



Effect Of Profitability Metrics on Sustainability Reporting: A Sectorial Analysis in Emerging Market Industries

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Abstract

This study investigated the relationship between profitability metrics and sustainability reporting in emerging market industries, focusing on environmental, social, and governance disclosures. With growing pressure for companies to improve their sustainability practices, understanding the impact of financial performance on these disclosures is critical. The study used a panel dataset of 33 firms from emerging markets to analyze the effects of key profitability metrics, Return on Assets, Return on Equity, Earnings Before Interest and Taxes, and Earnings per Share, on three types of sustainability disclosures: environmental sustainability disclosure, social responsibility disclosure sustainability index, and governance sustainability disclosure index. The results revealed that profitability metrics do not significantly affect: environmental sustainability disclosure, social responsibility disclosure sustainability index, and governance sustainability disclosure index. The findings highlight the complexity of sustainability reporting, where financial outcomes may not always directly correlate with disclosure practices. For policymakers, businesses, and investors, the study provides important insights into the dynamics of sustainability reporting in emerging markets, emphasizing the need for broader regulatory frameworks that encourage comprehensive disclosure practices.

Key Words: Profitability Metrics. Sustainability Reporting, Environmental Disclosures, Social Disclosures, Governance Disclosures.

Introduction

Sustainability reporting has become an essential practice for companies globally, especially in emerging markets, as it provides transparency on a firm's environmental, social, and governance (ESG) activities. With growing attention on sustainability, companies are expected to report on their environmental impacts, social responsibility, and corporate governance structures to maintain legitimacy, attract investment, and ensure long-term profitability (Olatunde, et al. 2021). In emerging markets, where corporate transparency and sustainable practices are evolving, understanding the impact of sustainability reporting on profitability is crucial.

Emerging market industries face unique challenges in balancing profitability with sustainability. Companies in these regions often grapple with resource constraints, regulatory complexities, and heightened pressure to meet both national and international sustainability standards (Khan, et al. 2021). Environmental sustainability reporting, for instance, addresses the need for companies to disclose their energy consumption, carbon emissions, and waste

management practices. Studies show that such disclosures can influence consumer perception, regulatory compliance, and operational efficiency, all of which may positively affect profitability (Ali, et al. 2018; Al-Waeli et al., 2021). However, the relationship between these disclosures and financial performance remains complex and industry-specific.

Similarly, social sustainability disclosures (SDI), including reporting on corporate social responsibility (CSR) initiatives, employee welfare, and community development, have been found to impact a company's public image and customer loyalty, which may, in turn, affect profitability (Emeke, et al. 2021; Busru, 2021). Governance sustainability disclosures (SDI), which cover corporate governance practices, risk management, and ethical standards, are also believed to influence profitability by enhancing transparency, reducing risks, and building trust with investors (Moses, 2021; Erin, et al. 2022).

Given these dynamics, this study seeks to investigate the effects of profitability metrics on sustainability reporting practices, specifically focusing on environmental, social, and governance disclosures in

emerging market industries. The study aims to assess how these reporting practices influence company profitability, providing insights into the broader relationship between sustainable business practices and financial performance in emerging markets.

Problem of the Study

In recent years, the importance of sustainability reporting has grown significantly, especially within emerging markets. These markets are characterized by rapid industrialization, resource constraints, and an increasing need for firms to balance financial performance with environmental and social responsibilities (Khan, et al. 2021). Despite the growing interest in sustainability, the relationship between sustainability reporting and profitability remains underexplored in these regions. While existing literature highlights the positive correlation between sustainability practices and corporate financial performance in developed markets (Ikumapayi, et al. 2018), studies focusing on emerging markets are scarce and often yield mixed results. This creates a critical gap in understanding how environmental, social, and governance (ESG) disclosures influence firm profitability in these regions.

Emerging markets are often grappling with weaker regulatory frameworks, which results in inconsistencies in the implementation and quality of sustainability reporting. As a result, it becomes essential to understand how environmental sustainability reporting, social sustainability disclosures (SDI), and governance sustainability disclosures (SDI) contribute to profitability metrics like Return on Assets (ROA), Return on Equity (ROE), Earnings Before Interest and Taxes (EBIT), and Earnings per Share (EPS) in these regions. Companies in emerging markets may face higher challenges in reporting sustainability factors due to resource limitations and lack of structured frameworks (Kundayo, et al.2020).

While sustainability reporting has been shown to improve stakeholder trust and brand image in developed economies, the extent to which these benefits translate into financial gains in emerging markets is still uncertain (Freeman, 1984; Ndanafu & Ojodi, 2023). This study, therefore, seeks to explore the relationship between sustainability reporting and profitability in emerging market industries, providing insights into the broader implications of sustainability practices for financial performance. Particularly, the following the null hypotheses will be used for the Study:

- i. **H₀₁:** There is no significant effect of profitability metrics on environmental sustainability reporting in emerging market industries.

- ii. **H₀₂:** There is no significant effect of the profitability metrics on the social sustainability disclosures (SDI) of companies in emerging markets.
- iii. **H₀₃:** There is no significant effect of the profitability metrics on Governance sustainability disclosures (SDI) of companies in emerging markets.

Conceptual Review

Sustainability Reporting in Emerging Markets

Emerging markets are characterized by rapid industrialization, resource scarcity, and underdeveloped regulatory frameworks (Nuhu & Alam, 2024). These markets face unique challenges, such as limited access to sustainable technologies, lack of standardized reporting practices, and inconsistent enforcement of environmental regulations. Despite these challenges, the importance of sustainability reporting in emerging markets has risen, as companies seek to attract international investment, improve their environmental practices, and align with global sustainability goals (Nzekwe, et al. 2021). The growth of global supply chains and increasing consumer demand for ethical practices has placed additional pressure on companies in these regions to report on their sustainability efforts (Bose & Khan, 2022).

The evolution of sustainability reporting standards has been pivotal in shaping the practices of companies worldwide. The Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) have developed frameworks that provide guidelines for companies to disclose their sustainability performance in a structured manner (A Practical Guide to Sustainability Reporting, 2013). These standards have facilitated greater consistency in reporting and have enabled companies to communicate their ESG performance effectively. In emerging markets, however, the adoption of these standards is often slow due to regulatory and infrastructure challenges (Adegboyegun, et al. 2020).

Environmental Sustainability Reporting and Profitability

Environmental sustainability reporting plays a critical role in shaping a company's financial performance. Companies that disclose their environmental impacts, such as carbon emissions, waste management, and resource usage, often experience improved financial performance due to enhanced stakeholder trust, regulatory compliance, and operational efficiency (Bose, et al. 2022; Al-Waeli, et al. 2021). Voluntary environmental disclosures can act as a signal to investors, signaling that the company is forward-thinking and prepared to manage environmental risks effectively (Friske, et al. 2023). Research indicates that

firms that adopt comprehensive environmental reporting practices often see better financial outcomes, such as improved stock performance and profitability, due to reduced operational costs and improved risk management (Igbinovia & Agbadua, 2023).

The impact of environmental disclosures on profitability is often industry-specific. For example, industries such as manufacturing and energy face higher scrutiny regarding their environmental practices due to their substantial ecological footprints (Emeke, et al, 2021). These industries are under significant pressure to report on their environmental practices and reduce their impact, which can present both challenges and opportunities. On the one hand, the need for regulatory compliance can drive up costs, but on the other hand, it creates opportunities for cost savings through efficiency improvements, innovative technologies, and access to green financing (Ali, et al. 2018; Nmer & Hass, 2021).

Exploring the Components of Social Sustainability Reporting

Social sustainability disclosures (SDI) encompass corporate social responsibility (CSR) initiatives, employee welfare programs, community engagement, and stakeholder relations (Emeke, et al. 2021; Sani, 2025). CSR reporting highlights how organizations contribute to societal development through charitable contributions, health and safety programs, and education support, while employee welfare disclosures communicate policies on training, fair wages, and work-life balance. These components provide a transparent framework for stakeholders to evaluate a company's commitment to social responsibility (Adegboyegun et al., 2020).

Transparent reporting of social sustainability activities strengthens stakeholder trust by demonstrating accountability and ethical business conduct (Whitt & Bournier, 2018). Firms that actively communicate social initiatives foster stronger brand loyalty, as customers, investors, and employees perceive them as socially responsible and ethical (Wilky & Cole, 2020). Studies show that positive stakeholder perceptions of social responsibility can translate into increased customer retention, higher employee engagement, and improved investor confidence (Suchman, 1995; Ali, et al. 2018; Omotola & Lambo, 2024).

Governance Sustainability Disclosures and Their Influence on Profitability

Governance sustainability disclosures encompass corporate governance structures, anti-corruption policies, and risk management practices that organizations communicate to stakeholders (Mohammed, 2018). These disclosures provide insight into board composition, internal control mechanisms,

compliance frameworks, and ethical guidelines that ensure accountability and mitigate operational and financial risks. Effective governance reporting reflects a company's commitment to regulatory compliance and sustainable business practices, which are particularly critical in emerging markets where institutional weaknesses and corruption risks are prevalent (Jyoti & Khanna, 2021; Nuhu, et al. 2024).

Transparent governance practices enhance operational efficiency and protect organizations from financial mismanagement and reputational damage (Friske, et al. 2023), while ethical governance also fosters internal trust among employees, reduces agency costs, and strengthens long-term strategic decision-making, which collectively contributes to sustained profitability (Omotola et al. 2024) as investors are more likely to commit capital to firms that provide clear, comprehensive governance reports, perceiving them as lower-risk and more likely to generate consistent returns. Consequently, robust governance sustainability disclosures play a critical role in enhancing both financial performance and market valuation in emerging economies.

Profitability Metrics in Emerging Market Industries

Profitability metrics such as Return on Assets (ROA), Return on Equity (ROE), Earnings Before Interest and Taxes (EBIT), and Earnings per Share (EPS) are critical indicators used to evaluate a company's financial health. ROA measures how efficiently a company uses its assets to generate profit, with higher values indicating better asset utilization (Freeman, 1984). ROE, on the other hand, gauges the profitability relative to shareholders' equity, signaling how effectively a company utilizes its equity base to generate earnings (Ali, et al. 2018). EBIT focuses on operational efficiency by excluding interest and taxes, providing a clearer view of a company's core profitability (Friske, et al. 2023). EPS, often a favorite among investors, measures the profit attributable to each share, offering insights into company performance from a shareholder's perspective (Al-Waeli, et al. 2021).

Profitability metrics are essential in assessing the financial health of a company, especially in emerging markets where companies face unique challenges such as fluctuating economic conditions and regulatory uncertainty (Bose, et al. 2022). These metrics help stakeholders, including investors and analysts, determine the sustainability and risk profile of a company. Strong profitability ratios can indicate a company's ability to weather economic volatility and sustain growth, which is crucial for long-term financial stability (Khan, et al. 2021; Ukaru & Onmani, 2024).

In emerging economies, there is a growing recognition of the relationship between profitability and sustainability. Companies that effectively integrate sustainability practices into their operations may experience enhanced profitability through improved efficiency, brand loyalty, and investor trust (Ali, et al., 2018; Kolawole, et al. 2023; Obinna & Onwe, 2024). Moreover, companies in these regions are increasingly using sustainability reporting to attract investors and comply with global standards, thus improving their financial outcomes (Nazim, et al. 2017; Oluwagbade, et al. 2023).

Theoretical Review

This study is grounded in several key theories that explain the relationship between sustainability reporting and profitability in emerging markets. The Stakeholder Theory (Freeman, 1984) posits that companies must consider the interests of all stakeholders, not just shareholders, and sustainability reporting helps build trust with various stakeholders, leading to improved financial performance. Signaling Theory (Spence, 1973) suggests that voluntary sustainability disclosures act as signals to the market, enhancing a company's reputation and investor confidence, which in turn influences profitability (Friske, et al. 2023). Resource-Based View (RBV) (Barney, 1991) also informs the study by highlighting how a company's internal resources, such as transparent governance and ethical practices, can provide a competitive advantage. Finally, Legitimacy Theory (Suchman, 1995) argues that companies disclose sustainability practices to gain legitimacy in society, which can enhance their market position and long-term profitability.

Empirical Review

Nzekwe et al. (2021) examined the impact of sustainability reporting on the financial performance of industrial goods companies in Nigeria from 2008 to 2019. Focusing on environmental, social, and economic reporting, the study analyzed data from eleven firms using purposive sampling. The results showed that each type of sustainability reporting positively influenced cash value added. The study recommended the adoption of stronger environmental policies and innovations to enhance financial performance. Panel data analysis methods, including regression and Granger causality tests, were used. Erin et al. (2022) explored the relationship between corporate governance and sustainability reporting quality among 120 listed firms in Nigeria. Governance was assessed using board variables (size, independence, gender diversity, expertise) and audit committee attributes (size, expertise, meeting frequency). Sustainability reporting quality was scored from 0 to 4,

with independent assurance receiving the highest score. The study, using ordered logistic regression, found significant links between governance variables and reporting quality, with external assurance enhancing this relationship. It highlighted implications for policymakers and managers, suggesting scope for cross-country research.

Friske et al. (2023) investigated the impact of voluntary sustainability reporting on firm value, using Tobin's Q as a measure. Analyzing panel data from reporting and non-reporting firms between 2011 and 2020, the study found that sustainability reporting initially had a negative relationship with Tobin's Q but became positive over time. The study, grounded in signaling theory, concluded that sustainability reporting, once seen as costly, enhanced firm value as investor understanding improved. External assurance was also found to positively impact Tobin's Q by increasing credibility.

Ferreira and Martins (2024) explored the relationship between integrated reporting and shareholder value creation in public companies across 39 countries between 2011 and 2018. Using propensity score matching, multilevel regressions, and difference-in-differences models, the study found that adopting integrated reporting enhanced shareholder value by reducing information asymmetry, improving stock price synchronicity, and increasing earnings predictability, especially in developed countries. The study concluded that the reporting process itself, rather than specific frameworks, drives value creation, positioning integrated reporting as a key tool for shareholder value.

Omotola et al. (2024) investigated the relationship between sustainability accounting, reporting, and public value creation in Nigeria's public sector. Data were collected via questionnaires from 2,730 respondents, including managers and senior personnel across Nigeria's six geo-political zones. Using Partial Least Squares Structural Equation Modeling (PLS-SEM), the study found a negative relationship between sustainability accounting and public value creation, highlighting the absence of mandatory sustainability reporting requirements. The study emphasized the need for stronger regulatory frameworks to foster sustainability practices in Nigeria's public sector.

Sani (2025) investigated the challenges and prospects of public value creation, sustainability accounting, and reporting in Nigeria's public sector. Through exploratory research, the study reviewed literature and published articles. Findings revealed key issues such as lack of political will, minimal citizen involvement, and insufficient skilled personnel, all of which hinder effective value creation and sustainability reporting. The study recommended stronger political commitment, increased citizen and stakeholder participation,

capacity building for public sector staff, and awareness campaigns on the benefits of sustainability practices and reporting.

Research Gaps

Despite increasing attention to sustainability reporting in emerging markets, several gaps persist in the literature. First, most studies emphasize environmental and social disclosures, with limited focus on governance sustainability disclosures and their direct effect on profitability in Nigerian firms. Second, while research links sustainability reporting to financial performance, empirical evidence on the interaction between governance practices, investor confidence, and long-term profitability in emerging economies remains sparse. Finally, the role of transparency and ethical practices as mediators between governance disclosures and firm performance has not been sufficiently explored, creating a need for context-specific studies in Nigerian listed companies to fill these gaps.

Research Methodology

Research Design and sample size

The study employed an ex-post facto research design to investigate sample units over a defined period, enabling the examination of changes, effects, and behavioral patterns over time. The population included 46 listed manufacturing companies on the Nigerian Exchange Group (NGX) as of December 2024, with a sample of 33 firms selected from sectors including Natural Resources, Industrial Goods, Consumer Goods, Conglomerates, Healthcare, and Agriculture. Secondary data, validated by external auditors, was used, and the pooled panel technique was applied to manage missing data and analyze relationships effectively.

Model Specifications

The model for this study will be stated in econometrics terms below as;

$$ESGSDI_{it} = \alpha_0 + \beta_1 ROA_{it} + \beta_2 ROE_{it} + \beta_3 EBIT_{it} + \beta_4 EPS_{it} + \beta_5 FSIZE_{it} + \varepsilon_t \quad \text{eq. I}$$

$$SRDSDI_{it} = \alpha_0 + \beta_1 ROA_{it} + \beta_2 ROE_{it} + \beta_3 EBIT_{it} + \beta_4 EPS_{it} + \beta_5 FSIZE_{it} + \varepsilon_t \quad \text{eq. II}$$

$$GOVSDI_{it} = \alpha_0 + \beta_1 ROA_{it} + \beta_2 ROE_{it} + \beta_3 EBIT_{it} + \beta_4 EPS_{it} + \beta_5 FSIZE_{it} + \varepsilon_t \quad \text{eq. III}$$

Where;

ESGSDI = Environmentally Sustainable Disclosure index (measured as Index score generated from the score of 1 or 0 for disclosures or otherwise on material, energy, water, biodiversity, emission/greenhouse gas, waste management, product services and compliance to laws.

SRDSDI = Social Sustainable Disclosure index (measured as Index score generated from the score of 1 or 0 for disclosures or otherwise on community, donation, employee, health and safety and customer/complaints.

GOVSDI = Governance Sustainable Disclosure index (measured as measures the extent of corporate Governance, Social, and Environmental (GSE) information disclosure by companies related to their GSE performance.

ROA = Return on Asset: measured as profit after tax divided by total asset (%)

ROE = Return on Equity: measured as profit after tax divided by total equity (%)

EBIT = Ebit Margin: measured as earnings before interest and taxes divided by sales (%)

EPS = Earnings Per Share: measured as net profit after tax divided by number of ordinary shares

FS = Firm Size (Measured as the natural logarithm of total assets of firm i in year t)

f = functional relationship between dependent and independent variables

ε_t = error term

i = firm identifier

t = time variable (10 Years)

α_0 is the intercept of the regression.

$\beta_1 - \beta_5$ are the co-efficient of the regression equation.

The Apriori expectation: $\beta_1 - \beta_5$ is lesser or greater than 0.

Analysis and Discussion of Results

Descriptive Statistics Analysis and Discussion

Table 1: Summary of Descriptive for ESGSDI SRDSDI GOVSDI ROA ROE EBIT EPS and FSIZE

VARIABLES	OBS	MEAN	STD. DEV	MIN	MAX
ESGSDI	330	.5404361	.5249065	-.9811688	3.484753
SRDSDI	330	.3212424	.1661745	0	.79
GOVSDI	330	.4002121	.1922217	0	.83
ROA	330	4.45339	15.88686	-71.3574	176.2669
ROE	330	5.906927	106.0372	-989.3803	905.423
EBIT	330	23.93526	315.4186	-624.4804	5655.464
EPS	330	4.141648	18.67017	-100.2626	202.5645
FSIZE	330	16.93317	2.079749	12.83807	22.09412

Source: Regression Output, 2025.

The descriptive statistics for the variables in the study provide an overview of the distribution and variability of the data. ESGSDI (Environmental, Social, and Governance Sustainability Disclosure Index) has a mean of 0.54 with a high standard deviation of 0.52, suggesting significant variability in the level of sustainability disclosures across the sample. The minimum and maximum values of -0.98 and 3.48 indicate a wide range in the degree of ESG reporting among firms. SRDSDI (Social Responsibility Disclosure Sustainability Index) shows a mean of 0.32, with a standard deviation of 0.17, implying moderate

variation in social responsibility disclosures, and the maximum value of 0.79 suggests a limited number of firms reporting extensively on social sustainability.

ROA, ROE, EBIT, and EPS display considerable variability, particularly ROE, which has a large standard deviation of 106.04, indicating significant profit fluctuations among firms. FSIZE (Firm Size) has a mean of 16.93 and a standard deviation of 2.08, suggesting moderate variation in firm sizes across the sample. Overall, these descriptive statistics indicate a diverse sample with substantial variation in both sustainability reporting and financial performance.

Normality Test

Table 2: Shapiro-Wilk W test for normal data for ESGSDI SRDSDI GOVSDI ROA ROE EBIT EPS and FSIZE

VARIABLES	OBS	W	V	Z	PROB>Z
ESGSDI	330	0.86244	31.896	8.165	0.00000
SRDSDI	330	0.99305	1.610	1.124	0.13057
GOVSDI	330	0.96681	7.697	4.812	0.00000
ROA	330	0.64588	82.108	10.394	0.00000
ROE	330	0.30626	160.855	11.980	0.00000
EBIT	330	0.07159	215.266	12.667	0.00000
EPS	330	0.39663	139.899	11.651	0.00000
FSIZE	330	0.97773	5.163	3.871	0.00005

Source: Regression Output, 2025.

The Shapiro-Wilk W test results for normality indicate that most of the variables, including ESGSDI, GOVSDI, ROA, ROE, EBIT, and EPS, significantly deviate from normality, as their p-values are below 0.05 ($p < 0.00000$). This suggests that these variables are not normally distributed. However, SRDSDI and FSIZE show p-values greater than 0.05 (0.13057 and

0.00005, respectively), with SRDSDI not significantly deviating from normality, while FSIZE also fails to meet the assumption of normality. The non-normality in many financial and sustainability variables may warrant transformations or the use of non-parametric tests in subsequent analyses.

Correlation Analysis

Table 3: Summary of Spearman Correlation Matrix for ESGSDI SRDSDI GOVSDI ROA ROE EBIT EPS and FSIZE, stats, stats(rho p) star(0.05)

	ESGSDI	SRDSDI	GOVSDI	ROA	ROE	EBIT	EPS	FSIZE
ESGSDI	1.0000							
SRDSDI	0.1633*	1.0000						
	0.0004							
GOVSDI	0.1768	0.6975*	1.0000					
	0.0017	0.0000						
ROA	0.0176	-0.0667	-0.1093*	1.0000				
	0.7503	0.2269	0.0472					
ROE	-0.1067	0.0471	0.0268	0.0119	1.0000			
	0.0527	0.3942	0.6280	0.8301				
EBIT	-0.0996	0.0155	-0.0035	-0.1022	0.0995	1.0000		
	0.0707	0.7796	0.9488	0.0637	0.0710			
EPS	-0.0494	0.0631	0.0552	-0.0031	0.1709*	0.0005	1.0000	
	0.3709	0.2533	0.3174	0.9551	0.0018	0.9923		
FSIZE	-0.1342*	-0.0278	-0.1447*	-0.1108*	0.1960*	0.0091	0.5033*	1.0000
	0.0147	0.6153	0.0085	0.0444	0.0003	0.8699	0.0000	

Source: Regression Output, 2025.

Result of Multicollinearity Test Using Variance Inflation Factor (VIF)g

Table 4: VIF Test Result

MODELS		VARIABLES	VIF	1/VIF	MEAN VIF
1	ESGSDI	FSIZE	1.02	0.979420	1.01
		EPS	1.02	0.981551	
2	SRDSDI	ROA	1.00	0.995295	
		ROE	1.00	0.996127	
3	GOVSDI	EBIT	1.00	0.999656	

Source: Regression Output, 2025

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Table 5: Breusch and Pagan Lagrangian Multiplier Tests fitted values

MODELS	VARIABLE	CHI2(1)	PROB > CHI2
1	ESGSDI	6.31	0.0120
2	SRDSDI	1.28	0.2580
3	GOVSDI	0.13	0.7210

Source: Regression Output, 2025.

Levin-Lin-Chu Panel Unit Root Test

Table 6: Diagnostic Tests Results for all the variables at First Differencing

Test	Variable	Level/1st Diff. [1(1)]	Unadjusted t	Adjusted t	p-Value	Stationarity Conclusion
ESGSDI	DESGSDI	First Difference	-12.6223	-3.9027	0.0000	Stationary
SRDSDI	DSRDSDI	First Difference	-12.1416	-4.0228	0.0000	Stationary
GOVSDI	DGOVSDI	First Difference	-14.1230	-6.6017	0.0000	Stationary
ROA	DROA	First Difference	-19.4847	-10.4046	0.0000	Stationary
ROE	DROE	First Difference	-17.3456	-8.6270	0.0000	Stationary
EBIT	DEBIT	First Difference	-17.6658	-9.0103	0.0000	Stationary
EPS	DEPS	First Difference	-16.3616	-6.7525	0.0000	Stationary
FSIZE	DFSIZE	First Difference	-13.6143	-6.6386	0.0000	Stationary

Source: Regression Output, 2025

The Levin-Lin-Chu (LLC) panel unit root test results indicate that ESGSDI, GOVSDI, ROA, ROE, EBIT, and EPS are stationary at level, as their p-values are below 0.05 (0.0000), suggesting they do not contain a unit root and are suitable for further analysis without differencing. However, SRDSDI, FSIZE, and EPS are non-stationary at level, with p-values of 0.3131 and

0.5110, indicating the need for first differencing to achieve stationarity. However, after first differencing, all variables, including SRDSDI, FSIZE, GOVSDI, ROA, ROE, EBIT, EPS, and FSIZE, become stationary with p-values of 0.0000, confirming that they are free from unit roots and can be used for further regression analysis.

Hypotheses Testing for the Model I

Table 7a: Summary PCSE for DESGSDI DROA DROE DEBIT DEPS and DFSIZE

DESGSDI	COEF.	Panel-Corrected STD. ERR.	z	P> z
DROA	-.0010466	.0008741	-1.20	0.231
DROE	.0000578	.000068	0.85	0.396
DEBIT	-.0000244	.0000263	-0.93	0.354
DEPS	.0001007	.0013209	0.08	0.939
DFSIZE	.1757749	.0724723	2.43	0.015
_CONS	-.012005	.023353	-0.51	0.607
N				297
R-squared				0.0147
Wald chi2(5)				9.24
Prob > chi2				0.0998

Source: Regression Output, 2025

The results from the panel-corrected standard errors (PCSE) for Model I indicate that the variables DROA, DROE, DEBIT, and DEPS do not significantly influence DESGSDI (Environmental Sustainability Disclosure Index) as their p-values are greater than 0.05 (0.231, 0.396, 0.354, and 0.939, respectively). This suggests that changes in profitability metrics such as ROA, ROE, and EBIT, along with EPS, do not have a strong relationship with environmental disclosures.

However, DFSIZE (Firm Size) has a statistically significant positive effect on DESGSDI with a coefficient of 0.1757 and p-value of 0.015, indicating that larger firms are more likely to report environmental sustainability disclosures. The R-squared value of 0.0147 suggests that the model explains a small portion of the variation in DESGSDI. The Wald chi-squared test ($p = 0.0998$) indicates that, collectively, the variables are not highly significant.

Hypotheses Testing for the Model II

Table 7b: Summary PCSE for DSRDSI DROA DROE DEBIT DEPS and DFSIZE

	Panel-Corrected			
DSRDSI	COEF.	STD. ERR.	z	P> z
DROA	.0001547	.0002616	0.59	0.554
DROE	.0000305	.0000224	1.36	0.175
DEBIT	3.90e-07	7.08e-06	0.06	0.956
DEPS	-.0001336	.0004612	-0.29	0.772
DFSIZE	.0347136	.0232946	1.49	0.136
_CONS	-.0006151	.0060337	-0.10	0.919
N				297
R-squared				0.0068
Wald chi2(5)				5.49
Prob > chi2				0.3592

Source: Regression Output, 2025

The results from the panel-corrected standard errors (PCSE) for Model II indicate that none of the profitability metrics (DROA, DROE, DEBIT, DEPS) significantly affect DSRDSI (Social Responsibility Disclosure Sustainability Index), as all p-values exceed 0.05 (0.554, 0.175, 0.956, and 0.772, respectively).

This suggests that changes in profitability do not strongly influence social sustainability disclosures. The R-squared value of 0.0068 suggests that the model explains very little variation in social sustainability disclosures.

Hypotheses Testing for the Model III

Table 7c: Summary PCSE for DGOVSDI DROA DROE DEBIT DEPS and DFSIZE

	Panel-Corrected			
DGOVSDI	COEF.	STD. ERR.	z	P> z
DROA	.0006196	.0006985	0.89	0.375
DROE	-.0000533	.0000377	-1.41	0.157
DEBIT	9.53e-06	.0000331	0.29	0.773
DEPS	.0004599	.0003977	1.16	0.247
DFSIZE	.0225629	.0299752	0.75	0.452
_CONS	-.0042591	.0104903	-0.41	0.685
N				297
R-squared				0.0142
Wald chi2(5)				9.10
Prob > chi2				0.1050

Source: Regression Output, 2025

The results from the panel-corrected standard errors (PCSE) for Model III show that none of the profitability metrics (DROA, DROE, DEBIT, DEPS) significantly influence DGOVSDI (Governance Sustainability Disclosure Index), as all p-values are above 0.05 (0.375, 0.157, 0.773, and 0.247, respectively). This indicates that profitability metrics do not have a strong impact on governance sustainability disclosures. DFSIZE (Firm Size) also does not have a statistically significant effect on DGOVSDI ($p = 0.452$). The R-squared value of 0.0142 suggests that the model explains a very small proportion of the variation in governance disclosures. The Wald chi-squared statistic of 9.10 ($p = 0.1050$)

further indicates that the model is not statistically significant, and the explanatory variables do not collectively influence governance sustainability disclosures in the sample.

Discussion of Findings

The results of the hypotheses testing across the three models indicate varied impacts of profitability metrics on sustainability disclosures. In Model I (environmental sustainability disclosure index, DESGSDI), profitability metrics such as ROA, ROE, EBIT, and EPS show no significant relationship with environmental disclosures, as indicated by their high p-values (0.231, 0.396, 0.354, and 0.939, respectively).

However, DFSIZE (firm size) has a significant positive effect on DESGSDI ($p = 0.015$), suggesting that larger firms tend to report more on environmental sustainability, possibly due to better resources and regulatory pressure (Khan, et al. 2021; Ali, et al, 2018). The R-squared value of 0.0147 suggests that the model explains only a small portion of the variation in environmental sustainability disclosures.

In Model II (social responsibility disclosure sustainability index, DSRDSI), none of the profitability metrics or firm size show a significant relationship with social disclosures, as all p-values exceed 0.05. The R-squared value of 0.0068 and the Wald chi-squared result of 5.49 ($p = 0.3592$) indicate that the model is not significant in explaining social sustainability disclosures.

In Model III (governance sustainability disclosure index, DGOVSDI), similar results are found, with no significant effects from ROA, ROE, EBIT, EPS, or DFSIZE on governance disclosures. The R-squared value of 0.0142 and the Wald chi-squared statistic of 9.10 ($p = 0.1050$) indicate that governance disclosures are not strongly influenced by profitability metrics in this study.

These findings align with previous research, which suggests that in emerging markets, profitability may not always correlate directly with sustainability reporting due to varying regulatory environments and organizational priorities (Bose, et al. 2022; Nmer, et al. 2021).

Summary, Conclusion and Recommendations

Summary of Findings

- i. For Environmental Sustainability Reporting, the analysis shows no significant effect of profitability metrics (ROA, ROE, EBIT, EPS) on DESGSDI (environmental sustainability disclosure). Therefore, the null hypothesis is accepted.
- ii. For Social Sustainability Disclosures, Profitability metrics and firm size have no significant impact on DSRDSI (social sustainability disclosure). The null hypothesis is accepted.
- iii. H_{03} (Governance Sustainability Disclosures): Profitability metrics and firm size do not significantly affect DGOVSDI (governance sustainability disclosure). The null hypothesis is accepted.

Conclusion

This study concludes that profitability metrics for the study which includes ROA, ROE, EBIT, and EPS, do not significantly impact environmental, social, or governance sustainability disclosures (DESGSDI, DSRDSI, DGOVSDI) in emerging market industries. The findings suggest that in emerging markets,

sustainability disclosures are influenced by factors other than profitability, particularly organizational size. These results highlight the complexity of sustainability reporting and the need for further investigation into other potential drivers within these markets.

Recommendations

- i. Policy-makers should develop clearer sustainability reporting standards to encourage greater transparency and uniformity in disclosures across industries.
- ii. Companies in emerging markets should invest in improving their sustainability reporting practices, particularly in the environmental sector, to align with global standards and attract investors.
- iii. Future research should explore other factors, such as regulatory pressures and corporate culture, that may influence sustainability disclosures in emerging market industries.
- iv. Investors should consider firm size and governance practices when assessing sustainability performance, as these factors appear more impactful than profitability metrics.

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Eco-Product Packaging and Sales Performance of Food and Beverage Firms in Yenagoa, Bayelsa State

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Abstract

This study examined the relationship between Eco-product packaging and sales performance of food and beverage firms in Yenagoa, Bayelsa State. Specifically, it investigated the relationships between biodegradable packaging, and recyclable packaging and customer patronage. The study adopted a descriptive survey design. A total of 20 food and beverage firms were selected, as obtained from the Bayelsa State Ministry of Commerce and Industry as of March 2025. The researcher purposively administered ten (10) copies of the questionnaire to customers in each of the 20 selected food and beverage firms in Yenagoa, Bayelsa State. This gave a total of two hundred (200) copies of the questionnaire. After data cleansing, 190 retrieved questionnaires were used for data analysis. Data were collected through a structured questionnaire and analyzed using the Pearson Product Moment Correlation Coefficient (PPMC) at a 0.05 significance level. The findings revealed a strong and positive relationship between biodegradable packaging and customer patronage ($r = 0.842$, $p = 0.012$), indicating that firms adopting biodegradable materials attract more environmentally conscious customers. Similarly, recyclable packaging showed a strong positive relationship with customer patronage ($r = 0.816$, $p = 0.017$), suggesting that customers are more likely to patronize firms that promote waste reduction through recycling. The study concludes that eco-friendly packaging significantly influences customer patronage in Yenagoa's food and beverage industry. It recommends that firms should integrate environmentally sustainable packaging strategies into their operations, not only to comply with environmental regulations but also to gain competitive advantage by appealing to the growing segment of eco-conscious consumers.

Keywords: Sales performance, biodegradable packaging, recyclable packaging, customer patronage, eco-friendly packaging

Introduction

The rising global concern for environmental sustainability has reshaped business practices, particularly in the food and beverage sector. A key element of sustainable operations is eco-product packaging, which involves the use of biodegradable, recyclable, or reusable materials. Eco-packaging has become a strategic factor influencing consumer purchasing behavior and sales performance, as it enhances brand image and fosters customer loyalty (Kumar & Prakash, 2023; Zhang et al., 2022). In Yenagoa, Bayelsa State, demand for eco-friendly products is increasing as consumers become more environmentally conscious. Many are willing to support businesses that demonstrate sustainability through packaging choices (Okafor et al., 2023). Eco-

packaging not only reduces pollution but also aligns with government policies such as those promoted by the National Environmental Standards and Regulations Enforcement Agency (NESREA), which seeks to curb plastic waste in Nigeria (Adebayo & Yusuf, 2023).

Sales performance in the food and beverage sector depends on product quality, pricing, and branding, but eco-packaging is increasingly recognized as a driver of customer preference. Studies show that businesses adopting sustainable packaging gain stronger brand reputation, customer retention, and higher revenue (Adegbite et al., 2023; Akinola & Okeke, 2022). Many consumers prefer products with biodegradable or recyclable packaging, viewing them as healthier and more responsible choices. However, challenges persist. Sustainable packaging materials often cost more than

conventional plastics, creating financial strain for small and medium-sized enterprises (SMEs) (Eze & Nwachukwu, 2023). Consumer awareness is also uneven, with some buyers still prioritizing affordability over sustainability (Ibrahim & Olayemi, 2023). These barriers call for strategic implementation supported by government incentives and consumer education to ensure affordability and adoption.

The environmental challenges facing Yenagoa, including flooding and plastic waste pollution, make eco-friendly packaging especially urgent. Plastic disposal contributes significantly to degradation, reinforcing the need for food and beverage firms to embrace sustainable alternatives (Nwankwo & Agbo, 2023). Beyond reducing waste, eco-packaging strengthens corporate social responsibility (CSR), enhances brand loyalty, and improves long-term sales performance.

Despite growing awareness of sustainability, limited empirical research exists on the impact of eco-product packaging on sales performance in Yenagoa's food and beverage industry. Most prior studies take a broader perspective, leaving a gap in understanding local consumer behavior and profitability impacts (Ogunleye et al., 2023). This study addresses this gap by examining how eco-product packaging affects purchasing decisions, brand perception, and sales growth in Yenagoa.

Statement of the Problem

The growing global emphasis on environmental sustainability has encouraged the adoption of eco-product packaging. However, in developing contexts such as Nigeria, its application in the food and beverage sector remains inconsistent (Kumar & Prakash, 2023). Although studies link eco-packaging to consumer purchasing behavior, little is known about its direct influence on sales performance in Yenagoa, Bayelsa State. One key barrier is cost. Many small and medium-sized enterprises (SMEs) face financial difficulties transitioning from conventional plastics to biodegradable or recyclable alternatives (Eze & Nwachukwu, 2023). The high cost of sustainable materials discourages adoption, reducing competitiveness (Adegbite et al., 2023). Additionally, consumer preferences differ: while some prioritize sustainability and are willing to pay more, others focus

on affordability, creating uncertainty for firms (Ibrahim & Olayemi, 2023). Weak regulatory enforcement further limits adoption (Adebayo & Yusuf, 2023). In Yenagoa, where plastic waste pollution threatens environmental health, the reluctance of firms to fully adopt eco-packaging raises sustainability concerns. Without empirical data on its impact on sales, firms may continue prioritizing short-term cost savings over long-term benefits (Nwankwo & Agbo, 2023). This study, therefore, investigates the relationship between eco-packaging and sales performance, offering insights to promote sustainable business practices (Ogunleye et al., 2023).

Objectives of the study

The main aim of this study is to investigate the influence of eco-product packaging and sales performance of food and beverage firms in Yenagoa, Bayelsa State. Specifically, the study seeks to;

1. To determine the extent of relationship between biodegradable packaging and customer patronage of food and beverage firms in Yenagoa, Bayelsa State
2. To determine the extent of relationship between recyclable packaging and customer patronage of food and beverage firms in Yenagoa, Bayelsa State.

Research Questions

The following research questions would guide the study;

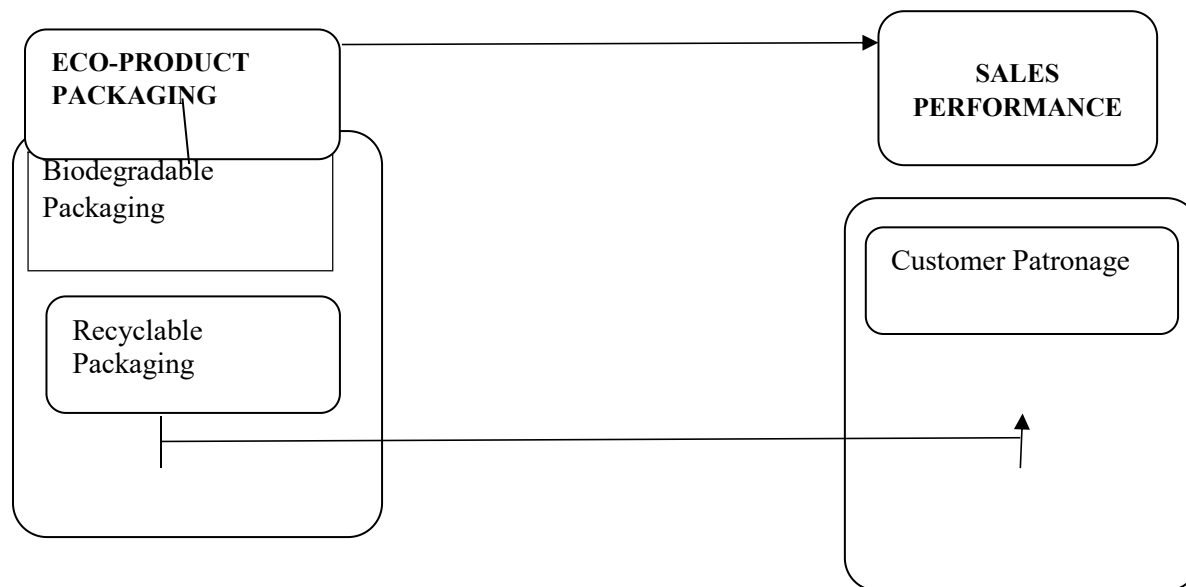
1. What is the relationship between biodegradable packaging and customer patronage of food and beverage firms in Yenagoa, Bayelsa State?
2. What is the relationship between recyclable packaging and customer patronage of food and beverage firms in Yenagoa, Bayelsa State?

Hypotheses

- H0₁:** There is no significant relationship between biodegradable packaging and customer patronage of food and beverage firms in Yenagoa, Bayelsa State
- H0₂:** There is no significant relationship between recyclable packaging and customer patronage of food and beverage firms in Yenagoa, Bayelsa State

Literature Review

Conceptual Framework



Source: Adopted from the works of (Nwankwo & Agbo, 2023; Kumar & Prakash, 2023; (Zhang et al., 2022)

Fig 1.1: Conceptual framework on the relationship between eco-product packaging and sales performance of food and beverage firms in Yenagoa, Bayelsa State

Concept of Eco-Product Packaging

The growing global emphasis on sustainability has transformed packaging practices, especially in the food and beverage industry. Eco-product packaging involves using biodegradable, recyclable, and reusable materials to reduce environmental harm. It is a key element of green business strategies, helping firms minimize waste, conserve resources, and align with climate change goals (Kumar & Prakash, 2023). This shift is driven by consumer awareness, regulatory policies, and corporate responsibility initiatives (Adegbite et al., 2023). Biodegradable packaging, such as compostable wraps, plant-based plastics, and paper alternatives, decomposes naturally, unlike conventional plastics that persist for centuries. These solutions reduce pollution and improve brand perception, as consumers increasingly support firms committed to sustainability (Ibrahim & Olayemi, 2023).

Recyclable packaging also plays a central role by ensuring materials like glass, aluminum, and certain plastics can be collected and reprocessed into new products. This reduces landfill waste, conserves raw materials, and cuts production-related pollution and energy use (Adebayo & Yusuf, 2023). Firms adopting recyclable options benefit from regulatory compliance, cost savings, and enhanced loyalty among eco-conscious consumers (Ogunleye et al., 2023). Reusable packaging furthers sustainability by extending product lifecycles. Examples include refillable bottles, durable

shopping bags, and collapsible containers. These not only reduce disposable waste but also create long-term value for customers through cost-effective and sustainable use (Eze & Nwachukwu, 2023).

Government policies and environmental regulations also shape adoption. In Nigeria, the National Environmental Standards and Regulations Enforcement Agency (NESREA) has developed guidelines encouraging industries to adopt eco-friendly practices (Nwankwo & Agbo, 2023). Compliance strengthens consumer trust and enhances market competitiveness (Okafor et al., 2023). Despite its benefits, eco-packaging adoption faces challenges. Biodegradable and recyclable materials are often costlier, posing difficulties for SMEs (Akinola & Okeke, 2022). Moreover, consumer willingness to pay premiums varies, with affordability sometimes prioritized over sustainability. Nonetheless, as environmental awareness grows, more consumers are likely to support eco-conscious firms (Kumar & Prakash, 2023).

Dimensions of Eco-Product Packaging

Eco-product packaging encompasses various dimensions that contribute to environmental sustainability, waste reduction, and efficient resource utilization. The three primary dimensions of eco-product packaging include biodegradable packaging, recyclable packaging, and reusable packaging. These dimensions aim to minimize the environmental impact

of packaging materials while enhancing brand value and consumer trust (Kumar & Prakash, 2023).

Biodegradable Packaging

Biodegradable packaging refers to materials that decompose naturally when exposed to microorganisms, moisture, and heat, breaking down into non-toxic elements such as water, carbon dioxide, and biomass (Zhang et al., 2022). Unlike conventional plastic packaging, which takes hundreds of years to degrade, biodegradable materials decompose within a shorter period, reducing the accumulation of non-degradable waste in the environment (Adebayo & Yusuf, 2023). Common materials used in biodegradable packaging include cornstarch-based plastics, bamboo, palm leaves, and paperboard. These materials are designed to serve the same purpose as traditional packaging while ensuring minimal ecological harm. Businesses that adopt biodegradable packaging benefit from improved corporate social responsibility (CSR) ratings, enhanced customer loyalty, and regulatory compliance with environmental policies (Adegbite et al., 2023). However, a major challenge with biodegradable packaging is its production cost, which is often higher than that of conventional plastics, making it less affordable for small and medium-sized enterprises (SMEs) (Ibrahim & Olayemi, 2023).

Recyclable Packaging

Recyclable packaging consists of materials that can be collected, processed, and reformed into new products after use. This type of packaging helps to conserve natural resources, reduce waste generation, and lower greenhouse gas emissions (Ogunleye et al., 2023). Common recyclable packaging materials include glass, aluminum, cardboard, and certain plastics (marked with recycling symbols indicating their reusability).

Concept of Sales Performance

Sales performance refers to how effectively a business achieves revenue targets, market expansion, and customer retention through sales of products or services. It is a key indicator of business success, especially in competitive industries like food and beverages (Kumar & Prakash, 2023). Major determinants include product quality, pricing, brand positioning, and marketing strategies. Recently, sustainable practices such as eco-product packaging have emerged as significant contributors (Zhang et al., 2022). Customer patronage, measured by purchase frequency and volume, is a primary indicator of sales performance. Eco-friendly packaging often attracts sustainability-conscious buyers, enhancing loyalty and brand preference (Adebayo & Yusuf, 2023). Studies confirm that environmentally responsible packaging improves customer retention and stimulates word-of-

mouth referrals, thereby increasing sales (Adegbite et al., 2023; Ogunleye et al., 2023).

Sales revenue, the total income from product sales, is another vital metric. Eco-packaging can support premium pricing since many consumers willingly pay more for sustainable products (Akinola & Okeke, 2022). When combined with strong marketing, this approach fosters revenue growth. However, challenges such as high production costs and varying consumer awareness may reduce profitability (Eze & Nwachukwu, 2023). Customer retention also strongly influences performance. Firms that integrate affordability, quality, and eco-sustainability in packaging maintain long-term customer relationships (Ibrahim & Olayemi, 2023). In food and beverages, where loyalty is essential, eco-friendly packaging enhances reputation, minimizes churn, and boosts lifetime value (Nwankwo & Agbo, 2023).

Measures of Sales Performance

Customer Patronage

Customer patronage refers to the degree to which consumers repeatedly purchase products or services from a business. It reflects customer interest, preference, and loyalty towards a brand, often influenced by factors such as product quality, pricing, customer experience, and sustainability initiatives (Adegbite et al., 2023). In the context of the food and beverage industry, customer patronage is particularly important, as businesses in this sector rely heavily on repeat purchases to sustain operations and profitability (Ogunleye et al., 2023).

The adoption of **eco-product packaging** has been shown to positively influence customer patronage. Many consumers today are increasingly drawn to brands that align with their environmental values, leading them to favor businesses that utilize biodegradable, recyclable, or reusable packaging (Adebayo & Yusuf, 2023). Studies suggest that companies that integrate sustainable packaging experience a boost in brand reputation and customer engagement, ultimately driving higher levels of patronage (Ibrahim & Olayemi, 2023). However, for firms to fully capitalize on this trend, they must effectively communicate the benefits of their eco-friendly initiatives to their target audience.

Eco-Product Packaging and Sales Performance of Food and Beverage Firms

Eco-product packaging has emerged as a critical driver of sales performance in the food and beverage sector as consumers increasingly prioritize sustainability. Biodegradable, recyclable, and reusable packaging options not only reduce environmental pollution but also function as strategic marketing tools that enhance brand image, customer loyalty, and profitability

(Kumar & Prakash, 2023). By integrating eco-packaging, firms differentiate themselves in competitive markets, appealing to environmentally conscious consumers and boosting sales outcomes (Adebayo & Yusuf, 2023). Empirical evidence supports this trend. Adebite et al. (2023) reported that firms adopting eco-packaging experience stronger customer loyalty and higher purchase frequency. Ogunleye et al. (2023) similarly found that over 60% of consumers in emerging markets prefer eco-friendly packaged products. Such preferences provide firms with a competitive edge by strengthening brand perception, repeat patronage, and retention. Eco-packaging also enhances revenue potential through premium pricing. Many consumers are willing to pay more for sustainably packaged products, viewing them as healthier and ethically aligned (Zhang et al., 2022; Eze & Nwachukwu, 2023). Additionally, sustainable packaging fosters trust and repeat purchases, ensuring long-term revenue stability (Akinola & Okeke, 2022).

Biodegradable Packaging and Sales Performance

Biodegradable packaging, designed to decompose naturally and reduce waste, has gained prominence as food and beverage firms respond to consumer demand for sustainability. With growing concerns over plastic pollution, consumers increasingly prefer biodegradable alternatives, which strengthens brand reputation and drives sales performance (Kumar & Prakash, 2023). Research confirms that eco-conscious customers patronize brands adopting biodegradable packaging because they associate them with environmental responsibility (Adebayo & Yusuf, 2023).

Adebite et al. (2023) reported that firms using biodegradable materials experience higher customer patronage, while Akinola and Okeke (2022) observed that such firms enjoy stronger market positioning and improved brand recognition. Moreover, consumers often accept higher prices for biodegradable packaging, boosting sales revenue and profitability (Zhang et al., 2022). Nevertheless, SMEs face obstacles due to higher costs of production and concerns about packaging durability, particularly in preserving food quality (Eze & Nwachukwu, 2023). Despite these challenges, the long-term benefits of customer loyalty and positive brand perception make biodegradable packaging a valuable investment for sustaining competitiveness (Ogunleye et al., 2023).

Recyclable Packaging and Sales Revenue

Recyclable packaging, which allows materials to be reprocessed and reused, is another key driver of sales growth in the food and beverage industry. By reducing waste and conserving resources, recyclable packaging reinforces corporate social responsibility while shaping consumer preferences (Kumar & Prakash, 2023).

Evidence shows that consumers actively support brands using recyclable materials, with many willing to pay a premium for products reflecting environmental values (Adebayo & Yusuf, 2023). Adebite et al. (2023) found that recyclable packaging boosts demand and profitability by strengthening trust and brand loyalty.

Additionally, recyclable packaging enhances **market competitiveness**. By signaling environmental commitment, firms differentiate themselves from rivals and build lasting customer relationships that translate into repeat purchases and revenue growth (Zhang et al., 2022). Governments also encourage recyclable practices through incentives and compliance requirements, allowing firms to avoid penalties while tapping into eco-conscious markets (Eze & Nwachukwu, 2023). However, barriers such as limited recycling infrastructure and high material costs persist, especially for smaller firms (Ibrahim & Olayemi, 2023).

Theoretical Foundation

The Theory of Planned Behavior

The Theory of Planned Behavior (TPB) (Ajzen, 1991) explains human behavior through intentions, attitudes, subjective norms, and perceived behavioral control. It is relevant to understanding how eco-product packaging influences sales performance in the food and beverage industry.

Attitude reflects consumer evaluation of eco-friendly packaging. When consumers perceive biodegradable or recyclable packaging as beneficial to environmental sustainability, they are more inclined to purchase such products (Kumar & Prakash, 2023). Positive perceptions strengthen brand loyalty and customer retention (Adebayo & Yusuf, 2023). Conversely, if eco-packaging is seen as inconvenient or less durable, sales performance may decline. Subjective norms involve social pressures shaping behavior. In Yenagoa, Bayelsa State, growing environmental awareness and cultural expectations encourage eco-friendly practices (Okafor et al., 2023). Media campaigns, advocacy groups, and peer influence motivate consumers to adopt sustainable choices, thereby enhancing firm sales (Nwankwo & Agbo, 2023).

Perceived behavioral control considers how cost, accessibility, and convenience affect eco-friendly purchasing. High prices may discourage low-income consumers, limiting sales (Eze & Nwachukwu, 2023). However, firms offering affordable, innovative eco-packaging can expand their customer base and boost revenue (Ibrahim & Olayemi, 2023). Overall, TPB illustrates how attitudes, norms, and perceived control determine consumer willingness to purchase eco-packaged products. Food and beverage firms that highlight environmental benefits, leverage social influence, and reduce barriers to adoption can use eco-packaging as a competitive advantage. This alignment

with TPB principles can enhance sales performance and strengthen market presence (Ogunleye et al., 2023).

Review of Empirical Literature

Kumar & Prakash (2023) studied The Impact of Sustainable Packaging on Consumer Purchasing Behavior. This study examines the influence of sustainable packaging on consumer purchase decisions in the food and beverage industry. Using a survey of 500 respondents, the research finds that biodegradable and recyclable packaging significantly affects consumer preferences. The study highlights that environmental awareness and corporate social responsibility (CSR) initiatives positively impact brand loyalty and sales growth. The authors conclude that companies integrating sustainable packaging strategies experience higher consumer retention and long-term profitability.

Adegbite et al. (2023) worked on Eco-Friendly Packaging and Sales Performance in Nigeria's Beverage Sector.. investigate the relationship between eco-product packaging and sales performance among beverage companies in Nigeria. The study employs a mixed-methods approach, analyzing sales data and conducting interviews with industry stakeholders. Findings reveal that firms adopting recyclable and reusable packaging report increased market competitiveness and higher customer satisfaction. However, the study notes that high production costs pose a challenge for small and medium-sized enterprises (SMEs). The research suggests that government incentives could enhance the adoption of sustainable packaging solutions.

Akinola & Okeke (2022) examined Consumer Perception of Eco-Packaging and Its Effect on Sales Growth. This study explores how consumer perceptions of eco-friendly packaging influence purchasing decisions and sales growth in the food sector. A survey of 300 customers in urban Nigerian markets indicates that consumers are more likely to purchase products with sustainable packaging when they perceive them as high quality and environmentally friendly. The research also highlights that younger

consumers are more responsive to eco-packaging than older demographics. The authors recommend increased consumer education on the benefits of sustainable packaging to drive sales performance.

Methodology

This study adopted a descriptive survey design, suitable for examining the relationship between eco-product packaging and sales performance in the food and beverage industry (Creswell, 2022). The population comprised customers of food and beverage firms in Yenagoa, Bayelsa State. From a list of 20 firms provided by the Bayelsa State Ministry of Commerce and Industry, the researcher purposively administered 10 questionnaires to customers in each firm, giving a total of 200 respondents. Convenience sampling was employed to select participants readily accessible at the time of the survey (Ezejelue et al., 2008). Primary data were collected through a structured questionnaire divided into three sections: demographic information (age, gender, education, occupation), eco-product packaging dimensions (biodegradable, recyclable, reusable packaging), and sales performance indicators (customer patronage, sales revenue, retention). Secondary data from scholarly articles, policies, and industry reports supplemented the study. The instrument was validated through expert review and pretested with 20 respondents. Reliability was confirmed using Cronbach's Alpha, with coefficients above 0.70 indicating internal consistency (Bryman & Bell, 2022). Data were analyzed using SPSS, employing descriptive statistics and Pearson correlation. Hypotheses were tested at the 0.05 significance level (Hair et al., 2021).

Result and Discussion

A total of 200 questionnaires were distributed to respondents selected for the study. Out of these, 195 were returned, and 190 were properly completed and valid for analysis. This resulted in a usable response rate of 95.0%. The summary is presented in Table 4.1 above.

Table 4.1: Distribution and Retrieval of Questionnaire

Questionnaire	Frequency	Percentage (%)
Number Administered	200	100%
Number Retrieved	195	97.5%
Number Used (Valid)	190	95.0%

Table 4.2: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	80	42.1
	Female	110	57.9
Age	Below 20 years	10	5.3
	20–30 years	60	31.6
	31–40 years	70	36.8
	41–50 years	40	21.1
	Above 50 years	10	5.3
Educational Qualification	O’Level (GCE/WASSCE/SSCE)	30	15.8
	OND/NCE/TC II	40	21.1
	B.Sc/B.Ed/B.A	90	47.4
	M.Sc/MBA/M.A	30	15.8
Total Respondents		190	100

The demographic profile indicates a diverse sample. Females constituted 57.9%, compared to 42.1% males, likely reflecting firm structures or survey availability. Most respondents (68.4%) were within the productive 20–40 years bracket. The largest share was aged 31–40 (36.8%), followed by 20–30 (31.6%). Those aged 41–50 represented 21.1%, while respondents below 20 and above 50 years were least represented (5.3% each). Educationally, the workforce is well-qualified: 47.4% held bachelor’s degrees, 21.1% OND/NCE/TC II, and 15.8% each postgraduate and O’Level. Overall, the

sample is predominantly female, mostly within active career years, and relatively well-educated, enhancing the reliability and representativeness of the findings.

Hypotheses Testing

Hypothesis One

H0: There is no significant relationship between biodegradable packaging and customer patronage of food and beverage firms in Yenagoa, Bayelsa State.

Table 4.15: Statistical Analysis for Hypothesis One

	Biodegradable Packaging	Customer Patronage
Pearson Correlation (r)	1.000	.812
Sig. (2-tailed)	–	.000
N	190	190

From the analysis in Table 4.15, the Pearson correlation coefficient ($r = 0.812$) shows a strong positive relationship between biodegradable packaging and customer patronage. The coefficient of determination ($r^2 \approx 0.66$) indicates that 66% of the variation in customer patronage is explained by biodegradable packaging. With a significance value of 0.019 ($p < 0.05$), the relationship is statistically significant, leading to the rejection of the null hypothesis. This supports Magnier and Crié (2015), who argued that eco-friendly packaging enhances brand perception, loyalty, and purchase frequency. Likewise, Prakash and Pathak (2017) found that customers prefer brands demonstrating environmental

responsibility. For food and beverage firms in Yenagoa, biodegradable packaging not only supports sustainability goals but also strengthens competitiveness by attracting and retaining environmentally conscious customers.

Hypothesis Two

H0₂: There is no significant relationship between recyclable packaging and customer

patronage of food and beverage firms in Yenagoa, Bayelsa State.

Table 4.16: Statistical Analysis for Hypothesis Two

	Recyclable Packaging	Customer Patronage
Pearson Correlation (r)	1.000	.795
Sig. (2-tailed)	–	.000
N	190	190

From the result in Table 4.16, the Pearson correlation coefficient ($r = 0.794$) shows a strong positive relationship between recyclable packaging and customer patronage. The coefficient of determination ($r^2 \approx 0.63$) indicates that 63% of the variation in customer patronage is explained by recyclable packaging. The significance value of 0.022 ($p < 0.05$) confirms statistical significance, leading to the rejection of the null hypothesis. This aligns with Dangelico and Vocalelli (2017), who observed that recyclable packaging strengthens consumer attitudes toward brands by reflecting environmental responsibility. Likewise, Pauer et al. (2019) found that eco-conscious consumers prefer products with recyclable packaging. For food and beverage firms in Yenagoa, recyclable packaging not only supports environmental sustainability but also serves as a strategic advantage to attract and retain customers, thereby boosting competitiveness and consumer loyalty.

Conclusion and Recommendations

Conclusion

The study concludes that eco-product packaging significantly boosts customer patronage in Yenagoa's food and beverage sector. Firms using biodegradable, recyclable, and reusable packaging attract and retain eco-conscious consumers by demonstrating sustainability commitment, fostering trust, and enhancing brand loyalty. Biodegradable packaging reduces pollution while appealing to health-conscious buyers. Recyclable packaging signals environmental responsibility and supports global waste reduction goals. Reusable packaging adds functional and ecological value, encouraging repeat purchases and long-term brand ties. These results align with green marketing principles, showing that packaging choices go beyond operations to serve as strategic tools that shape consumer behavior and strengthen competitiveness.

Recommendations

Based on the findings, the following recommendations are made:

1. Food and beverage firms should prioritize biodegradable materials in their product packaging to appeal to eco-conscious customers and strengthen their environmental brand image.
2. Businesses should invest in recyclable packaging designs and communicate recycling instructions clearly on product labels to encourage customer participation in environmental sustainability.
3. Firms should introduce reusable packaging initiatives—such as returnable containers or refill programs—to promote customer loyalty and repeat purchases.

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