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Firm Characteristics and Environmental Sustainability Performance Disclosure in Nigerian Consumer Goods Manufacturing Companies

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Abstract: *This study investigates the relationship between firm characteristics and environmental sustainability performance disclosures in terms of pollution control, waste management, water management and energy efficiency. The study relied on Legitimacy, Stakeholder and Shareholders theories, and adopted causal comparative research design. Data were drawn from thirteen listed consumer goods manufacturing firms from 2012 to 2024, and analysed using the Generalized Least Squares (GLS) estimation technique. The results reveal that firm characteristics—specifically size, age, and financial leverage—are key drivers of environmental sustainability performance disclosure. Larger and older firms exhibit a greater capacity for adopting complex sustainability measures, while high financial leverage significantly constrains environmental performance disclosures as funds are applied in meeting debt obligations. The effect of profitability on environmental disclosures is negative, suggesting that most of the firms prioritize short-term gains over environmental investments that may produce gains in the distant future. Firms must look for more efficient strategies to deal with environmental concerns, and policies should be directed to incentivize firms to build environmental protection capacity and weather economic uncertainties that degrade business survival and growth.*

Keywords: *Environmental sustainability performance disclosure, Emissions and Pollution Control disclosure, Waste Management disclosure, Water Management disclosure, Energy Use and Efficiency disclosure*

1. INTRODUCTION

Environmental sustainability has emerged as a pivotal global concern, necessitating Environmental Sustainability Performance Disclosure (ESPD) as an essential corporate strategy; however, its implementation remains uneven across many businesses and countries. In Nigeria, the consumer goods manufacturing sector is a major economic player, but it is also a significant source of environmental challenges like waste, water pollution, carbon emissions, and energy inefficiency. As a result, ESPD is crucial for this industry. Recent research shows that, despite the environmental impact, ESPD practices are still in their early stages in Nigeria. In the absence of a detailed mandatory reporting framework, **environmental disclosures may be selective and cosmetic, and may be viewed as a label** meant to signal the reporting entity as environmentally responsible.

Due to its **high public profile** and substantial **environmental footprint, the Nigerian consumer goods industry** is a primary target for sustainability initiatives. As major producers of **waste and emissions,** the actions of companies in this sector are pivotal to the nation's broader environmental goals (Nnadi & Ekwere, 2022). Unlike in developed economies, where frameworks such as the Global Reporting Initiative (GRI) Standards and the Task Force on Climate-related Financial Disclosures (TCFD) are increasingly mandatory, Nigerian consumer goods companies often provide fragmented, self-reported environmental data through their annual reports or websites.

The drivers of ESPD in Nigeria are complex and multifaceted. While stakeholder pressures from international investors, environmental NGOs, and regulatory bodies like the National Environmental Standards and Regulations Enforcement Agency (NESREA) play a role, their impact has not translated to significant disclosure culture. Weak enforcement with limited institutional capacity, and low environmental awareness among domestic investors reduced the pressure for consistent disclosure. Given the above, many firms only disclose information reactively or to obtain to public attention.

Most research on environmental disclosures focused on their impact on profitability (Egwurube & Onyema, 2023; Ijaiya & Umar, 2020; Okoba et al., 2025). Some other studies have evaluated environmental liability disclosures in financial reports and their impact on earnings quality and equity value in Nigeria (Chukwu et al., 2020a; Chukwu et al., 2020b). A number of Nigerian studies have also explored the relationship between firm factors and environmental disclosures, but the results reported are not usually consistent (Egbunike & Chukwurah, 2023; Tanko et al., 2024).

Despite an increase in country-specific studies in Nigeria, a significant empirical gap remains concerning the consumer goods manufacturing sector. Most research works often combine various manufacturing sectors or focus on the oil and gas industry, which has different environmental footprints and stakeholder pressures. Limited studies specifically isolate consumer goods manufacturers or differentiate between the volume of disclosures and the actual reflection of sustainability performance within the context of firm factors. This study contributes to the literature seeking for drivers of environmental disclosures among firm factors, by focusing on consumer goods manufacturing firms and evaluating traditional firm factors; and thus, providing clarifying evidence on ESPD from an environmentally polluting sector in Nigeria.

The Nigerian context is also rapidly changing, with the new national roadmaps and anticipated mandatory environmental reporting standards. Therefore, it is essential to re-examine disclosure drivers and test whether traditional firm-level predictors hold up under evolving regulatory expectations and increased stakeholder scrutiny. This research provides a current and sector-specific analysis that contributes to the literature on corporate social responsibility and environmental governance in emerging economies.

2. LITERATURE REVIEW

2.1. Conceptual Review

2.1.1. Environmental Sustainability Performance Disclosure

Environmental Sustainability Performance Disclosure (ESPD) refers to the formal and informal communication of a firm's environmental strategies, practices, and outcomes to its stakeholders. The reports may be stand alone or integrated into other corporate reporting frameworks (Brennan & Merkl-Davies, 2014; Clarkson et al., 2008). One major problem of environmental reporting has been the lack of clearly mandated reporting framework. With issuance of environmental reporting standards, it is expected that there will be more commitment to environmental reporting.

Looking ahead, the demand for reliable, verifiable, and comparable ESPD will intensify as Nigeria advances its commitments under the Paris Agreement and Agenda 2030. Strengthening disclosure requirements and aligning with global standards are crucial for ensuring that corporate practices in Nigeria contribute meaningfully to the Sustainable Development Goals (SDGs), particularly SDG 12 (responsible consumption and production) and SDG 13 (climate action). For consumer goods, contributing to environmental concerns through energy use, pollution, waste production and water usage, robust ESPD is no longer an option but a strategic necessity.

2.1.2. Firm Characteristics.

Firm characteristics are attributes or features of a corporate entity. They are sometimes classified as financial and non-financial variables, and are recognized as central determinants of corporate behavior. In ESPD research, firm characteristics may be associated with the environmental responsiveness of reporting entities. There are a number of firm attributes examined in ESPD research. One of the frequently examined attributes is firm size, which is usually measured by number of employees, number of staff, or value of total assets. Another attribute is profitability, which broadly refers to a company's ability to generate earnings relative to its operating costs or assets. The relationship between a company's profitability and its commitment to **ESPD** is an ongoing debate with mixed findings. Thus, **financial success may or may not be associated with environmental transparency** (Ardi & Yulianto, 2020; Deswanto & Siregar, 2018), **Leverage,** defined as the extent to which a company relies on debt financing, maintains a complex and often conflicting relationship with environmental transparency. Drawing on **stakeholder theory**, it is expected that firms with high level of debt will disclose more environmental information to assure its creditors of its environmental commitment and responsibility. On the other hand, due to debt repayment obligations, such firms may withhold environmental

information as they may not have sufficient funds to address their environmental challenges. Another firm factor considered in this study is firm age, commonly measured by the number of years a company has been in operation or listed on the Stock Exchange. As with the other factors, the age of a firm may be positively or negatively associated with ESPD (Ayuba et al., 2024)

2.2. Theoretical review

The relationship between firm characteristics and ESPD is very central in corporate governance research. Firms do not disclose environmental information by chance; their choices are shaped by deeper theoretical logics that explain *why* and *how* such reporting occurs. Three dominant lenses—Legitimacy Theory, Stakeholder Theory, and Shareholder Theory—offer powerful insights into the strategic, social, and regulatory forces driving environmental disclosure.Legitimacy Theory offers a fundamental perspective for explaining why firms voluntarily disclose information. It is built on the concept that a firm operates under a "social contract": its ongoing survival hinges on aligning its activities with the values and expectations of the society it serves (Suchman, 1995). When corporate operations, particularly those with significant environmental consequences, are perceived as misaligned or illegitimate, the firm risks losing its "license to operate." Environmental disclosure, therefore, functions as a powerful strategic tool used to maintain, restore, or proactively enhance this crucial legitimacy. Environmentally sensitive firms may utilize ESPD to influence public concerns over environmental issues.

Stakeholder Theory emphasizes that a firm's long-term viability depends on effectively managing relationships with diverse groups, investors, regulators, employees, customers, and host communities (Freeman, 1984). Within this perspective, ESPD functions as a strategic communication mechanism, enabling firms to reduce conflicts of interest and demonstrate accountability to stakeholder concerns. Firm-specific characteristics significantly influence both the motivation and capacity to engage in such disclosure. For example, profitable firms possess greater financial flexibility to implement environmental initiatives and produce comprehensive reports (Ardi, 2020). Likewise, firms with higher leverage often disclose more extensively to reassure creditors that environmental risks are managed responsibly, thereby safeguarding financial stability (Akhter et al., 2022). On the other hand, shareholder theory, emphasizes the primacy of shareholders' interest, such that a reporting entity will be more concerned about profitability than environmental disclosures, even when such disclosures are desired by the other stakeholders.

2.3. Empirical review and hypotheses development

This section reviews the empirical studies relevant to the present research and presents the hypotheses for the study.

2.3.1. Firm size and Environmental Sustainability Performance Disclosure

Findings from a large number of studies have documented a significant positive relationship between firm size and ESPD (Akhter et al., 2022; Phoprachak & Buntornwon, 2020; Okoba & Chukwu, 2023a). This is not surprising as larger firms have higher profile and substantial impact; therefore, they face more intense scrutiny from stakeholders and the general public. This compels them to prioritize accountability in their environmental behavior. Also, they possess the financial resources required to tackle the inherently costly endeavor of environmental investments and reporting, making them far better equipped than their smaller counterparts to meet these demands (Wong et al., 2020). Accordingly, the first hypothesis of the study is formulated as follows.

H1: *Firm size has a significant positive effect on environmental sustainability performance disclosure*

2.3.2. Firm age and Environmental Sustainability Performance Disclosure

The relationship between a firm's age and ESPD is a subject of ongoing academic research. Firms with long history of operation may have good reporting resources, cordial relationship with regulatory bodies, and beneficial long-term bond with host communities. Dwi et al. (2022), Okoba and Chukwu (2023b) and Onyema et al. (2021) found a positive relationship between firm age and the quality of ESPD, suggesting that more established firms tend to provide higher-quality disclosures. It is also possible that older firms may be less adaptive to changes, and less sensitive to increasing environmental concerns, and this may result in a negative relationship (Ayuba et al., 2024). However, the weight of literature favours the following hypothesis.

H2: *Firm age has a significant positive effect on environmental sustainability performance disclosure*

2.3.3. Financial leverage and Environmental Sustainability Performance Disclosure

Evidence from literature suggest high leverage may constrain indebted firms to faithfully disclose their environmental performance, if only to convince shareholders and debt holders of their transparency. Thus, a positive relation can be observed between leverage and ESPD (Ayuba et al., 2024). On the other hand, high leverage may impede the ability of firms to embark on costly environmental interventions and reporting, as managers may feel constrained to hide poor environmental performance. Accordingly, Ardi (2020) and Kipngetich et al. (2019) reported that leverage has a significant negative effect on ESPD. The above leads to the following hypothesis.

H3: *Firm leverage has a significant negative effect on environmental sustainability performance disclosure*

2.3.4. Profitability and Environmental Sustainability Performance Disclosure

Profitability is often assumed to be a key driver of environmental sustainability performance disclosure, yet available evidence is not consistent. While some studies suggest that financial success encourages transparency, others reveal weak or even negative relationship. For instance, Orazulike and Orji (2024) established a **positive and significant relationship** between profitability and ESPD, contending that financially successful organizations are **better equipped to allocate resources** toward comprehensive reporting as a strategic means of **enhancing corporate reputation**. In contrast, some other studies (Ardi & Yulianto, 2021; Deswanto & Siregar, 2018) have reported a negative but insignificant relationship between profitability and ESPD, suggesting that firms' pursuit of profitability may not coincide with environmental responsibility. In fact, investment in environmental issues may impinge on profitability especially in a depressed economy. Based on the above, the fourth hypothesis s developed as follows.

H4: *The relationship between profitability and environmental sustainability performance disclosure is negative and significant*

3. METHODOLOGY

3.1. Data and Model

This study adopted a causal comparative research design within a positivist paradigm, relying on secondary data drawn from two primary sources: (i) annual reports and sustainability reports, and (ii) audited financial statements. The study ESPD data from **content analysis** of the firms' annual and sustainability reports. The extent of disclosure was measured using a standardized scoring framework based on the Global Reporting Initiative (GRI) guidelines.

The study's data acquisition followed a systematic approach. Information on firm characteristics - specifically **firm size,** age, **profitability**, and **financial leverage** - was extracted directly from the **audited financial statements** of the sampled companies. A **purposive sampling technique** was employed to select thirteen (13) consumer goods manufacturing firms from the twenty publicly listed firms in that sector on the Nigerian Exchange Group (NGX). The selection of the final sample was strictly dependent on the **availability of complete data** across the entire study period, spanning 2012 to 2024.

This study develops analytical models to investigate how firm characteristics influence ESPD. The models consider four disclosure dimensions—emissions and pollution control, waste management, water management, and energy use and efficiency—as dependent variables. And firm size, firm age, financial leverage, profitability, serve as explanatory variables, while audit quality, and institutional ownership are control variables. The models are as follows:

$EPC_{it}=\beta_0+\beta_1 FMSZ_it+\beta_2 FAGE_{it}+\beta_3 FLEV_{it}+\beta_4 PROF_{it}+\gamma_1 AUDQ_{it}+\gamma_2 INSTOWN_{it}+\varepsilon_{it}$-------- (1)

$WSTM_{it}=\beta_0+\beta_1 FMSZ_{it}+\beta 2 FAGE_{it}+\beta_3 FLEV_{it}+\beta_4 PROF_{it}+\gamma_1 AUDQ_{it}+\gamma_2 INSTOWN_{it}+\varepsilon_{it}$----- (2)

$WATMit=\beta_0+\beta_1 FMSZ_{it}+\beta_2 FAGE_{it}+\beta_3 FLEV_{it}+\beta_4 PROF_{it}+\gamma_1 AUDQ_{it}+\gamma_2 INSTOWNit+\varepsilon_{it}$------ (3)

$EUE_{it}=\beta_0+\beta_1 FMSZ_{it}+\beta_2 FAGE_{it}+\beta_3 FLEV_{it}+\beta_4 PROF_{it}+\gamma_1 AUDQ_{it}+\gamma_2 INSTOWNit+\varepsilon_{it}$--------- (4)

Where:

EPC = Emissions and Pollution Control disclosure

WSTM = Waste Management disclosure
WATM = Water Management disclosure
EUE = Energy Use and Efficiency disclosure
FMSZ = Firm Size (Natural log of Total Assets)
FAGE = Firm Age (Number of years since incorporation)
FLEV = Financial Leverage
PROF = Profitability (ROA = Net Income ÷ Total Assets)
AUDQ = Audit Quality (1 = Big-4 auditor; 0 = otherwise)
INSTOWN = Institutional Ownership (% of shares held by institutional investors)
β_0 = Intercept
β_1, β_2, β_3, β_4 = Coefficients of explanatory variables
γ_1, γ_2 = Coefficients of control variables
ε = Error term
i = ith company
t = period
The environmental sustainability performance disclosure index

$$ESPD = \sum_{j=0}^{n} dj$$

Where:

dj=0 if the j-th item is **not disclosed**

dj=1 if the j-th item is **poorly disclosed**

dj=2 if the j-th item is **moderately disclosed**

dj=3 if the j-th item is **comprehensively disclosed**

n= Total number of disclosure items expected

i = ith company

t = period

Table 1. *Variable Definition and Measurement*

Variable	Code	Definition /Measurement	Data Source
Dependent Variable			
Environmental Sustainability Performance Disclosure	ESPD	Measured through content analysis of annual and sustainability reports, using a disclosure index based on GRI guidelines (score = total items disclosed ÷ total applicable items).	Annual & Sustainability Reports
Independent Variables Firm Size	FMSZ	Natural logarithm of total assets.	Audited Financial Statements
Firm Age	FAGE	Number of years since incorporation.	NGX & Company Reports
Financial Leverage	FLEV	Ratio of total debt to total equity (Debt ÷ Equity).	Audited Financial Statements
Profitability	PROF	Return on Assets (ROA) = Net Income ÷ Total Assets.	Audited Financial Statements
Control Variables Audit Quality	AUDQ	Dummy variable: 1 if firm is audited by a Big-4 auditor (PwC, EY, Deloitte, KPMG); 0 otherwise.	Annual Reports (Audit Notes)
Institutional Ownership	INSTOWN	Percentage of shares held by institutional investors (or dummy = 1 if > median).	NGX Factbook & Annual Reports

4. DATA ANALYSIS AND RESULTS

4.1. Univariate Analysis

This section presents the descriptive statistics of the study variables. As shown in Table 2, the dataset comprises 169 firm-year observations, representing 13 listed consumer goods firms over a 13-year period.

Table 2. *Descriptive Statistics*

	Obs	Mean	Std. Dev.	Min.	Max
EPC	169	0.248	0.213	0	0.833
WATM	169	0.337	0.270	0	1.000
WSTM	169	0.295	0.222	0	0.833
EUE	169	0.316	0.211	0	0.833
FMSZ	169	17.80	2.045	0.41	21.12
FAGE	169	60.69	24.05	13	125
FLEV	169	0.749	0.368	-0.157	2.258
PROF	169	0.057	0.121	-0.307	0.918
AUDQ	169	0.863	0.344	0	1
INSTOWN	169	0.786	0.411	0	1

Source: STATA 15

The descriptive results indicate that environmental disclosure among sampled firms is generally low. The composite environmental performance (EPC, mean = 0.25) and its dimensions—energy use and efficiency (EUE, 0.32), water management (WATM, 0.34), and waste management (WSTM, 0.30)—suggest limited reporting. Firm size (mean = 17.8) and age (mean = 61 years) vary considerably, implying heterogeneity that may influence disclosure. Larger and older firms often face greater stakeholder scrutiny, making them more likely to report environmental practices. Leverage (mean = 0.75) is moderate.

4.2. Diagnostic tests

The Variance Inflation Factor (VIF) values for all variables are well below the commonly accepted threshold of 10. Specifically, **firm size (FMSZ)** and **firm age (FAGE)** have the highest VIFs (2.90 and 2.53, respectively), but these still fall within an acceptable range, suggesting only mild correlation with other predictors. All other variables (FLEV, PROF, AUDQ, INSTOWN) have VIFs close to 1, indicating negligible multicollinearity. The **mean VIF of 1.64** further confirms that multicollinearity is not a concern in the model (Gujarati & Porter, 2009).

Table 3. *Multicollinearity Test (VIF Analysis)*

Variable	VIF	1/VIF
FMSZ	2.90	0.345224
FAGE	2.53	0.395438
FLEV	1.18	0.846222
PROF	1.14	0.878313
AUDQ	1.04	0.959778
INSTOWN	1.04	0.961741
Mean VIF	1.64	

Source: STATA 15

Table 4. *Breusch and Pagan Lagrangian multiplier model selection test*

EPC model			**WSTM model**		
	Var	sd = sqrt (Var)		Var	sd = sqrt (Var)
EPC	.446922	.2114052	WSTM	.0455713	.2134744
E	.0106959	.1034211	E	.0067495	.0821554
U	.0104557	.102253	U	.0095955	.0979566
Test: Var(u) = 0			Test: Var(u) = 0		
chibar2(01) = 59.80			chibar2(01) = 50.86		
Prob > chibar2 = 0.0000			Prob > chibar2 = 0.0000		

Decision: Reject Pooled Regressions			Decision: Reject Pooled Regressions		
WATM model			**EUE model**		
	Var	sd = sqrt (Var)		Var	sd = sqrt (Var)
WATM	.073011	.2702055	EUE	.0497228	.2229861
E	.0082211	.0906702	E	.009572	.0978365
U	.0115623	.1075281	U	.0057734	.0759829
Test: Var(u) = 0			Test: Var(u) = 0		
chibar2(01) = 34.49			chibar2(01) = 32.91		
Prob > chibar2 = 0.0000			Prob > chibar2 = 0.0000		
Decision: Reject Pooled Regressions			Decision: Reject Pooled Regressions		

Source: STATA 15

The study conducted regression diagnostics to choose the appropriate analytical model. The first test was to choose between pooled regression and random effect model, using the Breusch and Pagan Lagrangian multiplier test for random effects. For all models (EPC, WSTM, WATM, and EUE) shown in Table 4, the **LM test** was statistically significant, with a p-value of 0.0000. Since this p-value is less than the significance level of 0.05, we **reject the null hypothesis**, which states that there is no variance in the unit-specific error term (i.e., Var(u)=0). Therefore, because the LM test results indicate that significant variance exists, **pooled OLS regression is inappropriate for these models**. It suggests that a panel data approach that accounts for individual unit effects would be more suitable.

Table 5. *Hausman Specification Test to choose between FEM and REM*

EPC model					**WSTM model**			
	fe	Re	Difference	S.E.	Fe	re	Difference	S.E.
FMSZ	-.0007	.0147	-.0140	.0020	-.0034	.0150	-.0184	.0021
FAGE	.0291	.0069	.0222	.0028	.0450	.0130	.0320	.0030
FLEV	-.0329	-.1171	.0842	.0107	-.0115	-.1295	.1180	.0116
PROF	-.0596	-.2600	.2004	.0320	.0829	-.1510	.2339	.0333
AUDQ	-.1723	-.0280	-.1445	.	-.0697	.2179	-.2876	.
chi2(5) = 66.56					chi2(5) = 113.61			
Prob>chi2 = 0.0000					Prob>chi2 = 0.0000			
Decision; Use FEM					Decision; Use FEM			

WATM model					**EUE model**			
	fe	Re	Difference	S.E.	Fe	re	Difference	S.E.
FMSZ	-.0030	.0209	-.0239	.0026	-.0069	.0156	-.00225	.0027
FAGE	.0577	.0173	.0404	.0037	.0418	.0061	.0357	.0036
FLEV	-.0250	-.1733	.1483	.0142	.0055	-.1272	.3003	.0136
PROF	.0493	-.2316	.2812	.0408	.0149	-.2853	.2339	.0429
AUDQ	.0199	.3129	-.2930	.	-.2055	.0332	-.2387	.
chi2(5) = 123.02					chi2(5) = 102.01			
Prob>chi2 = 0.0000					Prob>chi2 = 0.0000			
Decision; Use FEM					Decision; Use FEM			

Source : STATA 15

The Breusch–Pagan LM test confirmed the presence of panel effects, indicating that pooled OLS is inappropriate. The Hausman test results for all four models further supported the use of the Fixed Effects model, as the p-values were consistently below the 0.05 significance level. This suggests that the Fixed Effects estimator offers more consistent and reliable results than the Random Effects alternative in capturing variations within the panel data.

4.3. Results of regression analysis

The results presented in Table 6 show that the models are significant. The **Wald chi-square statistic** range from 39.25 to 112.70 with p-value less than 0.001 in each case, confirming that the **explanatory variables**, along with the control variables, collectively have a statistically significant effect on **each of the dependent variables** in the four models.

Firm Size (FMSZ) is positively associated with environmental sustainability performance disclosures (ESPD) in all the four measures of ESPD. The relationship is statistically significant at the 5 per cent

level when ESPD is measured by emissions and pollution control disclosures (EPC), water management disclosures (WATM), and energy use and efficiency disclosures (EUE), but in the case of waste management disclosures (WSTM), the significance is at the 10 per cent level. Overall, hypothesis 1, which suggests that firm size has a significant positive effect on environmental disclosure (ESPD) is supported.

Firm age (FAGE) is positively associated with environmental sustainability performance disclosures (ESPD) in all the four models. In the first three models, EPC, WSTM and WATM, the relationship is significant at 5 per cent level. However, when ESPD is measured by energy use and efficiency disclosures (EUE), the relationship, though positive, is insignificant. Put together, hypothesis 2, which proposes that firm age has a significant positive effect on environmental disclosure (ESPD) is supported.

Financial leverage (FLEV) is negatively associated with environmental sustainability performance disclosures (ESPD). In all the four measures of ESPD, the relationship is statistically significant at the 5 per cent level. Thus, hypothesis 3, which states that financial leverage has a significant negative effect on environmental sustainability disclosures (ESPD) is supported statistically.

Profitability (PROF) is negatively associated with environmental sustainability performance disclosures (ESPD) in all the four models. When ESPD is measured by emissions and pollution control disclosures (EPC) and energy use and efficiency disclosures (EUE), the relationship is statistically significant. But when ESPD is measured by water management disclosures (WATM) or case of waste management disclosures (WSTM), relationship is not statistically significant. It is noteworthy that all the ESPD measures, the association between profitability and ESPD is negative. Therefore, hypothesis 4 which proposes that the "relationship between profitability and environmental sustainability performance disclosure is negative and significant" is partially supported as the coefficient in all the models are negative and two of the four models are statistically significant.

Table 6. *Results of GLS regression of the EPC, WSTM, WATM and EUE models*

Coefficients:	Generalized Least Squares				Number of obs.		169	
Panels:	Homoscedastic							
Correlation:	no autocorrelation							
Estimated covariances			=	1	Number of groups		13	
Estimated autocorrelations			=	0	Time periods		13	
Estimated coefficients			=	7				
	EPC Model		**WSTM Model**		**WATM Model**		**EUE Model**	
	z	**P>|z|**	**Z**	**P>|z|**	**z**	**P>|z|**	**z**	**P>|z|**
FMSZ	5.17	0.000	1.69	0.091	2.97	0.003	3.03	0.002
FAGE	3.18	0.001	2.71	0.007	4.47	0.000	1.38	0.168
FLEV	-3.66	0.000	-.3.60	0.000	-3.91	0.000	-3.18	0.001
PROF	-2.85	0.004	-.0.70	0.484	-0.83	0.405	-2.42	0.016
AUDQ	0.56	0.575	0.65	0.514	0.49	0.621	0.60	0.546
INSTOWN	2.56	0.011	1.14	0.254	0.95	0.340	2.61	0.009
_cons	-.3.31	0.001	-0.51	0.608	-1.75	0.000	-1.48	0.139
Summary								
Wald chi2(6)	112.70		39.25		59.98		70.39	
Prob > chi2	0.000		0.000		0.000		0.000	
Log likelihood	66.499		39,323		7.515		43.731	

4.4. Discussion of findings

As shown in Table 6, all the predictors in the EPC model are significantly associated with environmental sustainability performance disclosure (ESPD). The positive association of firm size with EPC suggests that larger firms have stronger financial capacity to implement emission and pollution control interventions that positively impact the environment, and they possess better accounting expertise to disclose environmental performance. It is for this same reason that firm size is positively associated with energy use and efficiency as well as water management disclosures**. A number of prior studies are consistent with this finding and view point (**Akhter et al., 2022; Phoprachak & Buntornwon, 2020; **Okoba & Chukwu, 2023a). In the case of** waste management disclosure (WSTM), the positive effect of firm size is only marginal at 10 per cent (p = 0.91). This shows that smaller firms are also actively involved in waste management endeavors. With increasing

emphasis on circular economy and many businesses (including modest-size businesses) getting involved in waste recycling, activities in that sector no longer depend on the size of the firm. This is why the effect of firm size on WSTM is marginally significant.

Firm age is also positively and significantly associated with all the measures of ESPD except energy use efficiency (EUE). The results indicate that older and larger firms align their environmental activities to agree with societal perceptions in order to maintain social legitimacy in their operational communities. This is possibly because they are subject to more stringent stakeholder scrutiny than smaller and younger firms. Prior studies are consistent with these findings and assertions (**Dwi et al., 2022; Okoba & Chukwu, 2023b). The insignificant relationship between firm age and EUE may be explained by the energy sources of older firms which may not be as efficient as those of newer firms. The bureaucratic practices of long-established firms may be resistant to changes and transition to more efficient processes.**

Leverage (FLEV) is negatively and significantly associated with all measures of environmental sustainability performance disclosures (ESPD). This is firms with high financial leverage may not have the resources to invest in costly environmental initiatives as they need funds to service their debt obligations. This finding is not consistent with the Stakeholders theory which suggests that high leveraged firms are constrained to disclose their environmental performance, in order to convince stakeholders about the credibility of their commitment and accounting numbers. The current study shows that financial constraints exert a strong limiting effect on firms' environmental responsibility as it crowds out funds that could have used for environmental investments. This finding is consistent with a number of prior studies (Ardi, 2020; Kipngetich et al., 2019; Sari & Nugroho, 2022). The poor environmental performance of high leveraged firms in Nigeria may be a matter of survival as a number of consumer goods firms in Nigeria are not financially healthy (Alhaji, 2023). Given a poor state of financial health, a firm will likely shy away from environmental investments and the related disclosures.

Profitability (PROF) is negatively, and significantly associated with EPC and EUE, but insignificantly associated with WSTM and WATM. The negative relationship between profitability and measures of environmental sustainability performance disclosures suggests that profitable firms are more interested in achieving short-term financial goals than in investing in environmental initiatives. The insignificant relationship between profitability and waste/water management disclosures may suggest that environmental processes of waste management and water management are currently not efficient, suggesting the need for more cost-saving technologies.

5. CONCLUSION

Concern over the environmental impact of corporate activities has received several attentions in academic fields and environmentally victim communities in Nigeria. Activities of consumer goods manufacturing degrade the environment hosting their plants, and some firms invest in a number of initiatives to manage the environmental challenges. Disclosure of environmental sustainability performance is desirable to convince the stakeholders of the social legitimacy of the reporting entity. The object of the current study was to ascertain how firm characteristics are associated with environmental disclosures in respect of emissions and pollution control, waste management, water management and efficiency in energy use. Based data from thirteen consumer goods manufacturing companies over the period 2012 to 2024, analysed using **Generalized Least Squares (GLS) estimation**, the study found that firm attributes are significantly associated with environmental disclosures. Specifically, firm size correlate positively with environmental sustainability performance disclosures (ESPD), accordingly, the study concludes that larger firms are better positioned resource wise to initiate and implement environmental protection strategies, and disclose their environmental performance in their periodic reports.

The evidence also revealed firm age correlate positively with ESPD, leading also to the conclusion that older firms are more interested in ESPD, possibly because of legitimacy and stakeholder concerns, and the need to protect long-term reputation of environmental responsibility. But leverage was negatively associated with ESPD leading to the conclusion that financial constraint experienced by high debt firms crowd out funds for environmental investments, because of the need to meet debt obligations. As with leverage, the study revealed a negative association between profitability and ESPD. Nigerian firms are more interested in short term financial performance, than in future gain that may result from costly environmental investments.

The overall evidence indicates that firm size and firm age are positively associated with environmental disclosures (ESPD) while leverage and profitability are negatively related with ESPD in Nigerian consumer goods manufacturing sector. In the case of profitability, it is important to note that in recent years the economic downturn in the country has led to the collapse of some businesses in the consumer goods manufacturing sector or substantial scale down of operations. (Alhaji, 2023). In such circumstances, businesses will strive for survival by focusing on activities that generate income within the current period, not ones that will engulf huge expenditure in anticipation of future cost-saving or income in the distant future. For this reason, firms interested in profit-making did not investment so much in environmental disclosures. They were more interested in preserving shareholders wealth (consistent with Shareholders theory), than in achieving social legitimacy.

It is therefore recommended that government regulators should insist on environmental reporting, to compel environmental disclosures. Firms in polluting industries should implement efficient environmental to save cost, while achieving environmental responsibility.

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