. Return on asset indicates how profitable a business is in relation to its assets. It provides an indication as to resourceful management in generating earnings (Investopedia, 2016; Asuquo, Effiong & Tieiseh, 2012). The formula of ROA: ROA= Net Profit/Total asset * 100.

Empirical review

Nnamani, Onyekwelu and Ugwu (2017) examined the effect of sustainability accounting on the financial performance of listed manufacturing firms in Nigeria. Three listed and major brewery firms were used for the study and were chosen from the Nigerian brewery sector. The ex-post facto research design was adopted for this study and secondary data was used to examine the relationship between sustainability accounting and the financial performance of the brewery firms in Nigeria. The data spanning a period of five years (2010-2014) were garnered from the Nigerian brewery industry. The companies used were Guinness Nigeria Plc, Champion Breweries Plc

and Nigeria Breweries Plc making up the sample size. The choice of the three firms was because of their domination of the brewery sector over years and this was to ensure data availability for the covered period. Data were analyzed using the ordinary linear regression while legitimacy theory and stakeholders' theory were used in the study. The result revealed that sustainability reporting has positive and significant effect on financial performance of brewery firms under study. Also, Sanusi & Sanusi (2019) conducted a study to assess the environmental sustainability reporting practices in the manufacturing industry in Nigeria. The research objective was to evaluate and assess extent of environmental sustainability practices among publicly traded industrial companies in Nigeria and its impact on their financial performance of the companies studied. Using a descriptive analysis, content analysis, and inferential statistics, the researchers ran a panel data analysis covering a time span from 2010 to 2015 to analyze the data collected. Also surveys were used. The findings of the study showed that most manufacturing firms in Nigeria have low level disclosures on their environmental issues and revealed that environmental sustainability reporting had a positive impact on financial performance which was measured using earnings per share, revenue growth, and return on assets.

Asuquo et al. (2018) analyzed the effect of sustainability reporting on corporate performance of selected brewery firms in Nigeria. The ex-post facto research design was used by the authors. Data were extracted from the financial statements of three firms covering a five (5) year period from 2012 -2016. The return on asset was the dependent variable while the economic performance disclosure (ECN), environmental disclosure (ENV), and social performance disclosure (SOC) were used as proxies for the independent variable. Using content analysis data were extracted and analyzed using SPSS 20 to obtain a correlation relationship result between the variables. Findings from the study showed that all the variables had a negative correlation with ROA except SOC which had a weak and positive correlation with ROA. However, there was no significant effect of the three variables on ROA of the selected firms.

Oti et al. (2012) examined environmental costs and its implication on the returns on investment: an evaluation of selected manufacturing companies in Nigeria. Using return on investment and Fines, penalties and compensation as dependent variable proxies and Employee health and safety, waste management and community development as independent variables, the authors based their research on two selected manufacturing firms in Nigeria. Companies were chosen for this study because of the GRI qualification for inclusion and data were collected from the financial statements of these firms and interviews were conducted to capture vital information which is typically not seen on the financial statements. Findings from the study revealed that practical significance of sustainable corporate practice reduces the level of fines, penalties, compensations and litigations. Also, it revealed a significant difference between the return on investment of the environmentally responsible firms and those of environmentally irresponsible firms. And the investment in social and environmental responsibilities such as employee health and safely (EHS), waste management (WM) and community development (CD) are related to improved return on investment of the environmentally responsible firms

Oyedokun & Erinoso (2022) undertook a study to evaluate environmental conservation, sustainability and financial performance of listed oil and gas companies in Nigeria. The study made use of the ex-post facto design to examine eleven (11) sampled listed oil and gas companies for the period 2011 -2020. Return on asset (ROA), Return on equity (ROE) and profit after tax (PAT) were used as dependent variable proxies while environmental conservation and environmental sustainability were used as independent variable. Panel data regression was used to analyze the data collected from the financial statements of the listed companies on the Nigerian Exchange Group (NGX). Findings from the studies showed that environmental sustainability as a significant effect on return on asset while environmental conservation did not have a significant relationship with ROE and PAT but had a significant relationship with ROA.

Memed & Amir (2020) conducted a study to assess the impact of sustainability reporting on the performance of the mining sector in Indonesia for the period of 2012-2016. Twenty (20) firms were selected as sample specifically from the mining sector. Sustainability disclosure was evaluated through content analysis, while Tobin's Q, return on equity (ROE), and return on assets (ROA) were used as indicators of company performance. The statistical tool method for the study was the multiple regression analysis. The results of the study indicated that sustainability reporting did not have a significant effect on Tobin's Q, ROE, or ROE.

Ogiriki & Igo (2022) carried out a research to looked at the impact of sustainability reporting indicators on Net Profit Margin (NPM), Return on Asset (ROA), and Return on Equity (ROE). The ex-post facto design was used in the study using 68 listed companies as sample out of 168 non-financial companies listed on the Nigerian Stock Exchange. Secondary data were extracted from their yearly financial statements and the data was analyzed using the ordinary least squares (OLS) regression model. Findings from the study showed that Sustainability reporting indicators impacted positively but were not statistically significant on Return on Asset (ROA), Return on Equity (ROE) and Net Profit Margin (NPM) of non-financial companies in Nigeria.

Donatus et al. (2023) investigated the corporate sustainability practices and financial performance of listed non-financial companies in Nigeria. The study looked at the relationship between return on asset (ROA), Return on equity (ROE), Economic value added (EVA) and Tobin's Q as dependent variables and social,

environmental, governance, and ESG disclosure indexes as independent variables. The study used both longitudinal and ex-post facto study designs drawing from a population of 107 non-financial companies as of November 6, 2022; 77 companies were sampled from the Nigerian exchange group (NGX) while data was retrieved from the NGX database, websites of sampled companies, and annual report accordance with GRI and ESG sustainability disclosure criteria. Data was evaluated using descriptive and inferential statistics The findings from the study revealed that corporate sustainability disclosure has significant effect on return on asset, Tobin's Q, and return on equity of listed non-financial companies in Nigeria. Also, the study showed that corporate sustainability disclosure has no significant effect on the economic value added of listed non-financial companies in Nigeria.

Mansila et al (2024) carried out a study to evaluate if corporate sustainability reporting influence financial performance with evidence from Kenyan Listed Companies. Their study covered firms listed at the Nairobi Securities Exchange. Corporate sustainability reporting proxies were corporate governance, social, environmental, and economic pillars. The Global Reporting Initiative framework was employed to establish the corporate sustainability reporting scores the sustainability reporting index. Financial performance was measured by return on assets. The stakeholder theory, legitimacy and the tripled bottom-line theories were used to anchor the work. The population comprised of 67 listed companies in Kenya. Secondary data was collected from the company integrated reports, published accounts, and the accounts filed with the Nairobi Securities Exchange for the period 2011 to 2020. The cross-sectional correlational research design was adopted for the study. Correlation analysis was done to test and establish the direction of the relationship between the study variables and a regression analysis was used to test the hypotheses of the study. The findings revealed that corporate sustainability reporting had a significant positive effect on financial performance.

Oti & Mbu-ogar (2018) conducted an analysis of environmental and social disclosure and financial performance of selected quoted oil and gas companies in Nigeria for the period 2012-2016. Time series data for five years were collected and analyzed using the ordinary least square regression technique. The stakeholder and legitimacy theories were the anchor of the work. Return on capital employed (ROCE) was used to measure financial performance while employee health and safety (EHS), waste management (WM) and community development (CD) were used to measure environmental and social disclosure. Findings from the statistical analysis result revealed that disclosure on employee health and safety and community development do not significantly affect financial performance while disclosure on waste management had a positive and significant effect on firm's financial performance.

Ibrahim et al. (2021) conducted a study to examine the effect of environmental reporting on financial performance of listed Nigerian industrial and consumer goods firms for the period span of ten (10) years from 2012 to 2021. Secondary data were extracted from the firm's annual reports using environmental reporting Index (ISO 14031) content analysis. In relation to financial performance the data was also collected from the firm's annual reports. The STATA 13 statistical software was used to analyze the study variables. The regression result revealed that environmental information has significant positive effect on return on asset (ROA); employee health and safety & product safety both had negative significant effects on ROA. Based on these findings, this study therefore, concludes that environmental reporting influence financial performance of listed industrial and consumer goods firms in Nigeria.

II. Methodology

The ex-post facto research design was employed for this study. The purpose of this design is to evaluate the effect of sustainability reporting on the return on assets of listed industrial goods companies in Nigeria and the design allows for the use of existing data without any artificial manipulation of variables. The population of the study consist of all listed industrial goods companies listed in the Nigerian Exchange group (NGX). Purposive sampling technique was employed in the selection of a sample size of 10 companies. Data were collected from secondary sources (published annual reports for 2018 - 2022). In line with the Global Reporting Index (GRI) G4 guidelines, the environmental disclosure index (ENDI), social disclosure index (SDI), governance Disclosure index (GDI) and economic disclosure index (EDI) was adopted from the work of Donatus et al. (2023). Data on return on asset (ROA) was collected from the sample companies published financial statements documented in the Nigerian Exchange group (NGX) for the period 2018 – 2022. The collected data was analysed using descriptive and inferential methods using E-views 12.

Model specification

The multiple regression equation used to explain the relationship between the variables is expressed below:

$Y = \beta + \beta_x + \mu_1$ - - - - - - - - - - (1)

Where Y = financial performance

X = sustainability Reporting

β = coefficient of sustainability reporting

μ = error term
equation (1) can be re-stated as follows
$ROA = \beta0 + \beta_1 ENDI + \beta_2 SDI + \beta_3 GDI + \beta_4 EDI\ \mu_1 t$ ………..i
Where ROA = Return on asset
ENDI = Environmental disclosure index
SDI = social disclosure index
GDI = Governance disclosure index
EDI = Economic disclosure index
$\beta_1 - \beta_4$ = independent variables coefficients
t = period (2018 - 2022)
μ = error term
Apriori expectation = $\beta_1 - \beta_4 > 0$

III. Results

Descriptive statistics

Before trying to model and forecast a given time series, it is important to have a preliminary look at the data so as to identify its main properties. The summary of descriptive statistics is the most important tool used for describing the data. The descriptive analysis of the variables use for econometrics analysis by the researcher is presented in table 1. The table is but a summary of the result of the analysis done using the EViews 12.0 econometric software.

Table 1: Descriptive Analysis of Variables

	ROA	ENDI	SDI	GDI	EDI
Mean	-0.99509	0.25598	0.37836	0.39345	0.33418
Median	3.59000	0.00000	0.29000	0.42000	0.22000
Maximum	108.900	1.00000	0.86000	0.83000	0.84000
Minimum	-179.920	0.00000	0.00000	0.00000	0.00000
Std. Dev.	37.4805	0.35000	0.21285	0.25973	0.24661
Observations	55	55	55	55	55

Table 1 shows the mean value of return on asset (ROA) in the period to be -0.99509, this implies that the returns on the assets of the selected companies were negative during the period. The mean value of environmental disclosure index (ENDI) was 0.25509 the range for ENDI was 0.0000 to 1.00000 with a standard deviation of 0.35000. Similarly, social disclosure index (SDI) ranges from 0.00000 to 0.86000 with a mean and standard deviation of 0.37836 and 0.21285 respectively. Furthermore, the value of governance disclosure index (GDI) has its minimum value as 0.00000 with its maximum value of 0.83000. The mean value stood at 0.39345 and deviation from its mean was 0.25973. Lastly, economic disclosure index (EDI) has a mean value of 0.33418 and a standard deviation of 0.24661.

Correlation test

The correlation coefficients show that none of the independent variables are highly correlated with each other and there is no evidence of multicollinearity as no correlation coefficient exceeds the threshold of 0.80. This will ease the problem of serial correlation.

Table 2: Correlation Analysis

	ROA	ENDI	SDI	GDI	EDI
ROA	1.0000	0.1443	0.1269	0.1525	0.1457
ENDI	0.1443	1.0000	0.7213	0.6312	0.0994
SDI	0.1269	0.7213	1.0000	0.5828	0.0852
GDI	0.1525	0.6312	0.5828	1.0000	0.4210
EDI	0.1457	0.0994	0.0852	0.4210	1.0000

Furthermore, it is observed that the sustainability indices (environmental dimension index, social dimension index, governance dimension index and economic dimension index) were highly and positively correlated with return on asset for Nigerian listed industrial companies. A closer examination of the correlation results revealed that sustainability reporting is positively related with financial performance.

Stability test

To determine the stability of the system, an Autoregressive (AR) unit root test was conducted to test for the stability of the model. According to the autoregressive unit root test, the inverse roots of the AR characteristics

polynomial of the model, take place within the unit circle. Accordingly, if all AR inverse roots are within the unit circle, the system is either stable or steady; if at least one of them is on or outside the unit circle, the system cannot be stable (Koyunce, 2014).

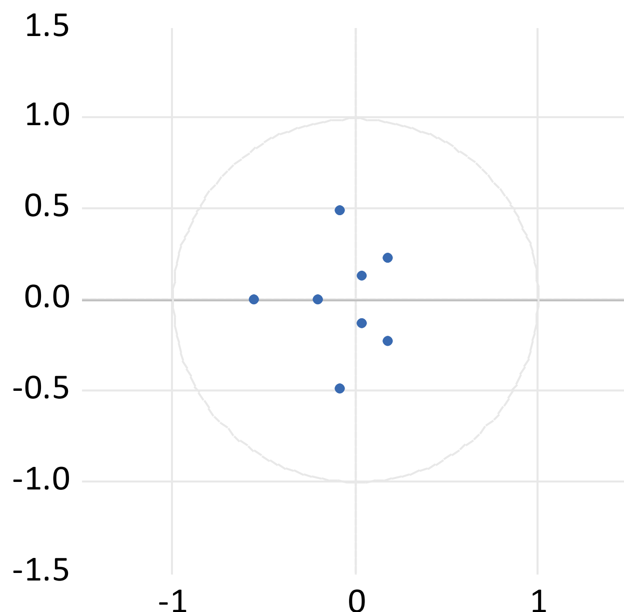

Fig 1: AR root graph

For the AR roots graph, an estimated model is stable if all roots have modules less than one and lie inside the unit circle. The result AR unit root test presented above showed that all the inverse roots are within the unit circle, implying that the VAR model meets stability conditions.

Lag order selection

As statistically established, it is important to determine the lag length for the model as it can have a significant impact on the accuracy, interpretability, and reliability of the results.

Table 3: VAR lag order selection criteria

Lag formation	FPE	AIC	SC	HQ
0	2.68e-07	-3.779416	-3.598021	-3.718382
1	9.21e-08	-4.858202	-3.951228	-4.553033
2	4.62e-08*	-5.596297*	-3.963743*	-5.046992*

The lag order selection of two lags is adequate, which are chosen by the model at a 5% level based on Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan Quinn information criterion (HQ), indicating that VAR (2) specification is the estimation model and the plausible description of the data used. However, the Schwarz information criterion (SC) is chosen with the lowest lag value.

Endogenous graph

The endogenous graphs depicted in Fig 2 shows the behavior of each independent variables and how the listed companies respond to changes in return on assets during the period.

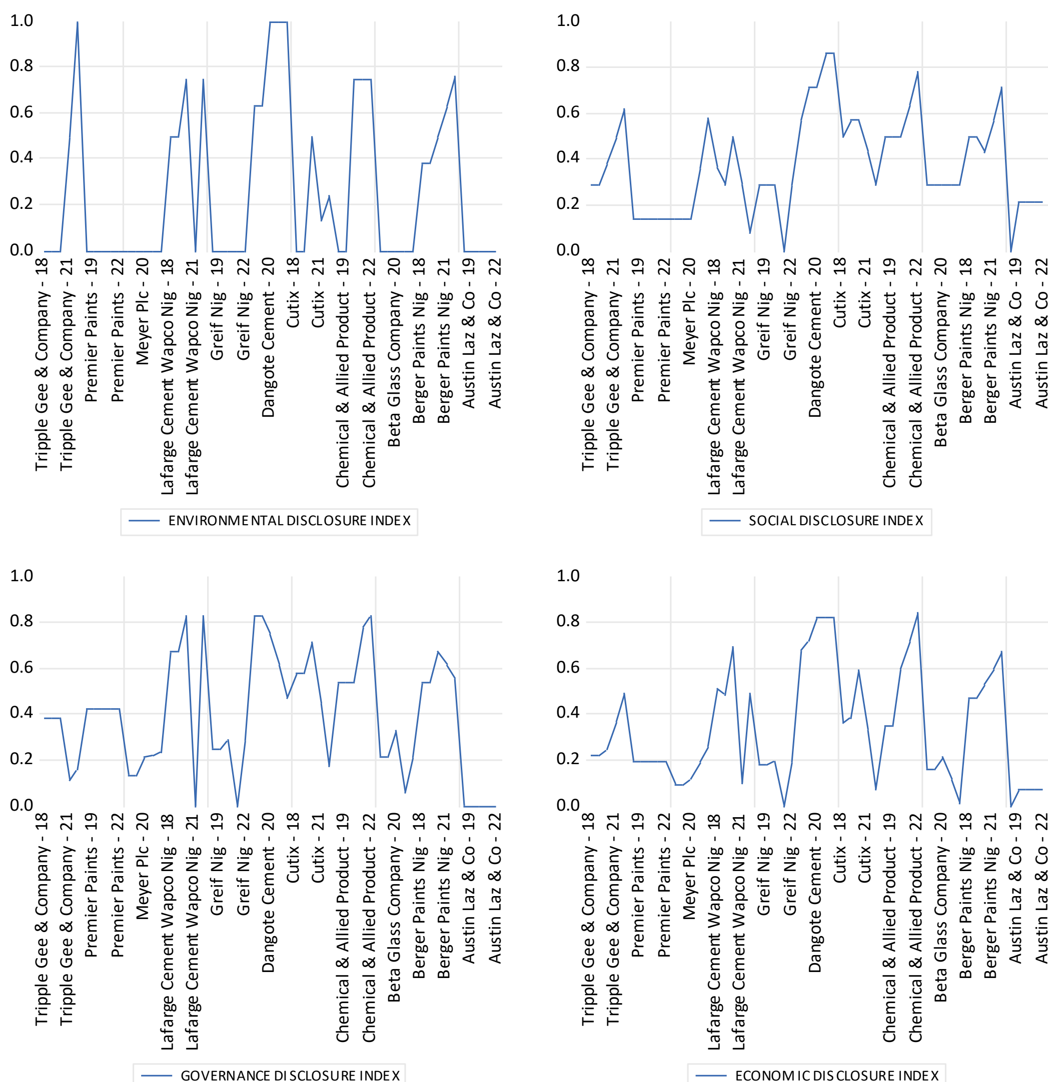

Fig 2: Endogenous graph

The environmental disclosure index for five Nigerian companies - Triple Gee, Lafarge, Dangote, Cutix, and Berger Paint - exhibited an unpredictable trend over time. In contrast, Premier Paint, Meyers, Grief, Chemical Allied Products, and Austin Laz showed more consistent environmental disclosure patterns. Meanwhile, the social disclosure index suggested that only Premier Paint demonstrated stability throughout the period. When looking ahead, neither the governance disclosure nor economic disclosure indices showed a stable trend for any of the companies. Thus, the findings indicate that inconsistent governance and economic policies have hindered the enhancement of return on assets over time.

Normality test

The VAR normality test is performed to determine the distribution of the variables. It employs the Jacque Bera residual normality test testing with the null hypothesis that the residuals are normally distributed and the alternative hypothesis that the residuals are not normally distributed.

Table 4: Normality Test

Component	Skewness	Chi-Sq.	d.f.	Prob.
1	0.273705	0.412029	1	0.5209
2	-0.052399	0.015101	1	0.9022
3	-0.005250	0.000152	1	0.9902
4	-0.250084	0.343981	1	0.5575
Joint		0.771262	4	0.9423
Component	**Kurtosis**	**Chi-Sq.**	**d.f.**	**Prob.**

1	3.213576	0.062720	1	0.8022
2	4.860494	4.759478	1	0.0291
3	2.877363	0.020680	1	0.8857
4	3.734345	0.741486	1	0.3892
Joint		5.584364	4	0.2324

Component	Jarque-Bera	df	Prob,
1	0.474749	2	0.7887
2	4.774579	2	0.0919
3	0.020832	2	0.9896
4	1.085467	2	0.5812
Joint	6.355626	8	0.6075

Bearing the residuals of the components and their P-values, it is concluded that they are normally distributed since they are generally not significant or more than 0.5%

Panel regression output

The study utilized the Hausman test to identify the most suitable model, and the results showed that the Chi-square test yielded a value of 3.3698 with a statistically insignificant probability value of 0.4979, which rejects the null hypothesis in favour of the Random effects model.

The panel least squares (random effect) model outcome indicated that the intercept value was 20.3997, indicating that return on asset (ROA) would experience a twenty percent increase when all other variables (ENDI, SDI, GDI, and EDI) are held constant. The estimated coefficients for environmental disclosure index and governance disclosure index exhibited positive but statistically insignificant effects with values of 30.1704 and 27.2494, respectively. This implies that a unit increase in both ENDI and GDI will be associated with a corresponding percentage increase in return on asset (ROA). Conversely, the coefficients estimated for social disclosure index and economic disclosure index were -8.4200 and -109.60, respectively, indicating a negative impact on return on assets. This suggests that a percentage change in SDI and EDI will lead to a corresponding percentage decrease in return on asset (ROA). Statistically, the individual variables were found to be insignificant at the 5% level of significance.

Table 5: Panel Least Square - Random Effect

Correlated Random Effects - Hausman Test				
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.		Prob.
Cross-section random	3.369880	4		0.4979
Dependent Variable: ROA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	20.39976	24.40133	0.836010	0.4087
ENDI	30.17044	63.96286	0.471687	0.6400
SDI	-8.420045	98.96726	-0.085079	0.9327
GDI	27.24948	82.87372	0.328807	0.7442
EDI	-109.6010	192.4957	-0.569368	0.5726
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.388889	F-statistic		1.27274
Adjusted R-squared	0.083337	Durbin-Watson stat		3.12647

Furthermore, the R^2 {R-Squared} which measures the overall goodness of fit of the entire regression, had a value of 0.38888 which showed that the predictive power of the model is weak. The Durbin-Watson statistic deduced that there is presence of autocorrelation among the successive values of the variables in the model as the value exceed the acceptable threshold of 0-2. Lastly, the F-statistics revealed that the model is statistically insignificant with its probability value greater than the 5% region. Thus, sustainability reporting has an insignificant impact on financial performance in Nigerian industrial goods companies.

IV. Discussion

The correlation findings suggested that, in the Nigerian industrial goods companies, the sustainability reporting indices have not significantly impacted with return on assets (ROA). However, the correlation result

showed that the indices are positively correlated with return on assets (ROA). This finding is in agreement with Ogiriki & Igo (2022) who found that sustainability reporting indicators impacted positively but were not statistically significant on return on asset (ROA) of non-manufacturing companies in Nigeria.

From the panel regression output, the environmental dimension index showed a positive but insignificant impact on ROA. The insignificant result between environmental dimension index and ROA is consistent with Mansila et al (2024) who found no significant relationship between environmental disclosure and financial performance. This could be due to lack of environment awareness and initiatives in sustainability reporting. On the other hand, the panel result for governance dimension index exhibited a positive but insignificant impact on ROA. This suggested that good corporate governance practices may have a positive impact on a company's financial performance. The insignificant result is in disagreement with Donatus et al. (2023) that found a significant impact of corporate governance report and financial performance.

Further, a negative impact was found between social and economic dimension index on ROA. This is against our expected outcome of the study as one would expect that companies that prioritize economic and social responsibility would have better financial performance. These findings are also in disagreement with Ogiriki & Igo (2022). Overall, the study found that all variables were statistically insignificant at the 5% level of significance suggesting that there may be other sustainability factors that are more important determinants of a company's financial performance. This is consistent with previous studies such as Oti & Mbu-ogar (2018); Ogiriki & Igo (2022); and Donatus et al. (2023).

V. Conclusion

This study examined the relationship between sustainability reporting and financial performance in Nigerian industrial goods companies. The result showed that social dimension index and economic dimension index are negatively related with return on assets (ROA) and were non-significantly. However, environmental dimension index and governance dimension index showed a positive but insignificant impact on financial performance of industrial goods companies Nigeria. The study's findings conclude that good corporate governance and healthy environmental practices may have a positive impact on a company's financial performance, while sustainability reporting may not necessarily translate into immediate financial performance.

Based on the study's findings, it is recommended that management should consider implementing the following policies and regulations:

1. Management should focus on improving their corporate governance policies including board composition, executive compensation, and internal controls to enhance their performance.
2. Nigerian industrial goods companies should promote environmentally friendly practices to improve their bottom-line performance.
3. Board of directors should ensure that measures are undertaken by management to combat economic upheavals and swings in the macroeconomic space.
4. Regulatory bodies should encourage compliance to social corporate responsibilities that will contribute to human capital development and in turn enhance financial overall performance.

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