

Determinants of Firm Value: The Role Of Environmental Management Performance Of Listed Industrial Goods Firms On Nigeria Exchange Group

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Abstract: *The study investigated the effect of environmental management performance in determining the firm value of listed industrial goods firms on Nigeria Exchange Group. Specifically, the study examined the effect of environmental prevention, protection and waste management costs respectively on price-earnings ratio (P/E), earnings per share (EPS) and net assets per share (NAPS) of listed industrial goods firms on Nigeria Exchange Group. The theoretical framework of the study was based on stakeholders' theory. The research design employed in this study is ex-post facto. The population of the study comprised thirteen (13) listed industrial goods firms on the Nigeria Exchange Group as at 31st December 2024 while the sample size which was derived by purposive sampling technique was made up of ten (10) of these firms with complete annual report and accounts from 2014-2023 which was the period covered by this study. Secondary data collection based on the firms' annual report and accounts was utilized for the study. The three hypotheses of the study which were tested with the aid of robust least square regression technique at 5% level of significance revealed that: environmental prevention, protection and waste management costs respectively have significant positive effect on price-earnings ratio (P/E), earnings per share (EPS) and net assets per share (NAPS) of listed industrial goods firms on Nigeria Exchange Group. Based on the findings, it was recommended amongst others that firms strategically invest in environmentally sustainable practices and technologies that align with corporate sustainability as such firms may be considered less risky, leading to a higher valuation in terms of their value and financial metrics.*

Keywords: Environment; Environmental Management; Performance; Firm; Value

1. Introduction

Firm Value is seen as an important indicator for increasing the competitiveness of a firm amidst very tight business competition (Imam, Hamdani, Dirvi, Nguyen & Petty, 2024). Ultimately, firms require large costs for their operations, so they prefer operational activities that do not affect Firm Value (Husnaini and Tjahjadi, 2021). The importance of environmental management and how to manage its attendant costs has become of utmost concern globally especially as it relates to industrial goods firms in contemporary times. It has become one of the foremost issues on the agenda of nations and businesses in the 1990s and the reasons for this were varied and emanated from both within and outside of the firm and particularly at the global level (Okoye & Ngwakwe, 2013). To champion this further, a lot of Government enactments, laws and regulations on environmental protection have been made in several nations of the world, including Nigeria, to see how these issues can be tackled (Arong et al., 2014).

Corporate environmental Management refers to the process of managing a firm's impact on the environment. It involves the planning, implementation and monitoring of strategies and practices aimed at reducing environmental degradation and promoting sustainability. Sustainability in business requires firms not to measure only profit, but should also consider planet and people by producing accurate information on both environmental costs and firm value. While according to Deegan (2002), environmental costs account for one of the many different types of costs firms incur as they provide goods and services to their customers, other researchers finds that the adoption of various environmental management strategies can improve operating modes, reduce production costs, and improve company reputation, thereby bringing significant improvements in social and financial performance (Banerjee, 2001).

Environmental management performance which refers to the measurement and evaluation of firms' environmental management efforts and their impact on the environment is one of the keys for firms to achieve their sustainability goals, especially for firms that are at a high level of competition. Every firm has the objective of maintaining the continuity of its business so that its existence is maintained. Thus, in maintaining the continuity of its business, an entity must have clear and directed goals. According to Anjasari & Andriati (2016), entities have numerous goals that play an important role in achieving maximum profit for the welfare of stakeholders. In addition, business entities are also internally obliged to maximize the value of the firm reflected in their share prices, price to earnings ratio, net asset per share amongst others. Firms in achieving these goals face many challenges. They not only face challenges in maximizing their financial performance and generating economic benefits, they also face environmental problems as their operations impact on the environment as it contributes to the firms in achieving their goals. Commitment to the environment is the main and inseparable part of the firms' operational activities (Ningsih & Rachmawati, 2017). Good environmental management performance is reflected by low level of environmental damage and high environmental damage indicates the failure of a firm's

environmental control and management system (Sulistiawati & Dirgantari, 2017; Indriastuti & Chariri, 2021). Also, a firm's ability to manage the environment is also shown through optimal environmental management performance. A firm's optimal environmental management performance reflects a low level of pollution and improved firm's image in the eyes of stakeholders (Utomo, Rahayu, Kaujan & Irwandi, 2020).

Environmental management creates corporate consequences in the form of environmental costs. Environmental management cost includes expenditures for pollution control, waste management, energy efficiency measures, as well as costs related to environmental compliance and reporting (Eggen, Hollender, Joss, Schärer & Stamm, 2014). According to Eggen, Hollender, Joss, Schärer & Stamm, (2014), environmental management costs can have a significant impact on a firm's financial performance and can affect its market value in both positive and negative ways. Thus, many studies in this given nexus argue that costs incurred for environmental management activities become a burden to firms as they reduce firms' profits (Hapsari et al, 2021). However, many other studies argue on the need for firms to allocate environmental management costs well as it controls environmental damage and increases firms' productivity and value in the long run (Rakos & Antohe, 2014; Hapsari et al, 2021). Although there is no guarantee of certainty regarding the result of the effect of environmental management cost on firm value, Agustia et al., (2019), argues that the many benefits derivable from the implementation of environmental management is far more valuable than the costs incurred.

While the benefits derivable from the implementation of environmental management cannot be overemphasized, the exploration of its effect on firm value cannot also be overemphasized as most firms continuously perceive it as a burden to their profit thus devising ways of evading these costs to maximize their value and financial performance. In Nigerian context, it is important to explore the effect of these costs on firm value for the industrial goods firms which constitute a major sector of the Nigerian economy as this would enable managers of these firms to make informed decisions concerning their corporate strategy and sustainability.

2. Review of Related Literature

2.1 Firm Value

Firm value is the market value or price applicable to the company's general shares. is defined as market value (Martins & Lopes, 2016). Firm value describes how well or poorly management manages its resources. This can be seen from the measurement of financial performance. It is an investor's perception of the level of success of the firm that is often associated with share prices. Investors believe that the value of a firm is an important concept that the market uses as an indicator to judge the firm as a whole. Hence, high firm value is an achievement for a firm because it can bring prosperity and profitability for shareholders and make the market believe not only in the firm's performance but also in future prospects. The wealth of shareholders and firms is presented by the stock market price, which is a reflection of funding investment decisions and asset management.

For the purpose of this study, the following market values were adopted as proxies for firm value:

2.1.1 Price-To-Earnings (P/E) Ratio (PER)

Price-to-earnings (P/E) ratio is important when valuing a business. It is a good metric for investors that want an instant fix price on what the market thinks of a firm. Ben (2018) highlighted the strength in using price earnings Ratio (PER) as follows:

1. P/E ratio compares company's stock price with its historical earnings per share (EPS). It is effectively shorthand for how expensive or cheap a share is compared with its profits.
2. Price earnings ratio tells us what an investor is prepared to pay for every one Naira of those earnings and how many years an investor would have to wait to recoup his investment through current earnings assuming all earnings are paid out as dividends.

However, Warren (2018) gave the shortcomings of the price-to-earnings ratio. He opined that unlike other metrics such as cash flow and dividends, earnings can be subject to manipulation at company level, which implies that PER can be distorted depending on how the firm had accounted for a particular item.

In spite of the PER shortcomings, it is believed that if investors take account of known risks, the ratio offers an important valuation.

The formula is given below:

$$\text{P/E ratio} = \frac{\text{market value of shares}}{\text{Earnings per share}}$$

2.1.2 Earnings per Share (EPS)

This is calculated as the total earnings of a firm divided by the total number of shares outstanding. This measurement does not reflect market price of a firm's share but can be used by investors to derive the price they think the shares are worth.

Sharma & Verma (2021) opined that EPS is a ratio used to determine how much net income per share of a firm. EPS is used because it has both accounting measures and market value measure. (a hybrid of both accounting and financial market based measures). It is good because it avoids the biases that may occur from depending on only one type of measure.

The formula is given below:

$$\text{EPS} = \frac{\text{Profit after tax less pref. dividend}}{\text{No. of ordinary shares capital in issue}} \times 100$$

2.1.3 Net asset value per share (NAPS)

The net asset value per share also known as the net asset per share is an accounting value of share in a business. It is likely to be different to the least traded share price. The traded share price is usually lower than the net assets per share unless the business is paying high dividend or growing rapidly. The net asset per share is like the stock price as it represents the value of one share to net assets. Besides, both measures provide the investors with a way of comparing fund performance with the market or industry benchmarks. Under the asset approach of business valuation one adopts the order of a business as a set of assets and liabilities. The general formula used for computation of Net asset per share is:

$$\text{NAPS} = \frac{\text{Net assets}}{\text{Number of shares outstanding}}$$

2.2 Environmental Management Performance

Environmental management performance refers to the measurement and evaluation of firms' environmental management efforts and their impact on the environment. It is also seen as the management effort to create a balanced environment and build a good image in the eyes of stakeholders (Harahap et al., 2018). It is the firm's achievement in managing its business by taking into account environmental impacts (Gabrielle & Toly, 2019). Mariani & Suryani (2018) provides that firms that survive are the ones that pay attention to environmental performance. Thus, firms that pay attention to environmental management performance reduce negative environmental impacts from their activities.

Environmental management performance creates corporate consequences in the form of environmental costs. These costs include expenditures for pollution control, waste management, energy efficiency measures, as well as costs related to environmental compliance and reporting amongst others. For the purpose of this study, environmental prevention, protection and waste management costs would be studied to determine their effect on firm value.

2.3 Theoretical and Research Framework

This study is anchored on the stakeholder theory. This theory propounded by R. Edward Freeman in 1984, is a powerful theoretical framework that underscores the significance of considering the interests and concerns of all stakeholders in business decision-making. It encourages a holistic approach to corporate governance, ethics, and CSR, emphasizing that a firm's success and sustainability are inherently linked to its relationships with diverse stakeholders (Dmytriiev, Freeman & Hörisch, 2021). Stakeholder theory reflects the evolving expectations of the business community and society at large, as it recognizes that businesses have a broader role to play in promoting ethical and sustainable practices. This theory was adopted for the study because of stakeholders concern for environmental sustainability and the need to determine firms' priorities, strategies, and commitment to environmental responsibility.

Based on the theoretical background the research framework for this study is conceptualized and presented in Figure 1.

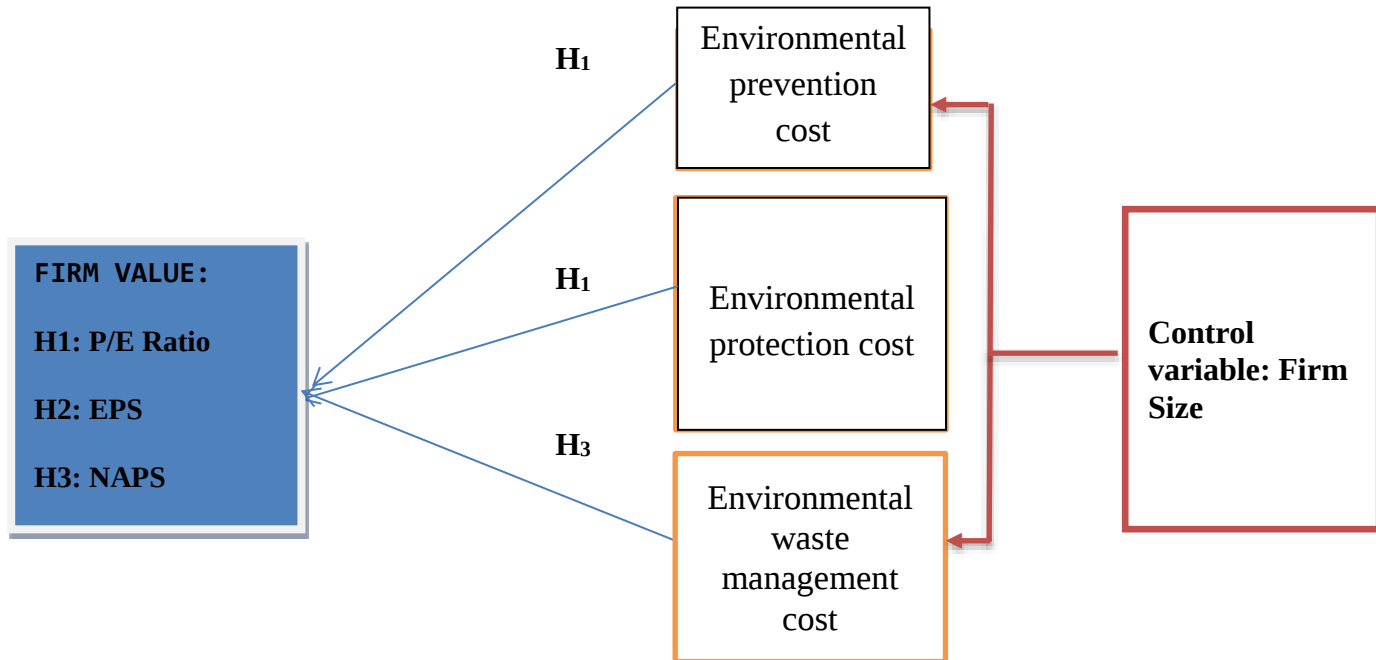


Figure 1: Research Framework
Source: Authors' Conceptualization

3. Methodology

3.1 Research Design

The study adopted an *ex-post facto* design. This research design was chosen as it allows for the analysis of existing secondary data, collected from the annual reports of these firms over a specified period. It is used to examine the effect of one variable on other using events that have occurred in the past. The use of this design is appropriate for the study since it aims to examine the extent to which environmental management costs influenced firm value using already existing data from 2014 to 2023.

3.2 Population of Study

The population of the study comprised the entirety of industrial goods manufacturing firms that hold listings in Nigeria Exchange Group. As at 31st December 2024, this sector of the Nigerian Exchange Group has a total of 13 firms.

3.3 Sample Size and Sampling Technique

Purposive sampling technique was employed to select the sample constituents based on the availability of annual reports for the period covered by the study. The final sample comprised ten (10) industrial firms that had complete financial statements from 2014 to 2023.

3.4 Methods of Data Collection

The method adopted for data collection is secondary data. The data were sourced from the annual reports of the sampled firms from 2014 to 2023. Therefore, ten year data were utilized in the study in order to determine how environmental management costs influence firm value of industrial goods firms in Nigeria. The proxies for environmental management cost for which data were collected include: environmental prevention costs, environmental protection cost and environmental waste management costs. On the other hand, data on price-to-earnings(P/E) ratio, Earnings Per Share and net asset per share were collected in order to measure the firm value.

3.5 Description of Variables

Table 1: Measurement of Variables

Variables	Measurement	Source
1) Environmental Prevention Cost	Natural log of expenditure incurred in preventing hazard that could cause damage to the environment	Onyeneho & Inyama, 2023
2) Environmental Protection Cost	Natural log of expenditure incurred in promoting sustainability, and complying with regulations aimed at preserving the natural environment	Falope, Offor & Ofurum, 2019; Uzoh, 2022
3) Environmental Waste Management Cost	Natural log of expenditure incurred in waste management	Okudo & Amahalu, 2023
4) Price-to-Earnings Ratio	Share price/earnings per share	Sha, 2017
5) Earnings Per Share	Earnings after tax/total number of ordinary shares	Sha, 2017
6) Net Asset Per Share	Net Asset/total number of ordinary shares	Miah & Islam, 2012
7) Firm Size	Natural log of total asset	Onyali & Okafor, 2018

Source: Researchers' Compilation

3.6 Model Specification

In carrying out the linear regression analysis, the study developed and applied the three models below as controlled by firm size:

$$PER_{it} = \beta_0 + \beta_1 EPRE_{it} + \beta_2 FSZ_{it} + \varepsilon_{it} \text{-----for hypothesis I}$$

$$EPS_{it} = \beta_0 + \beta_1 EPRO_{it} + \beta_2 FSZ_{it} + \varepsilon_{it} \text{-----for hypothesis II}$$

$$NAPS_{it} = \beta_0 + \beta_1 EWMC_{it} + \beta_2 FSZ_{it} + \varepsilon_{it} \text{-----for hypothesis III}$$

Where:

PER_{it} = Price earnings ratio for firm i in year t

EPS_{it} = Earnings per share for firm i in year t

$NAPS_{it}$ = Net asset per share for firm i in year t

$EPRE_{it}$ = Environmental prevention cost for firm i in year t

$EPRO_{it}$ = Environmental protection cost for firm i in year t

$EWMC_{it}$ = Environmental waste management cost for firm i in year t

FSZ_{it} = Firm size for firm i in year t

β_0 is the intercept or constant value

β_1, β_2 are the coefficients or parameters

ε_{it} is the error term for firm i in year t

3.7 Method of Data Analysis

There were two methods of data analyses adopted in the study: the first was descriptive analysis while the second was inferential analysis. In one hand, descriptive tools such as mean, maximum, standard deviation, and minimum value were used in summarizing the data. On the other hand, robust least square regression was used in testing the hypotheses of the study at 5% significance level.

4. Data Analysis and Results

4.1 Data Analysis

Descriptive analysis was employed to succinctly summarize the data, facilitating a comprehensive grasp of the variables. See table 2 below for this descriptive analysis.

Table 2: Descriptive Analysis

	PER	NAPS	EPS	EPRE	EPRO	EWMC	FSZ
<i>Mean</i>	78.99360	18.00648	3.252020	5.545900	4.267800	0.345500	6.983115
<i>Median</i>	7.809459	3.771717	0.719118	5.595000	4.575000	0.000000	6.560392
<i>Maximum</i>	7164.785	87.52879	28.25362	7.710000	6.260000	5.370000	9.424631
<i>Minimum</i>	-139.0578	-5.004620	-7.322514	0.000000	0.000000	0.000000	5.239405
<i>Std. Dev.</i>	716.6388	25.26016	6.081402	1.397306	1.669347	1.164369	1.099994
<i>Skewness</i>	9.811984	1.463762	2.081575	-1.629024	-1.453924	3.376250	0.923729
<i>Kurtosis</i>	97.51764	3.809704	7.463653	8.298845	4.663170	13.32650	2.627205
<i>Jarque-Bera</i>	38827.85	38.44173	155.2334	161.2193	46.75713	634.3039	14.80033
<i>Probability</i>	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000611
<i>Sum</i>	7899.360	1800.648	325.2020	554.5900	426.7800	34.55000	698.3115
<i>Sum Sq. Dev.</i>	50843548	63169.48	3661.362	193.2940	275.8853	134.2199	119.7886
<i>Observations</i>	100	100	100	100	100	100	100

Source: Analysis Output using Eviews 12

From table 2 above, the mean value of Price-to-Earnings ratio (PER) is 78.99360. However, the wide spread is evident with a maximum of 7164.785 and a minimum of -139.0578, suggesting potential outliers or extreme values in the data. The standard deviation is high at 716.6388, reflecting substantial variability. The positively skewed distribution (skewness of 9.811984) and high kurtosis (97.51764) imply a non-normal distribution with a heavy right tail, possibly due to extreme positive values.

The mean Net Asset Per Share (NAPS) is 18.00648, representing the average net asset value. The maximum and minimum values are 87.52879 and -5.004620, respectively. The standard deviation is 25.26016, indicating moderate variability. The positive skewness (1.463762) and positive kurtosis (3.809704) suggest a distribution with a right-leaning tail but less extreme compared to PER.

Earnings Per Share (EPS) has a mean value of 3.252020, with a maximum of 28.25362 and a minimum of -7.322514. The standard deviation is 6.081402, reflecting moderate variability. The positively skewed distribution (skewness of 2.081575) and high kurtosis (7.463653) suggest a non-normal distribution with a right-skewed tail.

Environmental Protection Costs (EPRE) has a mean value of 5.545900, indicating an average spending on environmental protection. The maximum is 7.710000, and the minimum is 0.000000. The standard deviation is 1.397306, suggesting relatively low variability. The negatively skewed distribution (skewness of -1.629024) and high kurtosis (8.298845) imply a non-normal distribution with a heavy left tail, possibly due to extreme low values.

Environmental Prevention Costs (EPRO) has a mean value of 4.267800, representing the average expenditure on environmental prevention by listed industrial goods firms on the Nigeria Exchange Group. The range between the maximum (6.260000) and minimum (0.000000) values indicates variability in spending. The standard deviation is 1.669347, suggesting moderate variability. The negatively skewed distribution (skewness of -1.453924) and positive kurtosis (4.663170) suggest a non-normal distribution with a heavier left tail, possibly indicating a concentration of lower values compared to the mean.

Environmental Waste Management Costs (EWMC) has a mean of 0.345500, indicating an average spending on environmental waste management. The range between the maximum (5.370000) and minimum (0.000000) values highlights variability in spending patterns. The standard deviation is 1.164369, reflecting moderate variability. The positively skewed distribution (skewness of 3.376250) and high kurtosis (13.32650) suggest a non-normal distribution with a right-skewed tail, indicating potential outliers or extreme values.

Firm Size (FSZ) has a mean of 6.983115, representing the average size of listed industrial goods firms on the Nigeria Exchange Group. The range between the maximum (9.424631) and minimum (5.239405) values indicates variability in firm size. The standard deviation is 1.099994, suggesting relatively low variability. The positively skewed distribution (skewness of 0.923729) and moderate kurtosis (2.627205) suggest a distribution with a right-skewed tail but less extreme compared to EWMC, indicating a relatively balanced distribution of firm sizes. The Jarque-Bera test, with a probability of 0.00 for all variables, supports the rejection of the null hypothesis of normal distribution, reinforcing the non-normality observed in the skewness and kurtosis values. For this reason, Robust Least Square regression analysis was deployed for the purpose of hypotheses testing.

4.2 Test of Hypotheses and Results

4.2.1 Test of Hypothesis I

H01: Environmental prevention cost does not have significant effect on price earning (P/E) ratio of listed industrial goods firms on Nigeria Exchange Group.

Table 3: Regression for Test of Hypothesis I

Dependent Variable: PER

Method: Robust Least Squares

Date: 04/04/25 Time: 04:31

Sample: 1 100

Included observations: 100

Variable	Coefficient	Std. Error	z-Statistic	Prob.
EPRE	10.84057	0.834089	12.99689	0.0000
FSZ	-6.806924	1.059532	-6.424465	0.0000
C	-7.673334	4.999343	-1.534869	0.1248
Robust Statistics				
R-squared	0.188766	Adjusted R-squared		0.172040
Scale	6.166120	Deviance		38.02103
Rn-squared statistic	195.8095	Prob(Rn-squared stat.)		0.000000

Source: Analysis Output using Eviews 12

The results of the regression analysis in table 3 for Hypothesis H01, which tests the significance of the effect of environmental prevention cost (EPRE) on the price-earning (P/E) ratio of listed industrial goods firms on the Nigeria Exchange Group, indicate significant findings. The adjusted R-squared value of 0.172040 indicates that the model explains approximately 17.2% of the variability in the P/E ratio. Furthermore, the Rn-squared of 195.8095 with a corresponding p-value of 0.000000 supports the overall significance of the regression model. The negative coefficient of the control variable, being Firm Size (FSZ) with a value of -6.806924 and a p-value of 0.0000, suggests a significant negative relationship between firm size and the P/E ratio.

The coefficient for environmental prevention costs (EPRE) is 10.84057. This suggests that environmental prevention cost has a statistically significant positive effect on the P/E ratio, implying that every increase in EPRE by a margin will increase PER by 10.84057. The associated p-value is 0.0000, which is less than significance level of 0.05. Therefore, the alternate hypothesis (is accepted that environmental prevention cost has a significant positive effect on the price/earnings ratio of listed industrial goods firms on the Nigeria Exchange Group (p -value = 0.0000).

4.2.2 Test of Hypothesis II

H02: Environmental protection cost does not have significant effect on Earnings Per Share of listed industrial goods firms on Nigeria Exchange Group.

Table 4: Regression for Test of Hypothesis II

Dependent Variable: EPS

Method: Robust Least Squares

Date: 04/04/25 Time: 04:40

Sample: 1 100

Included observations: 100

Variable	Coefficient	Std. Error	z-Statistic	Prob.
EPRO	0.188657	0.082157	2.296304	0.0217
FSZ	1.056505	0.124681	8.473666	0.0000
C	-6.821288	0.704825	-9.677994	0.0000

Robust Statistics			
R-squared	0.120556	Adjusted R-squared	0.102424
Rw-squared	0.550252	Adjust Rw-squared	0.550252
Akaike info criterion	218.6790	Schwarz criterion	229.3341
Deviance	258.5075	Scale	1.095202
Rn-squared statistic	175.8870	Prob(Rn-squared stat.)	0.000000

Source: Analysis Output using Eviews 12

The results of the regression analysis for Hypothesis H02 in table 4 above which examines the significance of the effect of environmental protection cost (EPRO) on the Earnings Per Share (EPS) of listed industrial goods firms on the Nigeria Exchange Group are as follows: The adjusted R-squared value of 0.102424 implies that the model explains approximately 10.2% of the variability in EPS. Furthermore, the Rn-squared statistic of 175.8870 with a corresponding p-value of 0.000000 indicates the overall significance of the regression model. As per the control variable, the coefficient for Firm Size (FSZ) is 1.056505, and the p-value is 0.0000, suggesting a statistically significant positive relationship between firm size and EPS.

The coefficient for environmental protection cost (EPRO) is 0.188657, implying that an increase in EPRO by a margin will increase EPS by 0.188657. The associated p-value is 0.0217, which is less than the significance level of 0.05. This indicates that environmental protection cost has a statistically significant positive effect on EPS. Thus, the alternate hypothesis was accepted that environmental protection cost has a significant positive effect on the Earnings Per Share of listed industrial goods firms on the Nigeria Exchange Group (p-value = 0.0217).

4.2.3 Test of Hypothesis III

H03: Environmental waste management cost does not have significant effect on Net Asset Per Share of listed industrial goods firms on Nigeria Stock Exchange Group.

Table 5: Regression for Test of Hypothesis III

Dependent Variable: NAPS

Method: Robust Least Squares

Date: 04/04/25 Time: 04:55

Sample: 1 100

Included observations: 100

Variable	Coefficient	Std. Error	z-Statistic	Prob.
EWMC	9.020704	0.602031	14.98380	0.0000
FSZ	13.64753	0.637264	21.41582	0.0000
C	-84.16551	4.507826	-18.67098	0.0000
Robust Statistics				
R-squared	0.246720	Adjusted R-squared	0.231189	
Rw-squared	0.900206	Adjust Rw-squared	0.900206	
Akaike info criterion	187.8497	Schwarz criterion	196.3073	
Deviance	5466.390	Scale	5.473041	
Rn-squared statistic	687.5127	Prob(Rn-squared stat.)	0.000000	

Source: Analysis Output using Eviews 12

The results of the regression analysis for Hypothesis H03, which explores the significance of the effect of environmental waste management cost (EWMC) on the Net Asset Per Share (NPS) of listed industrial goods firms on the Nigeria Stock Exchange Group, are as follows. The R-squared value of 0.246720 indicates that the model explains approximately 24.7% of the variability in Net Asset Per Share, and the adjusted R-squared value of 0.231189 accounts for the adjustment in the presence of multiple predictors. Furthermore, the Rn-squared of 687.5127 with a corresponding p-value of 0.000000 underscores the overall significance of the

regression model. The control variable being firm size (FSZ) has a coefficient value of 13.64753, and the p-value is 0.0000, suggesting a statistically significant positive relationship between firm size and Net Asset Per Share.

The coefficient for environmental waste management cost (EWMC) is 9.020704. This suggests that an increase in EWMC by a margin will increase NPS by 9.020704. The associated p-value is 0.0000, which is less than the significance level of 0.05. This indicates that environmental waste management cost has a statistically significant positive effect on Net Asset Per Share. Therefore, the alternate hypothesis was accepted that environmental waste management cost has a significant positive effect on the Net Asset Per Share of listed industrial goods firms on the Nigeria Stock Exchange Group (p -value = 0.0000).

4.3 Discussion of Findings

4.3.1 Environmental Prevention Cost and Price/Earnings Ratio:

The finding that environmental prevention cost has a significant positive effect on the price/earnings ratio of listed industrial goods firms on the Nigeria Exchange Group suggests that investors perceive proactive environmental measures as value-enhancing. When firms invest in preventing environmental issues, such as pollution control or sustainable resource management, they may reduce the risk of future liabilities, regulatory fines, or negative public perception. This, in turn, can boost investor confidence, leading to a higher price/earnings ratio. Investors may view firms with strong environmental prevention measures as more sustainable and responsible, contributing to a positive impact on their market valuation. This result of a positive significant effect aligns with the studies by Kannaya (2015); Bassey et al (2013); although it disagrees with the finding by Ifurueze et al. (2013).

4.3.2 Environmental Protection Cost and Earnings per Share (EPS):

The positive relationship between environmental protection cost and Earnings per Share (EPS) indicates that the expenditures on protecting the environment contribute positively to a firm's profitability. Firms that invest in environmentally friendly practices, such as adopting cleaner technologies or eco-friendly production processes, may experience operational efficiencies and cost savings in the long run. Additionally, consumers and investors increasingly prefer environmentally responsible businesses, creating opportunities for market growth and increased profitability. The positive impact on EPS suggests that environmental protection is not just a corporate social responsibility but can also be a financially rewarding strategy. Similar findings were realised by Kannaya (2015); Bassey et al (2013); but negates the finding by Ifurueze et al. (2013).

4.3.3 Environmental Waste Management Cost and Net Asset per Share:

The significant positive effect of environmental waste management cost on Net Asset per Share suggests that responsible waste management practices contribute to the overall asset value of listed industrial goods firms on the Nigeria Stock Exchange Group. Effective waste management can minimize the risk of environmental contamination and associated liabilities, preserving the company's assets. Moreover, efficient waste management practices may also generate additional revenue streams through recycling or waste-to-energy initiatives, further enhancing the net asset per share. Investors may perceive firms with strong waste management strategies as having a more sustainable and resilient business model, leading to a positive impact on their net asset per share. This result contradicted the findings by Ifurueze et al. (2013) but agrees with those by Kannaya (2015); Bassey et al (2013).

5. Conclusion and Recommendation

Environmental management has become an increasingly critical aspect of business sustainability efforts, driven by global concerns about climate change, and corporate social responsibility. As businesses strive to align with environmental regulations and societal expectations, the impact of environmental management costs on value of firms has gained attention. This study was carried out to assess the effect of environmental management costs on the firm value of listed industrial goods firms on the Nigeria Exchange Group.

The findings of the study revealed that environmental management costs affect firm value significantly and positively. Investors value companies that actively engage in preventing environmental damage as this has a positive correlation with the price/earnings ratio which indicates that investors perceive these efforts positively, possibly viewing them as indicators of long-term sustainability and responsible corporate behavior. Thus, to enhance the price/earnings ratio of listed industrial goods firms on the Nigeria Exchange Group, it is recommended that firms strategically invest in environmentally sustainable practices and technologies that align with corporate sustainability as such firms may be considered less risky, leading to a higher valuation in terms of the price/earnings ratio.

Also, spending on environmental protection contributes to increased profitability on a per-share basis. This outcome aligns with the idea that environmentally conscious practices can enhance operational efficiency, reduce regulatory risks, and improve brand

reputation, leading to increased earnings. Investors may interpret this as a signal of sound management and anticipate continued financial success, thus positively influencing the EPS. Industrial goods firms in this light are therefore advised to consider environmental protection initiatives as integral to their overall financial performance, with the implementation of eco-friendly practices and technologies potentially contributing to positive environmental outcomes and enhancing profitability, thereby positively affecting shareholder value.

Firms investing in waste management are enhancing their overall asset value on a per-share basis. Effective waste management not only addresses environmental concerns but also has the potential to unlock economic value by improving resource utilization and reducing future liabilities. Investors may view this positively, recognizing the long-term benefits of sustainable waste management practices and attributing a higher value to the company's net assets on a per-share basis.

Finally, the positive effect of environmental prevention, protection, and waste management costs on the different firm financial indicators for listed industrial goods firms on the Nigeria Exchange Group reveals the importance of environmental management in shaping firm value. Investors appear to recognize the financial benefits associated with environmentally responsible practices, indicating a growing awareness of the nexus between environmental sustainability and corporate performance. Therefore, proactive environmental measures, such as prevention, protection, and waste management, not only contribute to sustainability and corporate social responsibility but can also enhance financial performance and firm value.

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