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ENVIRONMENTAL PERFORMANCE AND VALUE OF LISTED INDUSTRIAL GOODS FIRMS IN NIGERIA: MEDIATING THROUGH FINANCIAL PERFORMANCE

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Abstract

This study examined the mediating effect of financial performance on the relationship between environmental performance and value of listed industrial goods firms in Nigeria. Data for the study was extracted from the annual reports and accounts of the sampled firms for the period of fourteen (14) years (2010-2023). The data collected was analyzed using descriptive statistics to provide summary statistics for the variables, while correlation analysis was carried out to assess the correlation between the dependent and explanatory variables. Structural Equation Modeling (SEM) was used to estimates the relationship between environmental performance and firm value, and subsequently, to test significance of indirect effects the path model (Monte Carlo simulation) approaches was employed for mediation analysis. The study found that Employee Health and Safety Cost (EHSC) one of the proxies of environmental performance influences financial performance. More so, Staff Development Cost (SDC) as proxy for environmental performance affects value of listed industrial goods firms in Nigeria. In the same vein, financial performance has insignificant impact on firm value of the sampled firms and financial performance is not proven as a variable that mediates the relationship between environmental performances on firm value. The study recommends that the management of listed industrial goods companies in Nigeria should prioritize and invest in environmental initiatives, recognizing that strong environmental performance can directly enhance firm value. Finally, management should invest in staff training and development focused on sustainability can equip employees with the skills necessary to implement and manage environmental initiatives effectively.

Keywords: *Environmental performance, financial performance, value in Nigerian industrial goods firms*

INTRODUCTION

Investors place significant importance on organizational value as it serves as a key indicator of a firm's success both locally and internationally. Market value reflects the overall worth of the company, providing a comprehensive representation of its financial health, operational efficiency, and potential for growth. It is crucial for investors, stakeholders, and management as it reflects the company's financial health, growth potential, and ability to generate returns. Therefore, in today's competitive business era, increasing company value has become a primary focus for many organizations (Indriastuti & Kartika, 2021). Conversely, environmental

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performance is emerging as a critical concern in today's business landscape (Sisdianto et al., 2023).

Businesses are under pressure to understand their impact on the environment and to be socially and ecologically responsible. Environmental performance is becoming a must for businesses that want to preserve their brand and continue operating, as a result of climate change and growing public knowledge of environmental issues (Yuniarta et al., 2023). Environmental performance costs encompass the total annual expenditures on waste management, community development, health and safety fees, and pollution-related expenses. Environmental performance can significantly impact firm value because investors increasingly recognize the importance of sustainability and environmental responsibility as key indicators of a company's long-term viability and risk profile (Li et al., 2024*)*. Financial performance significantly influences firm value as it reflects a company's ability to generate profits, manage resources efficiently, and sustain growth (Sucuahi & Cambarihan, 2016).

Strong financial performance indicates healthy revenue streams, cost efficiency, and robust profitability, which attract investors and enhance market confidence. It also demonstrates the firm's capacity to meet its obligations, reinvest in operations, and pay dividends, further increasing its appeal to shareholders. Additionally, consistent financial performance reduces perceived risk, positively impacting the firm's valuation in the eyes of investors and stakeholders. Ultimately, a solid financial foundation serves as a critical driver of firm value, ensuring long-term stability and competitiveness (Sucuahi & Cambarihan, 2016). More often than not, company's commitment to the environment can lead to high profitability, attracts investor interest, which ultimately enhances overall firm value. More so, as strong environmental performance, such as reducing emissions, efficient resource usage, and compliance with environmental regulations, often leads to cost savings, enhanced operational efficiency, and increased market appeal (Patima et al., 2024). These improvements boost financial performance, reflected in higher profitability and better returns on investment. In turn, robust financial performance signals stability and growth potential to investors, positively influencing firm value.

In the Nigerian context, environmental challenges such as pollution, waste mismanagement, and deforestation are prevalent, with industrial activities being a significant contributor (Ebong et al., 2023). Many companies especially Nigerian firms, only focus on achieving optimal performance levels but do not pay attention to the environmental impact of their activities or operating processes, whereas in some reports, it is found that many companies ignore environmental impacts (Enekwe et al., 2023). The government has implemented various regulatory measures, such as the Environmental Impact Assessment (EIA) Act and other environmental policies, to ensure compliance with sustainable practices (Nuwahereza, 2024). The relationship between environmental performance and firm value has garnered increasing attention globally due to the rising awareness of sustainability issues and their implications for business operations (Li et al., 2024).

In recent years, firms are increasingly expected to integrate environmental sustainability into their strategic goals to address growing concerns over climate change, resource depletion, and environmental degradation (Triwahyuni et al., 2022). For industrial goods firms, whose operations often have a significant environmental footprint, such expectations are even more pronounced. These firms are frequently required to adopt sustainable practices such as waste reduction, efficient resource utilization, emissions control, and compliance with environmental regulations. However, the extent to which these efforts translate into value creation for firms

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remains a critical area of investigation. Empirical research on the influence environmental performance on firm value has been carried out locally and international the noticeable studies include Abdullahi and Muhammad (2023) in Nigeria, Triwahyuni et al. (2022) in Indonesia, Wu et al. (2022), Darmayoga et al. (2020) in Jordan, Fauziyyah (2019) in Indonesia and Ratri and Dewi (2017) in Jakarta. Majority concluded that environmental performance has a significant effect on firm value.

While several studies have explored the direct impact of environmental performance on financial performance, particularly in developing economies this includes Major and Nwdighoha (2024) in Nigeria, Ubokudom et al. (2024) in Nigeria, Enekwe et al. (2023) in Nigeria, Sisdianto et al. (2023) in Indonesia, Ibeanu et al. (2023) in Nigeria, Lawrence and Bernard (2023) in Nigeria, Seun et al. (2023) in Nigeria, Akinleye (2022) in Nigeria and Triwahyuni et al. (2022) in Indonesia. Financial performance can also affects firm value, Al-Omari et al. (2024) in Jordan, Setiawanta et al. (2021) in Indonesia, Machali (2020) in Indonesia, Musa and Ibrahim (2017) from developing countries, Ratri and Dewi (2017) in Jakarta, and Sucuahi and Cambarihan (2016) in Philippines concluded that financial performance influence firm value. The company's value will increase in a sustainable manner if the company is able to improve its financial performance.

Previous research has yielded mixed results regarding the mediating effect of financial performance on the relationship between environmental performance and firm value. Studies such as those by Asriani et al. (2024), Patima et al. (2024), Mutmainah and Sitawati (2023), Sudimas et al. (2023), Fauzi (2022), Aini and Faisal (2021), Nurul and Faisal (2021) and Fauziyyah (2019), all conducted in Indonesia, reflect this variability. The lack of consensus in academia highlights the need for more comprehensive investigations into how financial performance mediates the relationship between environmental performance and firm value. Few studies have explored financial performance as a mediating factor between environmental performance and firm value in Nigeria, leaving a gap in understanding how environmental practices influence firm value, especially when direct benefits are not immediately apparent. Limited research has analyzed the impact of environmental performance on firm value through financial performance. This paper addresses this gap by examining the effects of environmental performance on firm value and assessing the mediating role of financial performance in listed industrial goods firms in Nigeria

Thus, understanding this relationship in the Nigerian industrial sector is essential for providing actionable insights for policymakers, investors, and corporate leaders. This study seeks to bridge the gap by examining how environmental performance impacts the value of listed industrial goods firms in Nigeria, with financial performance serving as a mediating factor. It contributes to the growing body of literature on sustainability and firm performance by providing empirical evidence within the context of a developing economy, where such dynamics may differ significantly from those observed in developed markets. The literature indicates that while study has been done in this field, little is known about how environmental performance interacts with financial performance to affect business value, particularly for industrial goods companies. By providing a more thorough and in-depth explanation of this link, this study seeks to close this knowledge gap. This study seeks to address the research gap in the Nigerian industrial sector by examining the relationship between environmental performance and firm value in listed industrial goods firms, focusing on the mediating role of financial performance. Understanding this relationship is crucial for informing corporate strategies and policymaking to foster sustainable industrial growth and enhance firm value. The

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paper is structured as follows: Section 2 reviews the literature and develops the hypotheses, Section 3 outlines the methodology, Section 4 presents the empirical results, and Section 5 concludes with discussions.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Environmental Performance and Firm Value

Businesses that are able to consider social and environmental issues will generate a favorable impression and be regarded as excellent businesses. The state of the environment can affect how the public perceives a company and how well it performs. Investors and the community will benefit if the business pays attention to ethical environmental concerns in order to boost the firm value (Fauzi, 2022). Previous studies from developing and developed economies supported the significant impact of environmental performance on firm value (Patima et al., 2024; Sudimas et al., 2023; Wu et al., 2022; Darmayoga et al., 2020; Wahidahwati & Ardini, 2021, Budiharjo, 2019). This is in line with legitimacy theory, which suggests that firms seek to ensure their actions are perceived as legitimate by society. Strong environmental performance helps firms maintain legitimacy, avoid public criticism, and reduce risks of regulatory penalties, all of which positively affect firm value and companies with good environmental performance tend to gain additional legitimacy from stakeholders because they are considered to operate with high social and environmental responsibility **(**Dowling & Pfeffer, 1975**).**

On the order hands, Asriani et al. (2024), Mutmainah and Sitawati (2023), Soedjatmiko et al. (2021), Rinsman and Prasetyo (2020), Suminar (2018) and Ratri and Dewi (2017) documented differs from a study by environmental performance has no effect on firm value. This contradicts the idea in legitimacy theory that aligning with societal values will result in enhanced firm reputation and value. Legitimacy theory emphasizes the importance of complying with societal norms to maintain a favorable reputation. If environmental performance is not associated with firm value, it raises questions about whether compliance with environmental standards is genuinely valued by the market or merely seen as a cost of doing business, thus challenging the underlying assumptions of legitimacy theory. This finding could lead stakeholders to question the effectiveness of a company's environmental strategies. If environmental performance does not correlate with firm value, stakeholders may doubt whether the company's sustainability practices are genuinely beneficial or if they are just for show. Based on the explanation above, the following hypothesis is formulated.

$H0_1$: Environmental performance has insignificant impact on value of listed industrial goods companies in Nigeria.

2.2 Environmental Performance and Financial Performance

Businesses that practice environmental performance are also demonstrating their accountability to stakeholders. Relationships between businesses and the communities where they operate are strengthened by corporate social responsibility and environmental stewardship. According to Aggarwal (2013), disregarding the interests of stakeholders may damage the company's reputation, which will hurt its bottom line. Many studies have examined the impact of environmental performance on financial performance in one way and another; this includes Azeem et al. (2024) in Pakistan, Major and Nwdighoha (2024) in Nigeria, Ubokudom et al. (2024) in Nigeria, Abdullahi and Muhammad (2023) in Nigeria, Enekwe et al. (2023) in

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Nigeria, Ibeanu et al. (2023) in Nigeria, Lawrence and Bernard (2023) in Nigeria, Rani et al. (2023) in Indonesia, Septiavin et al. (2023) in Indonesia, Seun et al. (2023) in Nigeria and Triwahyuni, et al. (2022) in Indonesia. However, these previous study employed various approaches, methods, periods, and types of companies examined, so the results obtained between researchers are different. Therefore, there are some contradictions that need to be confirmed.

Contradictory findings related to research on the impact of environmental performance on financial performance can be summarized into two groups, those that documented significant and otherwise. Azeem et al. (2024), Major and Nwdighoha (2024), Abdullahi and Muhammad (2023), Ibeanu et al. (2023), Lawrence and Bernard (2023), Rani et al. (2023), Seun et al. (2023) and Triwahyuni, et al. (2022) documented significant relationship between environmental performance and financial performance. On the other hand Ubokudom et al. (2024), Enekwe et al. (2023) and Septiavin et al. (2023) concluded that environmental performance has insignificant impact on financial performance. However, the results from those studies have been unlimited and inconsistence. Again, not much attempt has been made here in Nigeria to study the impact of environmental performance on financial performance. Based on the explanation and inconsistence in the results, the null hypothesis two is that:

$H0_2$: Environmental performance has insignificant impact on financial performance of listed industrial goods companies in Nigeria.

2.3 Financial Performance and Firm Value

The company's value does not increase if the level of company performance, especially the company's financial performance, does not increase (Sudimas et al., 2023). Financial performance in a company can be assessed by how optimally the company generates profit or profit from all operating activities. If a company can obtain or achieve optimal company profits, it will directly impact the level of business continuity. Today, many companies only focus on achieving optimal performance levels but do not pay attention to the environmental impact of their activities or operating processes, whereas in some reports, it is found that many companies ignore environmental impacts **(**Triwahyuni et al., 2022).

Al-Omari et al. (2024), Sudimas et al. (2023), Wu et al. (2022), Fauziyyah's (2019), Liniarti (2019), Musa and Ibrahim (2017) and Putri (2015) showed that financial performance influences company value which is in line with signal theory, it states that management will try to increase the worth of financial performance (return on assets) in order to provide information on the market where this is expected to increase the value of the company, in other words, the greater the financial performance, the more it increases company value. Different from previous research results, Musa and Ibrahim (2017) documented insignificant relationship between financial performance and firm value. So the third hypothesis of this study is as follows:

$H0_3$: Financial performance has insignificant impact on value of listed industrial goods companies in Nigeria.

2.4 Environmental Performance, Financial Performance and Firm Value

Environmental performance costs reflect a company's social responsibility, enhancing its image and gaining stakeholder support related to environmental issues, which can lead to increased financial performance and lead to firm value. Investors may value a company's commitment to

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environmental stewardship when it discloses environmental costs, which could raise the value of the company's shares (Patima et al., 2024). Environmental conditions can have an impact on a company's performance and public perception. In order to increase the firm's value, businesses that prioritize ethical environmental concerns will benefit investors and the community (Fauzi, 2022). Mediating effect of financial performance on the relationship between environmental performance and value has been widely studied in both developed and developing countries; their results showed mix findings.

Asriani et al. (2024) examined the influence of intellectual capital and environmental performance on firm value with financial performance as an intervening variable of listed manufacturing firms in Indonesia. The population of this study consist listed manufacturing companies on the Indonesian Stock Exchange (BEI) for a period of five (2018-2022). Thirty (30) manufacturing firms were chosen out of the total population for the period under study. Data analysis was conducted using SEM-PLS (Structural Equation Modeling-Partial Least Squares) with Smart PLS software version 3.0. The results reveal that environmental performance does not significantly influence financial performance or firm value. Furthermore, financial performance does not mediate the relationship between environmental performance and firm value.

Patima et al. (2024) assessed the relationship between environmental accounting and firm value with profitability as a mediating variable. The study used eighteen listed materials companies on the Indonesia Stock Exchange (IDX) for three-years (2021-2023). For the purposes of the analysis, path and Sobel analysis based on secondary panel data were used. The results show that environmental costs and environmental performance influence firm value. Meanwhile, environmental disclosure has no effect on firm value. Apart from that, environmental costs, environmental performance and environmental disclosure cannot influence firm value with profitability as an intervening variable. More so, this finding is in line with research conducted by Hayatul et al. (2023), which shows that profitability does not yet mediate the impact of green accounting on firm value, Sudimas et al. (2023) also concluded that the relationship between environmental performance and firm value does not mediated by financial performance of listed companies in Indonesia.

Aini and Faisal (2021) investigated the effect of environmental performance on firm value with financial performance as a mediator variable. The study employed quantitative research while population consists of forty-seven non-financial companies on the Indonesia Stock Exchange (IDX) in the 2014-2019 periods. In order to test direct and indirect effects of environmental performance variable on firm value, SEM analysis was used. The result shows that environmental performance has a significant positive effect on firm value; environmental performance has no effect on financial performance; financial performance has a significant positive effect on firm value; and financial performance is not proven as a variable that mediates the effect of environmental performance on firm value. However, this finding is similar with Dahliatul et al. (2020), which state that CSR disclosure has a negative and insignificant impact on firm value through profitability.

Meanwhile, Mutmainah and Sitawati (2023) examined the mediating effect of financial performance and good corporate governance on the relationship between environmental performance and company value of manufacturing industries listed on the Indonesia Stock Exchange (IDX) for a period of five (5) years (2015-2019). Fifty-five (55) companies were sampled from the total population for a period of 5 years. Environmental performance was measured using PROPER and company value was measured using Price Book Value, for the

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mediating variable and financial performance was measured using ROA. The data analysis test tool used warp PLS 5.0 software for each variable. The test results show that environmental performance has no significant effect on company value, environmental performance has a significant and positive effect on financial performance, financial performance has a significant and positive effect on company value and environmental performance has effect on company value through financial performance of the sampled firms.

Similarly, study conducted by Apriandi et al. (2022) indicates that profitability effectively mediates the relationship between environmental costs and firm value. The study suggests that profitability is a key consideration for investors when deciding to invest. In the same vein, Alkhairani et al. (2020) documented a significant positive impact of CSR disclosure on firm value through profitability. The study suggests that environmental accounting information disclosure can improve the company's image, leading to increased consumer loyalty. This, in turn, can enhance sales and long-term profitability, which is reflected in an increase in firm value, particularly in its stock price.

Triwahyuni et al. (2022) examined the mediating effect of company's financial performance on the relationship between environmental performance and firm value of listed companies on the Indonesia Stock Exchange (IDX) for a period of eleven (11) years (2010-2020). The sample in this study is companies that follow Proper from the Ministry of Environment and Forestry of the Republic of Indonesia and have been listed on the IDX for the period under the study. In order to determine the causal relationship and to explain the direct and indirect effects of a set of variables as causal variables path analysis was used. The path analysis results showed that environmental performance significantly influences financial performance and firm value. More so, environmental performance influence firm value through financial performance.

Maryanti and Fithri (2017) state that environmental performance has an indirect effect on company value through the company's financial performance. In this case it is also supported by signal theory, in the research of Moeljadi and Supriyati (2014) where in this theory it provides an understanding of the importance of information about the company that is needed by shareholders or external parties owned by the company. In Saputra and Mahyuni's (2018) research, companies can use environmental information as a competitive advantage. Companies that have good environmental and social performance will be responded positively by investors through an increase in share prices which will increase financial performance and company value as well. It is proven in the research of Tjahjono and Eko (2013) and Fauziyyah (2019) states that environmental performance has an indirect effect on company value through financial performance.

A company's financial performance and overall market value are directly impacted by how well it manages its environmental responsibilities, such as lowering pollution, conserving resources, and following sustainability practices. This is indicated by the significant mediators that affect financial performance in the relationship between environmental and firm value. The greater the environmental performance, the greater the business value, according to the explanation and findings of earlier studies that included financial performance. So the fourth hypothesis of this study is as follows:

$H0_4$: Financial performance does not mediate the relationship between environmental performance and value of listed industrial goods companies in Nigeria.

The main contribution of this paper is to confirm the intermediary effect of financial

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performance that bridges the positive impact of environmental performance on firm value, as demonstrated below. The four hypotheses above, which were developed based on earlier findings, can now be summed up as the framework sketched for the direct and indirect paths in Figure 1.

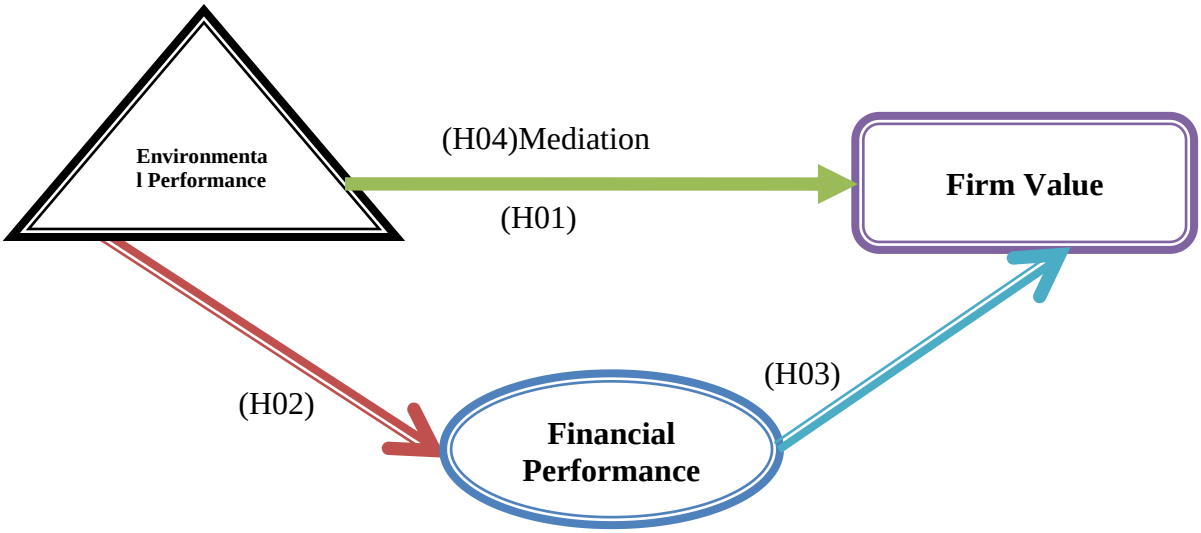

Figure 1: Hypothesized Model

Source: Developed by Researcher from the Literature Reviewed, (2024).

METHODOLOGY

3.1 Research Design

The research applied correlational research design and is carried out based on historical panel data to examine the causal relationship between environmental performance and firm value with financial performance as mediating variable of the listed industrial goods firms in Nigeria. The correlational research design was found suitable for the purpose of this study. This is used when the goal is to establish cause and effect of the relationship using the quantitative data over a period of thirteen (13) years (2010-2023). Likewise, environmental performance, financial performance and firm value have a wide range of theories under which this study is hinged.

3.2 Population for the Study

The targeted population of this study consists of all the listed thirteen (13) industrial goods firms on the Nigerian Exchange Group (NGX) and the time frame considered for this study was 2010-2023 for the purpose of secondary data collection. The industrial goods firms and their years of listing and incorporation are shown on Table 3.1 below:

Sample Size and Sampling Techniques

From Table 3.1, for any firm to be included in the sample size it must have been listed on the NGX, on or before 31ST December, 2023, Secondly, it must have been listed, without being delisted between 2010 and 2023. This criterion is established with a view to ensuring that the industrial goods firms have their published financial statements for the period covered by this study. As a result of this filter, the number of industrial goods firms reduced to eleven (11)

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firms. For this reasons Bua Cement Plc and Notore Chemical Industrial Plc were listed on NGX 2020 and 2018 respectively while Greif Nigeria Plc and Premier Paints Plc financial statements for 2021 and 2023 were not available. Hence, the remaining nine industrial goods firms were taken as the sample for the study.

Table 3.1: Population of the Study

S/No.	Name of Company	Year of Listing	Year of Incorporation
1.	Austin Laz & Company Plc.	2012	1982
2.	Berger Paints Plc.	1967	1959
3.	Beta Glass Plc.	1986	1974
4.	Bua Cement Plc.	2020	2014
5.	Cap Plc.	1978	1965
6.	Cutix Plc.	1987	1982
7.	Dangote Cement Plc.	2010	1992
8.	Greif Nigeria Plc.	1979	1940
9.	Lafarge Africa Plc.	1979	1959
10.	Meyer Plc.	1979	1960
11.	Notore Chemical Industrial Plc.	2018	2005
12.	Premier Paints Plc.	1995	1982
13.	Tripple Gee and Company Plc.	1980	1970

Source: Generated from https://ngxgroup.com/exchange/trade/equities/listed-companies/ on 20thOctober, 2024

Sources and Method of Data Collection

The study used secondary data for the analysis. Secondary data was used and extracted from the annual reports of the sampled firms in the industrial goods firms for the period of 13 years, from 2010 to 2023. It is believed that the data has been authenticated by the internal and external auditors and that it presented the true condition of the companies through which a good deduction can be made. The definitions and measurements of the variables are presented in Table 3.2 below:

Model Specification

To test the key hypotheses on the direct effect, indirect effect (mediation effect), and total effect of EP on FV through FP, the researchers followed the approach formulated by Memon et al. (2018), Mackinnon et al. (2012) and Zhao et al. (2010) and used Olanisebe et al. (2023) to test the significance level using Structural Equation Modeling (SEM) which is a statistical method used to test structured hypotheses (the dependent variable can be more than one, usually only one), the hypothesis formulated is a causal relationship of many variables (multiple variables)with the Monte Carlo approach and the following regression equations were constructed, as follows:

The first equation was developed to examine the effect of environmental performance on financial performance of listed industrial goods firm in Nigeria.

$$ROA_{it} = \beta 0 + \beta_1 EHSC_{it} + \beta_2 CDC_{it} + \beta_3 SDC_{it} + \beta_4 LEV_{it} + \beta_5 FS_{it} + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots 1$$

The second equation was developed to establish whether or not the direct relationship between the environmental performance and firm value of listed industrial firm in Nigeria is mediated by financial performance.

$$Tobin'sQ_{it} = \beta 0 + \beta_1 EHSC_{it} + \beta_2 CDC_{it} + \beta_3 SDC_{it} + \beta_4 ROA_{it} + \beta_5 LEV_{it} + \beta_6 FS_{it} + \varepsilon \quad \ldots\ldots\ldots\ldots 2$$

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Where:
ROA_{it} = Return on Assets of firm "i" in period "t"
$Tobin'sQ_{it}$= Firm value of firm "i" in period "t"
$EHSC_{it}$ = **Employee health and safety cost** of firm "i" in period "t"
CDC_{it} = Community development cost of firm "i" in period "t"
SDC_{it} = Staff development cost of firm "i" in period "t"
LEV_{it} = Financial leverage of firm "i" in period "t"
FS_{it} = Firm size of firm "i" in period "t"
β_0 = Intercept or constant
$\beta_1 - \beta_6$ = Regression coefficient of explanatory variables
i = Firm
t = Period
ε_{it} = Error term of firm "i" in period "t"

Table 3.2 Variables of the Study and their Measurements

Nature	Variables	Symbol	Measurement	Sources
Dependent Variable	Firm Value	TobinsQ	= (Market Value + Total Debt)/ Total Assets	Abdullahi and Muhammad (2023), Kurawa and Shuaibu (2022) and Chiamogu and Okoye (2020).
Independent Variable	Environmental Performance	Employee Health and Safety Cost (EHSC)	Firm's yearly total monetary employee health and safety cost divided by total assets.	Eke et al. (2024), Enekwe et al. (2023) and Okafor et al. (2021),
		Community Development Cost (CDC)	Firm's yearly total monetary community development costs divided by total assets.	Enekwe et al. (2023), Lawrence and Bernard (2023), Akinleye (2022), Frankline et al. (2022) and Akinleye and Olaoye (2021).
		Staff Development Cost (SDC)	Firm's yearly total monetary on Staff development cost divided by total assets.	Enekwe et al. (2023), Ekpoese and Enidiok (2021), Okafor (2018) and Norhasmimah et al. (2016).
Mediating Variable	ROA	ROA	PBT divided by Total Assets	Azeem et al. (2024), Ubokudom et al. (2024), Abdullahi and Muhammad (2023), Nwanwu (2022), Oraka (2021) and Obara et al. (2017).
Control Variable	Financial Leverage	FL	Total debt divided by total assets.	Abdullahi and Muhammad (2023) and Akinleye (2022).
	Firm Size	FZ	Log Natural (Total Assets)	Abdullahi and Muhammad (2023), Lawrence and Bernard (2023) and Akinleye (2022).

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ANALYSIS OF RESULTS AND DISCUSION OF FINDINGS

Data Analysis

Table 4.1: Descriptive Statistics

Variables	OBS	Mean	Std. Dev.	Min.	Max.
TOBINSQ	126	2.2418	3.6425	0.1044	16.1044
EHSC	126	0.1061	0.0812	0.0114	0.2621
CDC	126	0.0220	0.1038	0	0.727
SDC	126	0.0035	0.0073	0	0.0361
ROA	126	0.1326	0.1592	-0.14	0.7927
LEV	126	0.1424	0.1339	0	0.604
FS	126	10.0032	1.3563	0.1254	12.4872

Source: Authors' Compilation using Stata 14.2, (2024).

Table 4.1 shows that firm value (TOBINSQ) has a mean of 2.2418 with a standard deviation of 3.6425, which implies that the data for TOBINSQ of sampled firms is not widely dispersed from the mean as supported by the minimum and maximum values of 0.1044 and 16.1044 respectively. Moreover, the results show a mean value of 0.1061 in respect of data for the Employee Health and Safety Cost (EHSC) indicates that on average, firms allocate approximately 10.61% of their total assets to employee health and safety costs. This suggests a moderate investment in ensuring employee well-being. The standard deviation of 0.0812 shows variability among firms, indicating that some sampled firms spend significantly more or less on health and safety relative to their asset base. The minimum and maximum values range from 0.0114 to 0.2621, revealing that while most firms maintain lower expenditures, some invest heavily in employee health and safety in the period under review.

Moreover, Table 4.1 presents an average Community Development Cost (CDC) of 0.0220 indicates that, on average, firms spend about 2.20% of their total assets on community development initiatives. This suggests that community engagement may not be a primary focus for many firms and standard deviation of 0.1038, which reflects variability, suggesting some firms are more active in community development than others. The data for CDC is not widely spread from its mean as indicated by the minimum and maximum values of 0 and 0.727 respectively. This shows that while some firms do not allocate any resources to community development, others invest a significant portion of their assets. Similarly, Staff Development Cost (SDC) reports a mean of 0.0035 indicates that, on average, firms allocate only about 0.35% of their total assets to staff development costs. This suggests a relatively low investment in the professional growth and training of employees across the sampled firms. More so, standard deviation of 0.0073 shows that there is very little variability among firms regarding their spending on staff development, indicating that most firms spend similarly low amounts relative to their asset base given the minimum and maximum values of 0 and 0.0361 which indicates that while some firms do not allocate any resources to staff development, others do invest more significantly, with a maximum of 3.61% of their total assets.

From Table 4.1 above, the average return on assets (ROA) of the pooled industrial goods firms from 2013-2023 was 0.1326, which suggests firms generate an average return of 13.26% on their assets, reflecting overall profitability. The minimum and maximum values range from -0.14 to 0.7927 shows that while some firms are unprofitable, others are quite profitable.

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However, the standard deviation of 0.1592 (16%) shows that profitability (return on assets) in the sector was not on the high side.

Furthermore, financial leverage measured as proportion of debt-bearing interest to total assets of the sampled firms in Nigeria has a mean of 0.1424, indicates that, on average, 14.24% of firms' assets are financed by debt-bearing interest. The value of standard deviation is 0.1339 indicates a variability in leverage, suggesting some firms are more reliant on debt than others. It is also noteworthy that, minimum and maximum values range from 0 to 0.604 shows that while some firms are entirely equity-financed, others have significant debt-bearing interest. Similarly, firm size measured by the natural logarithm of total assets of the sampled firms has a mean value of 10.0032 and standard deviation of 1.3563. This shows the dispersion of the data for firm size is widely dispersed from it mean, as indicated by the minimum and maximum values of 0.1254 and 12.4872 respectively, this indicates the presence of both small and large firms in the sample.

Table 4.2: Correlation Matrix

Var.	TOBINSQ	EHSC	CDC	SDC	ROA	LEV	FS	VIF
TOBINSQ	1.000							
EHSC	-0.0363	1.000						1.68
CDC	0.3542	-0.2724	1.000					1.07
SDC	-0.1332	0.2781	-0.0533	1.000				1.34
ROA	0.0506	0.4147	-0.1155	0.0190	1.000			1.39
LEV	-0.2694	-0.1739	-0.0639	0.3559	-0.2657	1.000		1.35
FS	-0.1883	-0.3510	-0.1030	-0.1601	0.0945	0.1025	1.000	1.30

Source: Authors' Compilation using Stata 14.2, (2024).

Table 4.2 represents the correlation matrix test, shows the extent to which the pair variable is associated with each other in the regression model. From the Table 4.2, EHSC, SDC, LEV and FS showed a negative association with firm value while CDC and ROA individually showed a positive relationship with value of the sampled industrial goods firms in Nigeria. In summary, it can be seen that the correlation among the current study's variables is generally low; hence, this is an indication that there are no problems arising from the multi-collinearity between the variables used in the regression models. In addition, the result of the variation inflation factor (VIF) test for multi-collinearity problems shows that the VIF values among all the variables are less than 10%, and this indicates the absent of a multi-collinearity problems in the regression models.

Regression Results

This sub-section presents the regression result of the impact of environmental performance on value of listed industrial firms in Nigeria mediating effect of financial performance using Structural Equation Modeling (SEM) using STATA. Table 4.3 showed the estimation result of impact of environmental performance on financial performance which is direct effects.

Table 4.3 presents the regression estimates of the direct effect of impact of environmental performance on financial performance. The test reveals a cumulative R^2 of 0.2815 (28%), this means that variables that were included in the model explain about 28% of the variation in financial performance measured by ROA, and other variables not include in model carry about 72% of the variation in dependent variable. The likelihood ratio (F-statistics), which statistically is significant ($p<0.001$), indicates that the model is fit to describe the change in the explanatory

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variables (EHSC, CDC, SDC, LEV and FS) and mediating variable financial performance (ROA).

Table 4.3: Model I – Direct Effects (Environmental Performance and Financial Performance)

Path	Coefficient	Z-value	P-value
EHSC—> ROA	0.9211	5.30	0.000
CDC—> ROA	-0.0291	-0.24	0.809
SDC—> ROA	0.2151	0.11	0.910
LEV—> ROA	-0.2588	-2.55	0.011
FS—> ROA	0.0330	3.42	0.001
CONS	-0.2585	-2.44	0.015
R-square	0.2815		
P-value	0.000		
Likelihood	327.10197		
Obs	126		

Source: Authors' Compilation using Stata 14.2, (2024).

Table 4.4: Model 2 – Total Effects (Environmental Performance and Firm Value)

Path	Coefficient	Z-value	P-value
ROA—>TOBINSQ	2.2298	1.05	0.295
EHSC—>TOBINSQ	-5.1476	-1.12	0.262
CDC—>TOBINSQ	10.8872	3.80	0.000
SDC—>TOBINSQ	-21.50931	-0.47	0.638
LEV—>TOBINSQ	-5.6797	-2.28	0.023
FS—>TOBINSQ	-0.5138	-2.13	0.033
_CONS	8.2761	3.19	0.001
R-square	0.2170		
P-value	0.000		
Likelihood	327.10197		
Obs	126		

Source: Authors' Compilation using Stata 14.2, (2024).

The SEM regression shows that environmental performance proxy by EHSC has positive and significant impact on financial performance of listed industrial goods firms in Nigeria while CDC and SDC have insignificant impact on financial performance. This implies that Employee Health and Safety Cost (EHSC) influence financial performance of listed industrial goods firms in Nigeria which indicates a direct effect, according to the null hypothesis ($H0_2$) of hypothesis two, which the researcher rejected in favour of Employee Health and Safety Cost but fail to reject in favour of Community Development Cost (CDC) and Staff Development Cost (SDC). Therefore, Employee Health and Safety Cost (EHSC) of listed industrial goods firms in Nigeria is primarily influenced their financial performance (return on assets-ROA). The study findingis consistent with those of Azeem et al. (2024), Major and Nwdighoha (2024), Abdullahi and Muhammad (2023), Ibeanu et al. (2023), Lawrence and Bernard (2023), Ekpoese and Enidiok (2021) and Ifurueze et al. (2013) while contrasted with the findings of Enekwe et al. (2023) and Nwaimo (2020). More so, insignificant of environmental performance (community development cost and staff development cost) on financial performance is in line with result of Ubokudom et al. (2024), Enekwe et al. (2023), Septiavin et al. (2023), Ekpoese and Enidiok (2021) and Norhasmimah et al. (2016) but against the finding of Okafor (2018) who concluded

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that staff development costs influenced return on assets as a measurement of financial performance.

Furthermore, financial leverage and firm size influence financial performance of listed industrial goods firms in Nigeria. Table 4.4 showed the estimation result of total effects of impact of environmental performance on firm value.

Table 4.4 shows the result of the two models, the SEM model is fit, as it explain a significant proportion of the environmental performance on firm value with an R^2 of 0.2170 (22) with a positive and significant value for the F-statistic. From the Table, the result shows that financial performance has insignificant and positive impact on firm value which is in line with finding of Darmayoga et al. (2020) and Suminar (2018) who concluded that financial performance has insignificant impact on firm value. Moreover, EHSC and SDC have insignificant impact on firm value but CDC has significant impact on value of listed industrial goods firm in Nigeria. Also, insignificant impact EHSC and SDC on firm value is in line with findings of Sudimas et al. (2023), Aini and Faisal (2021) and Budiharjo (2019) but is inconsistency with findings of Fauzi (2022), Mardiana and Wuryani (2019) and Saputra and Mahyuni (2018) who concluded that environmental performance has a significant effect on firm value. In addition, the control variables, such as financial leverage and firm size have significant impact on firm value of listed industrial goods firms in Nigeria.

Environmental Performance and Firm Value: The Mediating Effect of Financial Performance

Model three tests the impact of environmental performance on firm value of listed industrial goods firms in Nigeria with indirect effects of financial performance on the connection. In this analysis, Monte Carlo approach was adopted to assess the indirect effects significant level as shown in Table 4.5:

Table 4.5: Result of Indirect Effect

Path	IE Coef	z-value	P-value	Decision	Mediation
EHSC—>ROA—>TOBINSQ	0.047	0.969	0.332	Direct-only Non-mediation	No Mediation
CDC—>ROA—>TOBINSQ	-0.002	-0.698	0.485	No Effect Non-mediation	No Mediation
SDC—>ROA—>TOBINSQ	-0.015	-0.757	0.449	No Effect Non-mediation	No Mediation

Source: Authors' Compilation using Stata 14.2, (2024).

Table 4.5 presents the mediation procedure describe by Zhao et al. (2010) to test the significant of the indirect effects. The study employed the Monte Carlo z-test using MEDSEM as recommended by Tofighi and Mackinnon (2016). The result also shows that relationship between environmental performance and firm value of listed industrial goods firms in Nigeria does not mediate by financial performance as shown in Table 4.5.The finding that the relationship between environmental performance and firm value of listed industrial goods firms in Nigeria is not mediated by financial performance suggests that improvements in environmental practices directly enhance firm value without relying on financial performance as an intermediary. This indicates that investors and stakeholders may value environmental performance on its own merits, independent of the company's financial performance metrics. A lack of mediation could indicate that stakeholders directly reward firms for their environmental performance, irrespective of their financial outcome. This finding is in line with results

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documented by Asriani et al. (2024), Patima et al. (2024), Hayatul et al. (2023), Sudimas et al. (2023), Fauzi (2022), Aini and Faisal (2021) and Dahliatul et al. (2020), who concluded that if the environmental performance is good without financial performance, the company value will remain good.

This result is contradicted with finding of Mutmainah and Sitawati (2023), Apriandi et al. (2022), Triwahyuni et al. (2022), Fauziyyah (2019), Handayani (2019), Maryanti and Fithri (2017), and Chang (2015) who found that firms can leverage environmental performance as a competitive advantage. Strong environmental and social performance often leads to positive investor perceptions, which can result in increased stock prices and overall company value. This enhanced reputation can attract more investments and improve financial performance, as stakeholders increasingly prioritize sustainability in their decision-making processes. More so, research supports this notion, indicating that companies with robust environmental, social, and governance (ESG) practices tend to experience better financial outcomes and market performance (Sarkar et al., 2023) and that effective green supply chain management can enhance corporate environmental performance and competitive advantage (Wiredu et al., 2023). Additionally, improved environmental performance can foster greater organizational citizenship behavior, further contributing to overall sustainability and success (Sujata & Madhusmita, 2023).

Testing of Hypotheses

The above results were used to test the four null hypotheses developed in the literature review as follows:

HO_1: Environmental performance has insignificant impact on value of listed industrial goods companies in Nigeria. The study rejected the hypothesis one in favour of Staff Development Cost (SDC) and fails to reject in favour of **Employee Health and Safety Cost (EHSC)** and Community Development Cost (CDC).

HO_2: Environmental performance has insignificant impact on financial performance of listed industrial goods companies in Nigeria. The study rejected the hypothesis two in favour of **Employee Health and Safety Cost (EHSC)** and fails to reject in favour of Community Development Cost (CDC) and Staff Development Cost (SDC).

HO_3: The study fails to reject the hypothesis three; thus, **financial performance does not influenced value of listed industrial goods companies in Nigeria.**

HO_4: The study fails to reject hypothesis four; therefore, f**inancial performance does not mediate the relationship between environmental performance and value of listed industrial goods companies in Nigeria.**

CONCLUSION AND RECOMMENDATION

This study examined the mediating effect of financial performance on the relationship between environmental performance and value of listed industrial goods companies in Nigeria. Using secondary data taken from the listed industrial goods firms listed on Nigerian Exchange Group (NGX) over a period of fourteen years (2010-2023). Overall, this study provides underline the importance of embedding environmental sustainability into corporate strategy. Firms that actively engage in environmental performance may enhance their market valuation through

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improved stakeholder trust, compliance with environmental regulations, and a stronger corporate reputation. The results reveal that the financial performance variable is not proven mediating the effect of environmental performance on firm value. This study concludes that the lack of mediation by financial performance suggests that the market may be evolving to reward companies for proactive environmental management, potentially leading to increased stock prices and firm value.

Based on the specific findings of this study, the researchers recommended that management of listed industrial goods companies in Nigeria should prioritize and invest in environmental initiatives, recognizing that strong environmental performance can directly enhance firm value. This could include adopting sustainable practices, improving waste management, and reducing carbon emissions. By doing so, firms can distinguish themselves in the market and attract environmentally conscious investors

More so, the management needs to develop a comprehensive sustainability strategy that integrates environmental performance into their core business practices. This strategy should outline specific goals, performance metrics, and timelines for achieving improvements in environmental practices. Such a proactive approach can lead to better long-term positioning in the market. Management should establish and regularly review a comprehensive system for managing employee health and safety costs, community development costs, and staff development costs. This system is essential to create a harmonious corporate environment that fosters collaboration and trust between managers and employees, ultimately leading to maximum productivity. Finally, management should invest in staff training and development focused on sustainability can equip employees with the skills necessary to implement and manage environmental initiatives effectively. This could enhance internal capabilities and foster a culture of sustainability within the organization.

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