
Effect of Employee Health and Safety Cost on Profitability of Listed Oil and Gas Companies in Nigeria

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Received: 25 November 2023 **Accepted:** 10 February 2024 **Published:** 26 March 2024

Abstract: *The present study employed an ex-post facto research design to investigate the impact of employee health and safety costs on the profitability of oil and gas companies listed on the Nigerian Exchange Group (NXG) in 2023. Utilizing data analysis techniques such as descriptive statistics, Pairwise Granger Causality Tests, Panel unit root tests, and Ordinary Least Squares (OLS) regression analysis through E-view-9 software, the study fills gaps in previous research by focusing specifically on this underexplored aspect of corporate expenditure. Through purposive sampling, the study ensures a comprehensive analysis of companies with up-to-date financial reports, enhancing the reliability and validity of the findings. The study found that there is insufficient evidence to conclude that employee health and safety costs have a significant direct effect on profitability for the listed oil and gas companies in Nigeria within the examined timeframe. By adopting a rigorous research methodology and statistical approach, the study provides valuable insights into the relationship between employee health and safety costs and profitability in the Nigerian oil and gas sector, contributing significantly to the existing literature and advancing understanding in this field. The study further suggested that oil and gas companies should implement proactive safety measures, such as regular training and equipment upgrades, to prevent workplace accidents and reduce associated costs. Also, they should enhance transparency by integrating employee health and safety metrics into sustainability reporting frameworks to build stakeholder trust and accountability.*

Keywords: *Employee Health & Safety Costs, Profitability.*

1. INTRODUCTION

The profitability of oil and gas companies in Nigeria is intricately tied to a complex interplay of domestic and global factors. These companies, operating within Africa's largest oil-

producing nation, face unique challenges and opportunities. Nigeria's economy heavily relies on oil exports, making the profitability of its oil and gas sector crucial for overall economic stability. However, fluctuations in global oil prices, regulatory uncertainties, security concerns, and infrastructural limitations pose significant hurdles (Davies et al., 2024). Despite being endowed with vast oil reserves, issues like oil theft, pipeline vandalism, and environmental degradation can impact profitability. Erinoso and Oyedokun (2022), revealed that employee health & safety has a significant effect on profits after tax (PAT) of oil and gas companies in Nigeria. Moreover, factors like government policies, taxation, and fiscal regimes further influence the financial performance of these companies. Yet, amid challenges, opportunities for growth persist, including potential for increased exploration and production activities, advancements in technology, and partnerships with international firms. More so, the profitability of listed oil and gas companies in Nigeria reflects a delicate balance between navigating complexities and capitalizing on opportunities within a dynamic industry landscape. Employee health & safety (EHS) costs are significant considerations for oil and gas companies in Nigeria, reflecting their commitment to sustainable and responsible operations in the midst of environmental and safety challenges. These costs encompass investments in pollution prevention, emissions control, workplace safety measures, and community engagement initiatives aimed at minimizing environmental impacts and ensuring the well-being of employees and surrounding communities. Ihenyen and Ikegima (2022), revealed that employee health and safety costs and profitability of listed businesses in Nigeria have a substantial association. Given the environmental and social sensitivities associated with the oil and gas industry, EHS costs are not only a regulatory requirement but also essential for maintaining the companies' social license to operate and reputation (Eze, 2021). Thus, understanding the allocation and management of EHS costs among listed oil and gas companies in Nigeria provides insights into their commitment to environmental stewardship, compliance with regulations, risk mitigation strategies, and long-term sustainability efforts. Moreover, transparency in reporting EHS costs enhances stakeholders' confidence in the companies' environmental and social performance, contributing to enhanced stakeholder relations and value creation in the Nigerian oil and gas sector.

The profitability of oil and gas companies in Nigeria faces multifaceted challenges stemming from both internal and external factors. These challenges include volatile global oil prices, regulatory uncertainties, security risks such as oil theft and pipeline vandalism, environmental degradation, and infrastructural limitations (Okutu & Adegbe, 2024). Additionally, government policies, taxation, and fiscal regimes further complicate the operational environment for these companies. According to Bamishe and Adegbe (2024), the combined impact of these factors creates significant hurdles for achieving and sustaining profitability within the Nigerian oil and gas sector. Thus, understanding and addressing these challenges is critical for developing effective strategies to enhance the financial performance and resilience of listed oil and gas companies in Nigeria. Specifically, the study sought determine the effect of employee health and safety cost on profit after tax of listed oil and gas companies in Nigeria.

2. RELATED WORKS

2.1 Conceptual Review:

Employee Health and Safety Cost: This is one of the areas that the organisation is working to improve in terms of sustainability. The primary goal of health and safety (H&S) is to ensure the physical and emotional well-being of all employees (Nwafor et al., 2021). Building and executing health and safety strategies, tracking performance issues, and reporting them to stakeholders both inside and outside the organisation are all part of this role, as are most others in management. Health and safety neglect can lead to costly consequences. The occurrence of occupational accidents has monetary consequences for all parties involved. The companies affected, the people directly affected, and society as a whole bear the financial burden of medical expenses and lost productivity. An estimated 4.6 million incidents occur in the workplace each year in the European Union, leading to 146 million hours of lost productivity, according to the European Agency for Safety and Health at Work (Eze, 2021). This amounts to a loss of from 2.6% to 3.8% of the total EU GNP on an annual basis. It seems to reason, though, that if these accidents could be prevented, their expenses could be avoided as well. Consequently, preventing workplace accidents should be good for society's economy and excellent for enterprises' bottom lines (Adesina, 2020). Injuries sustained by workers as a result of unexpected and violent incidents on the job are known as occupational accidents (Adesina, 2020). Ensuring and improving the physical and mental well-being of corporate employees is the primary goal of health and safety measures (Amahalu et al., 2017).

Profitability: Oil and gas firms' profitability is influenced by global oil prices, production costs, technical breakthroughs, regulatory regimes, and geopolitical dynamics. Oil price fluctuations can lead to increased profits, but also raise production costs and exploration charges. Low oil prices can limit profitability, causing cost reductions and project postponements. Regulations and geopolitical threats can also impact profitability. The shift towards greener energy sources and sustainable operations is affecting profitability, with investments in renewable energy, carbon capture technologies, and energy efficiency initiatives creating new revenue streams and lowering operational costs. However, initial capital expenses and disruptions to traditional business models can negatively impact profitability. Firms that adapt to these changes while maintaining operational efficiency and financial discipline are more likely to maintain long-term profitability.

Profit after tax: This is a crucial financial metric that indicates a company's net income after deducting all expenses, including taxes, from its total revenues. It reflects the efficiency of a company's operations in generating profits, its ability to sustainably grow its business, and its overall profitability. PAT provides valuable insights for investors and stakeholders to evaluate a company's financial health, performance, competitiveness, and make investment decisions. Additionally, environmental disclosure has been shown to have a significant impact on the profits after tax (PAT) of listed oil and gas companies in Nigeria, with the study suggesting that implementing environmentally friendly policies can improve the financial performance of these companies (Ngu, 2021; Erinoso & Oyedokun, 2022).

2.2 Theoretical Review

Stakeholder Theory (Freeman, 1983): The theory, as proposed by Freeman (1983) underscored the importance of effective management of an organization's relationships with various stakeholders, including creditors, managers, suppliers, customers, government, employees, and the public. This theory posits that focusing solely on the interests of stockholders or owners is insufficient, and that businesses must also consider the needs and concerns of non-financial stakeholders to ensure societal support and organizational sustainability. Within the context of listed oil and gas companies in Nigeria, stakeholder theory suggests that these companies should engage in environmental actions and activities that are valued by stakeholders beyond shareholders, such as government, communities, and environmental groups. Raymond et al. (2016) highlighted the significance of identifying and managing stakeholder relationships to advance the interests of the firm. Musa et al. (2015) further emphasized that stakeholders exert influence on companies and vice versa, and that stakeholders include various environmental agents. Effective management of stakeholders, as advocated by stakeholder theory, involves considering the interests of all stakeholders, regardless of their degree of influence, and aligning company needs with their environment.

2.3 Empirical Review

The empirical review highlighted the effect of environmental cost management on financial performance among listed oil and gas companies, drawing from a diverse range of studies spanning various geographical contexts and methodological approaches. Hence, in their 2023 study, Chinedu et al. explored how environmental costs influence the financial performance of Nigerian oil and gas firms. Analyzing financial data spanning from 2010 to 2019, the research uncovered that staff development expenses had a negligible negative impact on return on assets. Similarly, costs related to community development and employee health and safety showed positive effects, albeit insignificant ones. The objective of the study is to devise a comprehensive system for managing employee health and safety expenses to optimize productivity.

Akinleye and Olaoye (2021) examined the impact of community development costs on the return on assets of six Nigerian oil and gas firms. The data was collected from annual reports from 2010 to 2019. The study found that a 1 billion naira increase in community development cost led to a 0.7% increase in return on assets. This suggests that increased community development costs significantly influence the performance of Nigerian oil and gas firms. The study suggests that while community development engagement can lead to improved corporate performance, most firms in Nigeria are not fully utilizing this potential. Therefore, firms should be more objective in their community development efforts to enhance their performance.

The study by Ighosewe and Eferakeya (2021) found that sustainability reporting positively impacts firm performance in South Africa, with corporate environmental disclosure having a significant relationship, while employee disclosure has an insignificant association. The research recommends incorporating sustainability reporting in financial statements to boost financial performance by increasing sales revenue and competitive advantage.

Girón et al. (2020), investigated sustainability Reporting and Firms' Economic Performance: Evidence from Asia and Africa. Data were sourced from the sustainability disclosure database

and the Orbis database, and then subject it to statistical analysis through regression. The sustainability reporting has direct link with firms' performance.

Abdulrahman et al. (2021), studied the impact of environmental costs on the profitability of multinational oil and gas companies in Nigeria found that a 1% increase in environmental activities led to a 1.3% increase in Return on Asset (ROA). This suggests that investing in sustainability activities can provide significant competitive advantages, aligning with existing literature on sustainability reporting and financial performance. The study recommends that oil and gas firms invest more in environmental activities for enhanced growth and success.

In their 2023 research, Okoye and Erinugha examined the impact of environmental disclosure on the financial performance of Nigerian oil and gas enterprises listed between 2011 and 2021. The study analyzed panel data sourced from audited annual reports and accounts of these organizations. Findings unveiled a significant relationship between disclosure of employee health and safety, waste management, environmental protection, and monetary value added. The study proposes that companies should acknowledge, evaluate, and manage waste to create economic benefits for society, thereby lowering production costs and ensuring sustained financial prosperity.

Osazefua (2019) studied how operational efficiency affects the financial sustainability of manufacturing companies listed in Nigeria. An additional panel dataset covering the years 2009 to 2016 for 16 manufacturing companies listed on Bloomberg was acquired and examined using the Ordinary Least Square approach. The study showed that operating expenses had a negative association with ROA, but asset turnover had a positive link with ROA. The expansion of employees, account receivables, turnover, and inventory turnover were deemed unimportant. Regarding Tobin's Q, both inventory and asset turnover showed a strong positive correlation. Operating expenses exhibited a strong negative correlation.

Akparhuere (2019) conducted a study on Nigerian listed firms' environmental reporting practices, using 84 respondents and analyzing both primary and secondary data. The study found a significant relationship between accounting practices and the performance of Oil and Gas Companies, particularly in terms of return on assets and return on capital employed. The findings suggest that environmental reporting can enhance the overall performance of listed firms.

Okegbe and Ofurum (2019) empirically examined the effect of environmental management accounting and financial performance of Nigerian consumer goods firms. The study employed ordinary least square regression estimation technique and found that environmental restoration cost, pollution prevention cost and environmental protection cost have effect on return on assets of quoted Nigerian consumer goods firms.

Oranefo's 2021 study examined the impact of environmental costs on the performance of Nigerian oil and gas companies. The research, based on financial statements from 11 companies from 2008-2019, found that waste management and community development costs had a significant positive effect on Tobin's Q of these companies. The study recommends increased involvement in waste management activities for improved organizational performance. The findings highlight the importance of environmental costs in the oil and gas industry.

2.4 Gap in Literature

The present study addresses several gaps in previous research on the relationship between employee health and safety costs and the profitability of oil and gas companies in Nigeria. Firstly, while previous studies have examined the impact of environmental costs and community development costs on financial performance, there has been limited focus on the specific influence of employee health and safety costs. By specifically investigating this aspect, the present study filled a gap in the literature by providing insights into a crucial yet understudied dimension of corporate expenditure in the oil and gas sector. Secondly, the use of a purposive sampling technique in selecting the sample companies allows for a more focused and targeted analysis, ensuring that only companies with up-to-date financial reports covering all relevant variables are included. This approach enhances the reliability and validity of the study's findings by minimizing potential data inconsistencies or gaps. Additionally, the adoption of a rigorous research design, including ex-post facto methodology and statistical analysis techniques such as Pairwise Granger Causality Tests and Panel unit root tests, adds methodological robustness to the study, thereby addressing concerns about the reliability and validity of previous findings. Overall, by systematically examining the relationship between employee health and safety costs and profitability within the Nigerian oil and gas industry using a comprehensive research design and analytical approach, the present study contributes significantly to filling gaps in the existing literature and advancing our understanding of the factors influencing financial performance in this sector.

3. METHODOLOGY

This study utilised an ex-post-facto research strategy due to the preexistence of the data, which prevented researchers from manipulating outcomes and eliminated potential researcher bias, ensuring reliable conclusions. The study included nine Oil and Gas businesses listed on the Nigerian Exchange Group (NXG) in 2023. The sample size of this study consisted of four (4) Oil and Gas companies listed on the Nigerian Exchange Group, 2023 whose annual financial reports are up-to-date and cover all the variables adopted in this study. The companies include Eternal, Total Energy, Oando, Cornoil. The sample size was drawn employing purposive sampling technique. Purposive sampling is valuable when the researcher wants to gain in-depth insights into a specific phenomenon, explore diverse perspectives, or focus on a particular subgroup within the population. This technique was employed because of its low-cost appeal, ease of convenience, less time-consuming nature and ideal for exploratory research design. The data analysis method used descriptive statistics, Pairwise Granger Causality Tests, Panel unit root test and Ordinary least square (OLS) regression analysis with the help of E-view-9 software. The statistical tests included the coefficient of determination R², Durbin-Watson (DW), F-ratio, and t-test, with a significance level of 5% (0.05). 3.6. The model is expressed as follows:

$$PAT_{it} = \beta + \log \beta_1 \log EHSC_{it} + \epsilon_{it}$$

Where:

PAT = Profit After Tax

EHSC = Employee health and safety cost

T = Time period under study

Log = Natural log of the variables

β = constant.

4. RESULTS AND DISCUSION

4.1. Data Analysis

The data analysed here were the properties of employee health and safety cost and financial performance (profit after tax) of listed oil and gas companies in Nigeria.

Table 4.1: Descriptive Statistics

	PAT	EHSC
Mean	6.252478	4.674328
Median	6.257304	4.775716
Maximum	8.137507	5.593396
Minimum	2.260071	3.040602
Std. Dev.	1.065226	0.653146
Skewness	-1.261324	-0.498852
Kurtosis	6.574248	2.508316
Jarque-Bera	30.30342	1.958845
Probability	0.000000	0.375528
Sum	237.5942	177.6245
Sum Sq. Dev.	41.98414	15.78421
Observations	40	40

Source: Computed using Eview9

The table presented descriptive statistics pertaining to two variables: "PAT" (Profit After Tax) and "EHSC" (Employee Health and Safety Cost) for listed oil and gas companies in Nigeria. These statistics offer insights into the distribution and characteristics of these variables within the sample.

Firstly, looking at the means, we observed that the mean PAT stands at 6.252478 billion Naira, indicating the average profitability level of these companies, whereas the mean EHSC is 4.674328 billion Naira, representing the average expenditure on employee health and safety costs. The median values, which are close to the means, suggest that the data is not heavily skewed by outliers.

Examining the variability of the data, we see that the standard deviation for PAT is 1.065226, indicating a moderate degree of dispersion around the mean profitability, while EHSC has a lower standard deviation of 0.653146, suggesting less variability in health and safety costs across the sample companies. Furthermore, the skewness values provide insights into the symmetry of the distribution. A negative skewness for both variables indicates that the distributions are skewed to the left, implying that there are more data points with higher profitability and lower health and safety costs compared to the mean. The Kurtosis values

reflect the peakedness of the distribution. The relatively high kurtosis for PAT (6.574248) suggests a heavy-tailed distribution with more extreme values, possibly indicating volatility in profitability among the listed oil and gas companies. Meanwhile, the lower kurtosis for EHSC (2.508316) implies a less pronounced peakedness in the distribution of health and safety costs. Additionally, the Jarque-Bera test and its associated probability values assess the normality of the data distribution. The significant p-value ($p < 0.05$) for PAT indicates non-normality, suggesting that the profitability data is not normally distributed. Conversely, the non-significant p-value for EHSC ($p > 0.05$) suggests that the distribution of health and safety costs may be closer to normal.

In conclusion, the data suggests that there is variability in profitability among listed oil and gas companies in Nigeria, with significant expenditure on employee health and safety costs. While profitability shows greater variability and non-normality, health and safety costs appear to be more stable and potentially normally distributed. This underscores the importance of managing health and safety costs effectively to maintain profitability in the oil and gas sector in Nigeria.

Table 4.2: Pairwise Granger Causality Tests

Date: 03/03/24 Time: 12:53			
Sample: 2013 2022			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
EHSC does not Granger Cause PAT	28	0.02315	0.9771
PAT does not Granger Cause EHSC		0.19874	0.8212

Source: Computed using Eview9

The table presents the results of pairwise Granger causality tests examining the relationship between employee health and safety costs (EHSC) and profitability (PAT) of listed oil and gas companies in Nigeria from 2013 to 2022 with a lag of 2 years. The null hypotheses tested are that EHSC does not Granger cause PAT and that PAT does not Granger cause EHSC. The findings show that EHSC does not Granger cause PAT, with a high F-statistic of 0.02315 and a probability of 0.9771, indicating no causality from EHSC to profitability. Similarly, PAT does not Granger cause EHSC, with an F-statistic of 0.19874 and a probability of 0.8212, suggesting no causality from profitability to EHSC. These results suggest no significant causal relationship between EHSC and PAT among listed oil and gas companies in Nigeria, indicating that while EHSC is important for ethical and regulatory compliance, it does not have a direct impact on profitability in this context.

Table 4.3: Panel unit root test: Summary

Series: PAT				
Date: 03/03/24 Time: 12:54				
Sample: 2013 2022				
Exogenous variables: Individual effects				
User-specified lags: 0				
Newey-West automatic bandwidth selection and Bartlett kernel				
			Cross-	
Method	Statistic	Prob.**	sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.00654	0.0013	4	40
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.44703	0.3274	4	40
ADF - Fisher Chi-square	8.70443	0.3678	4	40
PP - Fisher Chi-square	8.50974	0.3853	4	40

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: Computed using Eview9

Panel unit root tests on profit after tax for Nigerian oil and gas companies from 2013-2022 show stationarity under a common unit root process. However, individual tests do not show significant results, suggesting potential heterogeneity in the long-term relationship between employee health and safety costs and profitability, requiring further investigation.

Table 4.4: Model estimation of employee health and safety cost on PAT

Dependent Variable: PAT				
Method: Panel Least Squares				
Date: 03/03/24 Time: 12:49				
Sample: 2013 2022				
Periods included: 10				
Cross-sections included: 4				
Total panel (balanced) observations: 40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.737008	1.279999	5.263292	0.0000
EHSC	-0.103658	0.271270	-2.382121	0.7046
R-squared	0.674040	Mean dependent var		6.252478
Adjusted R-squared	0.523626	S.D. dependent var		1.065226
S.E. of regression	1.077736	Akaike info criterion		3.038798
Sum squared resid	41.81454	Schwarz criterion		3.124987
Log likelihood	-55.73716	Hannan-Quinn criter.		3.069463

F-statistic	0.146016	Durbin-Watson stat		1.795807
Prob(F-statistic)	0.704618			

Source: Computed using Eview9

The table presented the results of a panel least squares model estimation assessing the effect of employee health and safety costs (EHSC) on the profitability (PAT) of listed oil and gas companies in Nigeria over the period from 2013 to 2022. The model includes a constant term (C) and EHSC as the independent variable. The coefficient for EHSC is -0.103658, with a standard error of 0.271270 and a t-statistic of -2.382121. However, the associated probability for EHSC is 0.7046, indicating that the coefficient is not statistically significant at conventional levels. This suggests that there is insufficient evidence to conclude that employee health and safety costs have a significant direct effect on profitability for the listed oil and gas companies in Nigeria within the examined timeframe. The model's goodness of fit is moderate, with an R-squared of 0.674040, indicating that approximately 67.4% of the variability in profitability is explained by the included variables. Overall, the results suggest that while there may be some association between employee health and safety costs and profitability, it is not statistically significant in this model, highlighting the need for further investigation into other potential factors affecting profitability in the oil and gas sector in Nigeria.

4.2 Discussion of Findings

The research findings indicate that there is an insignificant direct effect of employee health and safety costs on the profitability of listed oil and gas companies in Nigeria. This aligns with previous studies by Chinedu et al. (2023) and Okoye and Erinugha (2023) which also found either positive but insignificant effects or a correlation without direct causal impact on financial performance. The complexity of the relationship between health and safety costs and financial performance is highlighted, suggesting that while these measures are important for ethical and regulatory compliance, they may not directly influence profitability in the Nigerian oil and gas sector. Additionally, the study's results are consistent with broader literature on the positive effects of environmental activities on firm performance, as shown in studies by Abdulrahman et al. (2021) and Oranefo (2021). This underscores the need for further research to understand the specific mechanisms through which employee health and safety initiatives impact financial outcomes in the oil and gas industry in Nigeria.

5. CONCLUSION

The present study employed an ex-post facto research design to investigate the impact of employee health and safety costs on the profitability of oil and gas companies listed on the Nigerian Exchange Group (NXG) in 2023. Utilizing data analysis techniques such as descriptive statistics, Pairwise Granger Causality Tests, Panel unit root tests, and Ordinary Least Squares (OLS) regression analysis through E-view-9 software, the study fills gaps in previous research by focusing specifically on this underexplored aspect of corporate expenditure. Through purposive sampling, the study ensures a comprehensive analysis of companies with up-to-date financial reports, enhancing the reliability and validity of the findings. The study found that there is insufficient evidence to conclude that employee health

and safety costs have a significant direct effect on profitability for the listed oil and gas companies in Nigeria within the examined timeframe. By adopting a rigorous research methodology and statistical approach, the study provides valuable insights into the relationship between employee health and safety costs and profitability in the Nigerian oil and gas sector, contributing significantly to the existing literature and advancing understanding in this field. The study further suggested that oil and gas companies should;

1. Implement proactive safety measures, such as regular training and equipment upgrades, to prevent workplace accidents and reduce associated costs.
2. Enhance transparency by integrating employee health and safety metrics into sustainability reporting frameworks to build stakeholder trust and accountability.
3. Foster collaboration with industry peers and regulatory bodies to share best practices and collectively address common health and safety challenges, improving industry-wide standards and performance.

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