Environmental Risk Management and Financial Performance in Listed Multinational Firms in Nigeria

Azeez Oyebanji Abiola[1], Igbekoyi Olusola Esther[2], Adeyemo Foluke Helen[3]

[1,3]Afe Babalola University, Ado Ekiti, Ekiti, Nigeria

[2]Department of Accounting, Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria

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ABSTRACT

The study investigated the environmental risk management and financial performance in listed multinational firms in Nigeria considering the compliance with environmental regulations and minimizing environmental liabilities to avoid financial losses and reputational damage. This study employed ex-post facto research design. The population of this study comprised 46 firms listed on the Nigerian Exchange (NGX) as at 31st December, 2023. The entire population was selected as sample size using census sampling technique. Data were collected using secondary source. Spanning twelve years, from 2012 to 2023, the research aimed to observe long term trends and performance patterns. Data analysis was descriptive and inferential. The regression analysis showed that that environmental conservative practices had an insignificant negative effect on the return on assets (ROA) for listed multinational firms in Nigeria suggesting that adopting such practices does not play a critical role in enhancing financial performance. Conversely, risk assessment disclosures had a negative but significant effect on financial performance by showing a complex relationship between transparency and profitability. Disclosing environmental compliance, the findings showed a significantly negatively effects on return on assets which suggested that adherence to environmental regulations may impose considerable financial burdens on multinational firms in Nigeria. It was recommended that multinational firms participate in disclosures on environmental management efforts to boost investor confidence.

Keywords: Environmental risk management, environmental conservation practices, environmental assessment disclosures, environmental compliance, financial performance.

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INTRODUCTION

The critical aspect of evaluating a company's health and sustainability in today's business landscape is financial performance. Most companies are continuously striving to optimize their financial performance, aiming for profitability, growth, and shareholder value maximization (Owolabi et al., 2022). However, achieving and maintaining strong financial performance is not without its challenges, many of which originate from complex ecological hazards and considerations (Uwalomwa & Omogbemi, 2022). Most of these hazards have direct impact on the financial health of most businesses. One of the primary financial issues that listed multinational companies face is the cost of compliance with governmental requirements (Sam, 2019). Government enforces various directives governing industries from emissions standards to waste disposal protocols. Compliance with these directives necessitates substantial investments in technology, infrastructure, and operational adjustments. These costs can directly impact a company's financial statements, affecting profitability and cash flows (Adamkaite et al., 2022).

Furthermore, some Nigerian companies do not comply with financial regulations which can lead to fines, penalties, and legal expenses, further straining financial resources and negatively impacting financial performance (Adamkaite et al., 2022). These fines and penalties can erode profit margins, reduce available capital for investment, and ultimately hamper growth prospects. In addition, the reputational damage associated with regulatory breaches can deter potential investors, exacerbate financial instability, and undermine stakeholder trust (Wei-Lun &Yan-Kai 2018). More so, achieving optimal financial performance can

necessitate several other critical issues, such as economic volatility, market competition, and operational inefficiencies. Economic volatility can lead to unpredictable revenue streams and increased costs, making it challenging for companies to maintain healthy financial consistency. Market competition requires businesses to continuously innovate and improve efficiency to maintain their competitive edge, which often entails significant financial outlays (Onyekachi et al. 2020).

Operational inefficiencies, on the other hand, can result in higher production costs, wastage, and reduced profitability. These challenges can have significant consequences on profitability and growth, leading to decreased investor confidence and diminished ability to attract and retain capital (Igbekoyi et al., 2021). The convergence of these issues underscores the complexity of maintaining robust financial performance. Companies must navigate a dynamic business environment, balancing regulatory compliance with strategic initiatives to drive growth and profitability (Samuel et al., 2020). By addressing economic volatility, market competition, and operational inefficiencies, businesses can enhance their financial stability and resilience. More so, proactive environmental risk management is increasingly recognized as a critical component of this equation. Integrating environmental considerations into business strategies can mitigate risks, reduce costs associated with environmental liabilities, and open new opportunities for sustainable growth (Igbekoyi et al., 2021; Samuel et al., 2020).

Therefore, a holistic approach to financial performance that encompasses regulatory compliance, operational efficiency, and environmental management is essential for long-term success in today's competitive landscape. Companies have to contend with potential asset impairment due to environmental risks management (Adegbie, 2020). Environmental incidents, such as pollution events or natural disasters, can damage physical assets like property, plant, and equipment. The impairment of these assets requires companies to recognize losses on their financial statements, reducing asset values and impacting profitability metrics (Chiamogu & Okoye. 2020). Furthermore, supply chain disruptions resulting from environmental risks can lead to production delays, increased costs, and revenue losses, all of which can hamper financial performance (Ordu & Amah 2021).

These disruptions not only affect operational efficiency but also strain financial resources required for recovery and mitigation efforts. One significant issue is the underestimation of environmental risks management, which can lead to substantial financial repercussions. For instance, companies that fail to address environmental concerns may face regulatory fines, cleanup costs, and reputational damage. These consequences not only impact their financial performance but also jeopardize long-term sustainability (Samuel et al., 2020). Also, the traditional focus on short-term financial metrics often overlooks the strategic importance of managing environmental risks.

Similarly, studies have explored the correlation between environmental risk management and financial performance, which are crucial for investor confidence and market efficiency. Ozordi et al. (2018) analyzed the impact of environmental risk management gender diversity and sustainability responsiveness as study focus on deposit money banks. The results indicate that firms that integrate environmental risk management into their business operations report higher financial performance, particularly in terms of sales growth and profitability. The study suggests that environmental risk management practices contribute to operational efficiency and resource optimization. Egolum (2021) focused on the oil and gas sector, examining how environmental management affects financial performance in non-financial sector firms. The findings reveal that companies with comprehensive environmental management policies tend to have better financial performance, measured by market share and revenue growth. The study also notes that investor confidence is higher in firms with strong environmental management systems, translating to better financial health.

Ani et al. (2022) investigated the effect of predictive comparison of environmental management on the efficient tools in modeling degradation of total petroleum hydrocarbon in financial system of listed firms. Using panel data analysis from 2015 to 2021, the study found a significant positive impact of environmental management on financial performance indicators like earnings per share (EPS) and net profit margin (NPM). The research concluded that environmental management scheme enhances corporate resilience and competitiveness. The results of this study prove that companies that implement and report their environmental

performance or green performance in environmental reporting or green accounting in Indonesia have an influence on the company's image in the eyes of company stakeholders.

On the contrary, Ding et al. (2022) studied environmental compliance in multinational firms in Nigeria as the study focuses on significant costs which are related to environmental compliance, including investments in cleaner technologies, waste management systems, and pollution control measures. These costs often lead to reduced profitability, especially in the short term and that firms that allocate substantial resources to environmental risk management may experience a decline in their competitive edge. The research indicated that companies with high cost of environmental compliance were less able to compete on price, leading to a loss of market share. The findings of Setiawan (2020) suggest that while environmental risk management is crucial for sustainable development, it may pose significant financial challenges for multinational firms. The study recommends a balanced approach, where regulatory frameworks support environmental protection without imposing excessive burdens on businesses.

Additionally, it calls for more innovative and effective solutions to environmental management that can enhance both sustainability and financial performance. The results of many previous studies have been contradictory and inconsistent, likely due to variations in conceptual approaches, methodologies, data availability, study scopes, and the variables considered. Overcoming these challenges and resolving the inconsistencies in past research is essential for providing reliable solutions to financial performance issues.

Therefore, this study examined the effect of environmental risk management on financial performance in listed multinational firms in Nigeria. The specific objectives are to:

- investigate the effect of environmental conservation practices and financial performance in listed multinational firms in Nigeria;
- evaluate the effect of environmental assessment disclosures and financial performance in listed multinational firms in Nigeria; and
- assess the effect of environmental compliance and financial performance in listed multinational firms in Nigeria.

This study is particularly pertinent now, as many listed multinational companies in Nigeria are navigating a complex environment where environmental factors can greatly influence their financial results (Afolabi et al., 2024). These factors include the costs of regulatory compliance, challenges in resource management, and reputational risks from environmental issues. Therefore, it is essential for these firms to understand the relationship between managing environmental risks and financial performance to succeed in this dynamic setting.

LITERATURE RIVIEW

Aligned with the study's objectives, this section reviews relevant literatures and research findings concerning the relationship between environmental risk management and financial performance in listed multinational firms in Nigeria.

Conceptual Review

This research examined pertinent literature concerning environmental risk management and financial performance in accordance with the study objectives, which include to examine the effect of environmental risk management practices on the financial outcomes of multinational firms in Nigeria, identifying the key factors influencing this relationship, and evaluating the differences in these impacts across various industries and geographical regions. The review provides a comprehensive understanding of the existing theoretical frameworks, empirical findings, and methodological approaches used in prior studies, thereby highlighting the gaps and opportunities for future research

Financial Performance

Fatihudin (2018) described financial performance as the achievement of the company's financial sustainability for a certain period covering the collection and allocation of finance measured by capital adequacy, liquidity, solvency, efficiency, leverage and profitability. Financial performance, the company's ability to manage and control its own resources. Cash flow, balance sheet, profit-loss, capital change can be the basis of information for corporate managers to make decisions (Adegboyegun & Igbekoyi 2022). It is important to understand fundamental analysis and technical analysis, it is necessary to learn finance to understand the company's financial behavior through economics, financial management and accounting.

Abdulsalam et al. (2020) got a broader look in to exploring financial performance as a company's standing through analysis of its assets, liabilities, revenue, expenses, profit and more. Generally, financial performance analysis is based on four sources, the balance sheet, cash flow statement, income statement and, for publicly traded companies, 10-K or annual report. Whether you're doing in-house financial analysis or trying to show the value of your company to external investors or lenders, having a detailed understanding of the business's financial performance can help ensure that every stakeholder gets an accurate and in-depth picture.

Therefore, in this study, financial performance encompasses the measurement of reported financial indicators, commonly known as key performance indicators (KPIs), which are quantitative metrics employed to assess, monitor, and forecast the economic health of a business. These metrics serve as instruments for both internal stakeholders (such as management and board members) and external stakeholders (such as research analysts and investors) to evaluate the company's performance relative to competitors, and to identify its strengths and weaknesses (Igbekoyi & Oluwajuyigbe 2022).

Environmental Risk Management

Ahmed and Muhammed (2017) described environmental risk management (ERM) as the process by which financial institutions identify, appraise, control, transfer and monitor environmental risks. Environmental risk management may be applied to both individual credit transactions and to aggregate loan and investment portfolios. ERM helps to ensure that environmental risk is contained to acceptable levels, and ideally should be applied to all aspects of a mining operation in a structured process to ensure that all relevant issues are addressed. Criteria and objectives for risk assessment should be established. ERM helps to ensure that environmental risk is contained to acceptable levels, and ideally should be applied to all aspects of a mining operation in a structured process to ensure that all relevant issues are addressed (Antoun et al., 2018).

Wei-Lun and Yan-Kai (2018) stated that the criteria and objectives for risk assessment should be established during the planning stage. Results of monitoring should be fed into the risk assessment process to identify and reduce emerging problems as soon as possible. As ERM encompasses the entire mine project, multiple skills are needed and sufficient resources must be made available to do the job effectively. According to Umoren et al. (2018) the results of the risk analysis must be communicated effectively through the cloud system, and risk management recommendations should be implemented promptly for the ERM process to succeed. In the context of this study, environmental risk management encompassed costs associated with environmental conservation, environmental pollution, and environmental social impact.

Environmental Conservation Practices

Ajah and Adegbie (2023) described environmental conservation practices as strategies and actions aimed at preserving, protecting, and sustainably managing natural resources and ecosystems. These practices include reducing energy consumption through efficiency measures, minimizing waste generation and enhancing recycling efforts, and implementing sustainable agriculture and forestry techniques to maintain soil health and biodiversity. They also encompass protecting water quality through efficient use and treatment, mitigating air pollution by reducing emissions, and preserving wildlife and habitats through the establishment of protected areas and restoration projects. By adopting these practices, individuals, communities, and organizations contribute to the long-term health and sustainability of the environment. This view is supported by (Ghardallou 2022) and (Kaur & Lodhia 2018).

Nassani et al. (2021) also described environmental conservation practices as a range of activities designed to protect and sustainably manage natural resources and ecosystems. These practices aim to reduce human impact on the environment through measures such as conserving energy, managing waste, protecting water resources, and preserving biodiversity (Nassani et al., 2021). They include actions like utilizing renewable energy sources, promoting recycling and composting, implementing water-saving techniques, and maintaining green spaces. Additionally, conservation practices involve safeguarding habitats, restoring degraded ecosystems, and enforcing regulations that limit pollution. By adopting these practices, societies can ensure the health and resilience of the environment for future generations, balancing economic growth with ecological preservation.

To ensure effective control measures and implementation, there are obvious cost implications. To this end, environmental conservation practices are those related efforts associated with the preservation and maintenance of nature from pollution and degradation, air purity and water preservation from harm capable of causing injuries and harm to human beings, animals and trees (Norhasimah et al., 2015; Ondotimi & Ayesha, 2020). Efforts to reduce air and water pollution, and cost to implement policies to prevent or reduce emissions capable of reducing the natural state of the environment in relation to air, water, soil and forest are comprehensively categorized in this group. Environmental conservation practice is a key element of effective environmental risk management, ensuring that sustainable risk management practices are conducted without bias and in the best interests of the organization and its stakeholders.

Environmental Assessment Disclosures.

Alsaifi et al. (2020) described environmental assessment disclosure as transparently communicating the potential environmental impacts of an organization's operations or projects. This includes identifying specific environmental risks such as pollution, habitat destruction, and resource depletion. It details the methodologies used to assess these risks and outlines the measures implemented to mitigate them. The disclosure also encompasses ongoing monitoring efforts, the potential effects on financial performance, and engagement with stakeholders to address these concerns. This practice enhances transparency, supports informed decision-making, ensures regulatory compliance, and promotes sustainable development by integrating environmental considerations into business strategies (Al-Amin et al., 2019). These burdens manifest in numerous ways, including increased healthcare costs, reduced productivity, infrastructure damage, and lower property values. Furthermore, negative environmental assessment findings exacerbate social inequities, as marginalized communities frequently suffer the most from these adverse effects. (Al-Jaifi 2020).

Ani (2022) proactively stated that addressing these challenges through robust management strategies, stringent regulations, and innovative solutions, businesses and governments can collectively mitigate the negative consequences of environmental hazards. Such efforts not only safeguard public health and preserve delicate ecosystems but also stimulate economic growth by fostering sustainable development and creating new green job opportunities. Furthermore, investing in ecosystem preservation and remediation can enhance a region's reputation as an environmentally responsible and attractive place to live, as well as a desirable location for business within the community. Ultimately, a concerted commitment to environmental stewardship or management is essential for building resilient, equitable, and prosperous societies for present and future generations (Alami 2020). Given the widespread impacts of firm activities on the environment, firms are increasingly required to disclose environmental information.

However, the relation between environmental information disclosure and financial performance remains complex and multifaceted, influenced by factors such as regulatory requirements, stakeholder expectations, and the firm's commitment to sustainability practices. This relationship can vary significantly across industries and regions, making it a critical area of study for understanding how transparency in environmental reporting affects both environmental outcomes and business success (Wang et al., 2020).

Environmental Compliance

Brennan et al. (2021) referred specifically to environmental compliance as adhering to environmental laws, regulations, and standards. It involves ensuring that an organization’s operations do not harm the environment, such as controlling pollution, managing waste, conserving resources, and reducing carbon emissions.

Environmental compliance is a subset of regulatory compliance that focuses solely on environmental protection. Kolawole and Iyiola (2023) also supported that environmental compliance is the adherence to environmental laws, regulations, and standards set forth by governmental agencies or international bodies. It involves taking actions to minimize or prevent negative impacts on the environment, such as pollution, habitat destruction, and resource depletion. According to Ani (2022) environmental compliance is a fundamental component of sustainable development, crucial for safeguarding public health, preserving ecosystems, and ensuring the long-term viability of our planet.

It involves a range of activities aimed at reducing pollution, managing waste, conserving resources, and protecting biodiversity. Specifically, environmental compliance includes efforts to reduce emissions of pollutants into the air, water, and soil; ensure the proper handling, treatment, and disposal of waste materials; promote the efficient use of natural resources such as water, energy, and minerals; and preserve ecosystems and maintain species diversity (Bu et al., 2020). According to Wesseh et al. (2024) several key factors drive environmental compliance. Legal requirements are a primary influence, as governments enact laws and regulations designed to protect both the environment and public health. These legal frameworks compel organizations to meet specific standards, ensuring that their operations do not harm the environment. Economic incentives also play a crucial role by motivating businesses to adopt environmentally friendly practices. By reducing costs, improving operational efficiency, and enhancing their public image, companies find that compliance can be both economically beneficial and strategically advantageous.

Furthermore, Crossley et al. (2021) admitted that social responsibility acts as a powerful motivator for compliance. Many organizations now recognize that they have an ethical duty to minimize their environmental impact, and this sense of responsibility often drives them to implement sustainable practices beyond what is legally required. Together, these factors create a strong foundation for environmental compliance, ensuring that businesses and other organizations contribute positively to the preservation of our planet. Additionally, international agreements facilitate collaboration among countries to address global environmental challenges through treaties and conventions (Hickmann & Elsässer 2020). In an era of increasing environmental challenges, ensuring environmental compliance has become a paramount concern for governments, businesses, and individuals alike. The delicate balance between economic development and environmental protection demands a proactive and responsible approach (Ghardallou 2022).

Theoretical Review

A theory is a principle that has been formed as an attempt to explain things that have already been substantiated by data. It is used in the names of a number of principles accepted in the scientific community, such as the Big Bang Theory. Because of the rigors of experimentation and control, it is understood to be more likely to be true than a hypothesis is. Therefore, this study examined stakeholder theory and institutional theory, providing the theoretical foundation for this study.

Stakeholder Theory

This theory is the underpinning theory for this study and was proposed by R. Edward Freeman in 1984 in his book "Strategic Management: A Stakeholder Approach," which offers a comprehensive framework for understanding how managing environmental risks can influence a firm's financial performance through its relationships with various stakeholders (Freeman, 1984). This theory posits that a company's success hinges on effectively balancing the interests of stakeholders such as shareholders, employees, customers, suppliers, communities, and the environment, rather than solely maximizing shareholder value. By doing so, businesses can enhance their reputation, foster customer loyalty, boost employee morale, and gain better access to capital, all of which can ultimately impact financial performance positively.

However, in the context of environmental risk management and financial performance in listed multinational firms in Nigeria, stakeholders' theory proves particularly relevant due to its holistic perspective on corporate environments. It underscores the importance of considering not just shareholders but also the broader spectrum of stakeholders affected by a company's operations, including those impacted by environmental concerns. This approach aligns with the growing emphasis on environmental sustainability and corporate social responsibility,

enabling firms to better identify and mitigate risks associated with environmental impacts. Despite its advantages, stakeholder theory faces criticism and some limitations. Alami (2020) argued that it can be challenging to balance the often-conflicting interests of diverse stakeholders, especially when environmental concerns compete with profit maximization goals. Al-Jaifi (2020) also contended that the theory lacks clear operational guidelines for identifying and prioritizing stakeholders, as well as for measuring the precise impact of stakeholder management on financial performance.

More so, some school of thought suggested that an excessive focus on meeting the demands of powerful stakeholders could lead to short-term gains at the expense of long-term sustainability and environmental responsibility (Fatihudin, 2018). It also has certain limitations: identifying who qualifies as a stakeholder can be challenging and subjective, balancing the competing interests of different stakeholders necessitates difficult decisions, and quantifying the impact of stakeholder management on financial performance can be complex. Kaur and Lodhia (2018) suggested that although stakeholder theory provides valuable insights into how managing environmental risks can affect financial performance through stakeholder relationships, its application demands careful consideration of its limitations and challenges.

Institutional Theory

The study also considered institutional theory as proposed by John Mayer and Brian Rowan in 1970 (Ajah & Adegbie, 2023). The financial stability of companies largely depends on strong institutions and compliance to constituted authorities when there are strong institutions to enforce compliance. Institutional theory is concerned with the working ability of every facet of an institution that would allow smooth operations of the organization and protection of human rights as well as contractual rights. Some assumptions of the institutional theory tend to exhibit similar characteristics. According to Ahmad et al. (2022), institutions are the outcome of their constituted governance structure, the true reflection of instituted rules and social order, social conduct, and the ability to enforce their implementations. The institutional theory further assumes that groups and corporate bodies conforming to these constituted rules are given legitimacy and accorded recognition of their services.

The legitimacy of a corporate organization is significant as the going concern of the organization largely depends on the acceptance of its products and services. Hence, the survival of an organization is essentially important for its continuous existence. Akben-Selcuk (2019) noted that the institutional theory assumes that the effectiveness or otherwise of an institution depends on the corporate governance and those in charge of its affairs. Some supporters of the institutional theory believe that other studies by Arayssi et al., (2016) have widely documented in the literature the significance of strong institutions to achieve organizational goals. The effectiveness of every government and the quality of corporate governance largely depends on the effectiveness of institutions in enforcing laws, rules and regulations in the society as well as in the organization. Ajah and Adegbie (2023) backed the institutional theory and pointed out that a lot of companies in the United States adopted this theory from 1880 to 1935, to support them organizational survival and performances (Arrays' et al., (2016).

Empirical Review

This study reviewed relevant literature on environmental risk management and financial performance, aligning the analysis with the study's specific objectives and formulated hypotheses.

Environmental Conservation Practices and Financial Performance

The relationship between environmental conservation practices and financial performance examines how investments in sustainable practices and environmental initiatives can impact a firm's profitability, operational efficiency, and overall financial health. This relationship is analyzed to determine whether the costs associated with environmental conservation led to tangible financial benefits, such as cost savings, improved market reputation, increased investor interest, and compliance with regulatory requirements (Alsaifi et al., 2020). Ultimately, the goal is to assess whether the financial gains from enhanced environmental performance outweigh the expenditures involved in conservation efforts (Wang et al., 2020).

Pham et al. (2021) studied the impact of conservation practices on financial performance empirical evidence from Sweden. Findings indicate a positive relationship between environmental conservation practices and financial performance that is measured by earnings yield, return on asset, return on equity and return on capital employed. However, when it comes to a market-based financial measure, Tobin's Q, the result is inconclusive. Finally, to improve financial performance, firms are recommended to engaging in Dow Jones Sustainability Index, prepare their sustainability report in accordance with Global Reporting Initiative (GRI) Standards, improve their environmentally sustainable growth rate, as well as keep a high position in the corporate social responsibility ranking.

However, Boakye et al. (2020) investigated sustainable environmental practices and financial performance: Evidence from listed small and medium-sized enterprises in the United Kingdom. Business Strategy and the Environment. Their study found out that some existing literature indicates that there is a direct relationship between sustainable environmental practices and financial performance. However, studies looking at this relationship have focused mainly on large firms with little attention paid to SMEs. Further, those looking at environmental and financial performance relationships have often used a single measure of performance in their studies. This study bridges these research gaps by focusing on listed SMEs in the United Kingdom using multiple measures of sustainable environmental policy indices on a panel of 201 SMEs on the Alternative Investment Market from 2011 to 2016.

Evidence from panel data analysis suggests significant and a nonlinear (concave) relationship between sustainable environmental practices and firms' financial performance. Specifically, energy efficiency practices, greenhouse gases, material, and resource efficiency revealed an inverted U-shaped relationship with financial performance. The results will offer guidance to management in terms of allocating resources to sustainable environmental practices investment.

Kiarie and Kimunguyi (2018) analyzed the influence of Financial Reporting Instruments on the Financial Performance of Environmental Conservation Ngo's at Nairobi City County in Kenya. The study found that financial reporting instruments disclosure had a positive and significant influence on the financial performance of environmental conservation NGOs at Nairobi City County in Kenya. Thus, financial reporting instruments disclosure influence financial performance of environmental conservation NGOs at Nairobi City County in Kenya. Hence, NGOs should lean towards disclosure of financial and social and board disclosure to increase their performance. The study also found that financial reporting instruments presentation had a negative but marginally insignificant influence on financial performance of environmental conservation NGOs at Nairobi City County in Kenya. The results also showed that financial reporting instrument recognition and measurement had a positive and significant influence on financial performance of environmental conservation NGOs at Nairobi City County in Kenya.

Jin et al. (2021) argued that with the implementation of a series of policies related to the environmental conservation practices, energy conservation and environmental protection (ECEP) industry, green finance has become a crucial approach to provide credits for the ECEP industry. Using data on Chinese-listed ECEP firms from 2010 to 2019, this work quantitatively identifies the financing efficiency of these firms and its determinants. The main results show that banks are still dominant in the Chinese financial market for providing credits, and firms listed on the second board show higher financing efficiency. The financing efficiency of firms located in the central and western regions improves significantly, especially after 2016, reflecting the interaction effect of green finance policies and economic policies supporting underdeveloped regions. These findings have important implications for policymakers who are carefully contemplating green finance policies to support ECEP firms through an effective financial market mechanism, which eventually helps to realize the transition of the energy sector.

However, this research intends to address several gaps in the existing literature on environmental conservation practices and its impact on the financial performance of listed multinational firms in Nigeria. Firstly, there is limited empirical evidence specifically focusing on listed multinational firms in Nigerian. Secondly, while previous studies have examined the relationship between environmental disclosure and financial performance, few have specifically explored the conservation practices, which encompasses broader environmental

disclosure and reporting. Thirdly, given the unique characteristics and challenges of the environmental practices of multinational firms in Nigeria, there is a need to investigate how environmental conservation practices which is a particular segment of environmental disclosure influence financial performance. Fourthly, there is a geographical gap identified. Most reviewed literatures were carried out outside the shore of Nigeria, however, this study is carried out in Nigeria. The hypothesis of this study is stated as follows:

H_{01}: Environmental conservation practices do not have a significant effect on financial performance of listed multinational firms in Nigeria.

Environmental Assessment Disclosures and Financial Performance

The link between environmental assessment disclosures and financial performance examines how firms manage and disclose their environmental impacts, the assessment control and remediation, and the effects these disclosures have on profitability, investor confidence, and long-term financial stability.

The research conducted by Alsaifi et al. (2020) focused on the number of companies in Indonesia that have participated in environmental-related activities that continues to grow. Some of these companies have also engaged and implemented an assessment program called Program for Pollution Control, Evaluation, and Rating (PROPER). This assessment program was initially launched by the Indonesian Ministry of Environment in 1995 to measure and rate the environmental performance of companies in Indonesia. They have also administered an environmental management system as part of their environmental protection initiatives. However, the level of environmental disclosure by these companies is still low. This may occur due to the current situation in which the companies are not obliged to incorporate environmental disclosures on their annual reports. For those companies that disclose their environmental performance, there is also no apparent reason on why they have done that.

This research aims to examine the effect of environmental performance, company financial performance, and company characteristics on environmental disclosure. The population used in this research comprised of all registered non-financial companies in the Indonesia Stock Exchange in 2014–2016. The sample was selected using a purposive sampling method to obtain 36 sample companies and analyzed through multiple regression analysis. Results show that the environmental performance variable, which is described by PROPER ratings and environmental management systems, and company size variable, both affect the extent of environmental disclosures. However, the financial performance variable, which is described by companies' profitability and leverage, and the number of board commissioner variable, both do not significantly affect the extent of environmental disclosures.

Additionally, Gavurova et al. (2018) utilized a non-radial Data Envelopment Analysis (DEA) approach to assess environmental assessment in OECD countries. The aim of the study is to analyze the condition and development of the OECD countries using a set of green growth indicators. The univariate and multivariate statistical approach was used to identify the main features of green growth development in two time spans. The achieved success of the OECD countries toward the green growth was measured from period 1 (years 2000–2009) to period 2 (years 2010–2019). For stimulant indicators, an increase was achieved, while for the de stimulant variables, a decrease was reached between the analyzed periods. CO2 productivity increased by more than 31%, material productivity by 25%, and the energy productivity by nearly 21%. From the ecological point of view, a positive sign was achieved by an intensive increase of the percentage of municipal waste treatment by recycling or composting. The real GDP increased between periods in each of the OECD countries, except in Greece. The de stimulant indicators decreased over time.

The mortality declined by about 20% from exposure to ambient PM2.5 and thus the welfare costs of premature death from exposure to PM2.5 also declined. The decline of the mean population exposure to PM2.5 by 12.5% on average for the OECD countries is a positive signal for environmental protection and public health of the OECD population. Some uncertainty exists as the municipal waste generated per capita decreased only slightly by 2%. Although this study is not specific to Nigeria, it provides insights into how environmental performance measurement in terms of social costs can be linked to financial outcomes. Firms with better environmental assessment tend to have improved financial metrics.

Enhancing the comprehension of this relationship Wang et al. (2020) dig deep into this given question: Does environmental information disclosure contribute to improve firm financial performance? Given the widespread impacts of firm activities on the environment, firms are increasingly required to disclose environmental information. However, the relation between environmental information disclosure and firm financial performance is controversial and the mechanism through which environmental information disclosure affects financial performance is insufficiently investigated. This research examined the effect of environmental assessment disclosure on financial performance and explored the mediating effects of visibility (e.g., analyst coverage and institutional ownership) and liquidity. Panel data from 289 Chinese listed firms were analyzed with the assistance of STATA Software. According to the results, practical implications were discussed and future research directions were noted.

Shahab et al. (2020) examined the impact of chief executive officer (CEO) attributes on sustainable performance, environmental assessment, and environmental reporting, which are motivated by institutionally driven environmental policies, regulations, and management in the context of Chinese listed firms. With the use of a comprehensive dataset of 2,854 Chinese listed firms over the 2010–2017 period (i.e., making over 16,000 individual firm-year observations), the findings are fourfold. The overall findings reveal that CEOs with research background tend to engage more in activities that improve sustainable performance, environmental assessment, and environmental reporting than do those without research background. The study interpreted the results within upper echelons theoretical perspective. The results are robust to alternative measures, potential endogeneities, and sample selection problems.

Chen and Xie (2022) discussed the effect of environmental, social, and governance (ESG) disclosure on corporate financial performance. This study uses a sample of non-financial listed companies from 2000 to 2020 and applies the staggered difference-in-differences technique to eliminate the endogeneity problem. Findings show that ESG disclosure has a favorable effect on corporate financial performance. The positive effect of ESG disclosure on corporate financial performance is more pronounced in companies with ESG investors and companies with longer inception, high media attention, and high agency costs. In addition, investors with ESG preferences exert a substantial moderating effect on the link between ESG disclosure and financial performance connection. We arrive at two conclusions in the extended analysis. One is that ESG disclosure attracts ESG investors. Another is that ESG investors also play a positive moderating role in the connection between ESG ratings and financial performance.

Previous research, including studies by Chen and Xie (2022), Gavurova et al. (2018), Shahab et al. (2020), and Wang et al. (2020), has shown a positive correlation between environmental assessment disclosure and financial performance across various regions, such as Indonesia, China, and the OECD (Organization for Economic Co-operation and Development) which consists of 38 member countries as of 2024 (Wang et al., 2020). However, there is a need for similar research focusing specifically on Nigeria. Additionally, existing literature, such as the works of Alsaifi et al. (2020), Chen and Xie (2022), and Shahab et al. (2020), emphasizes the advantages of environmental assessment disclosure in different sectors, but does not explore how these practices impact market performance within listed multinational firms in Nigerian context. This study aims to address these gaps by investigating how environmental assessment disclosure influences the financial performance of listed multinational firms in Nigeria. Therefore, the following hypothesis is proposed:

H_{02}: Environmental assessment disclosures do not have a significant effect on the financial performance of listed multinational firms in Nigeria.

Environmental Compliance and Financial Performance

The correlation between environmental compliance and financial performance examines how investing in environmental initiatives and adhering to regulatory standards impacts a company's profitability, operational efficiency, and overall market value.

Judi Janto et al. (2024) conducted a study on analysis of the Effect of Risk Management and Compliance Practices on Financial Performance and Corporate Reputation in the Financial Industry in Indonesia. This study examines the impact of risk management and compliance practices on the financial performance and

corporate reputation of financial institutions in Indonesia. Utilizing a quantitative approach, data were collected from 160 financial institutions through a structured questionnaire and analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS 3). The results indicate that both risk management and compliance practices significantly enhance financial performance and corporate reputation. Specifically, risk management practices have a stronger positive impact on both outcomes compared to compliance practices. These findings underscore the necessity for financial institutions to integrate comprehensive risk management and compliance strategies into their operations to achieve financial stability and bolster their reputation.

Also, Boakye et al. (2020) investigated sustainable environmental practices and financial performance: Evidence from listed small and medium-sized enterprise in the United Kingdom. It was discovered that existing literature indicates that there is a direct relationship between sustainable environmental practices and financial performance. However, studies looking at this relationship have focused mainly on large firms with little attention paid to SMEs. Further, those looking at environmental and financial performance relationships have often used a single measure of performance in their studies. This study bridges these research gaps by focusing on listed SMEs in the United Kingdom using multiple measures of sustainable environmental policy indices on a panel of 201 SMEs on the Alternative Investment Market from 2011 to 2016. Specifically, energy efficiency practices, greenhouse gases, material, and resource efficiency revealed an inverted U-shaped relationship with financial performance. The results will offer guidance to management in terms of allocating resources to sustainable environmental practices investment.

Baah et al. (2020) explored ways to protect and promote environmental sustainability having recently become critical to organizations survival due to pressures from diverse stakeholder groups. The aim of this study is to explore the effects of organizational stakeholder pressure and regulatory stakeholder pressure on green logistics practices and financial performance whiles investigating if environmental reputation and social reputation are missing links in mediating the relationships between organizational stakeholder pressure, regulatory stakeholder pressure, green logistics practices and financial performance. This research adopted partial least square structural equation modeling technique in analyzing the data due to it having more predictive power. The results show that pressures from organizational and regulatory stakeholders influence the adoption and implementation of green logistics practices, thereby enhancing environmental reputation, which also improves financial performance. The results specifically highlight that regulatory stakeholder pressures significantly influences social reputation, which also significantly influence financial performance.

He et al. (2020) studied the applicability of the Porter Hypothesis to Chinese manufacturing enterprises from a property rights perspective, we match the financial data of all A-share manufacturing companies listed in Shanghai and Shenzhen Stock Exchanges of China from 2008 to 2016 with the marketization index compiled by Wang et al. (2017), and test the empirical relationship between environmental regulation and corporate financial performance using a fixed effects model. We find that: First, the Porter hypothesis per se is not supported in China’s manufacturing sector, and environmental regulation often lowers manufacturing enterprises’ financial performance. Second, property rights protection has a positive impact on corporate financial performance, and a good property rights environment can mitigate the negative impact of environmental regulation on corporate financial performance by inducing corporate innovations. Third, property rights protection exhibits differential extent of its moderating effect on the relationship between environmental regulation and enterprise performance across different types of enterprises in terms of their ownership natures and the regional economic development level of their geographic locations. All of our main results survive several robustness checks that we performed.

Yusof et al. (2020) investigated the various environmental regulations to address the negative effect of construction activities on the environment, the construction sector is still slow to implement green practices (GPs). To encourage construction firms to implement GPs, these firms should be convinced that GPs are a financially viable endeavor. This paper aimed to analyses the influence of GPs on corporate financial performance (CFP) and investigate whether firm size influences that effect. A survey was employed to gather information from Malaysian construction firms, and the data were analyzed using partial least squares structural equation modelling. The findings indicate that green supplier management, green subcontractor management, and green project management have significant effects on CFP and that large firms with high

levels of green business practices and green project management attained higher CFP than small and medium enterprises. Policymakers and managers should take a flexible approach to boost GPs in the construction industry.

Li et al. (2023) also explored the moderating effects of local environmental regulation in the study effects of greenwashing on financial performance using a sample of 2816 observations covering 735 Chinese-listed firms in 21 different industries from 2013 to 2017, this research examines the effect of greenwashing on CFP and explores the moderating effects of local environmental regulation, media visibility and media favorability. Results show that greenwashing positively affects CFP and effect weakened with stringent environmental regulations and reversed with low media favorability. The finding implies that stakeholders could hardly identify greenwashing in the context of an emerging economy with high-level information asymmetry. However, local environmental regulation and negative media coverage could reduce this information asymmetry, making greenwashing easier to be identified. It is the first study to investigate greenwashing–CFP relationship from institutional environment perspective.

Further research by Börzel et al. (2020) investigated compliance with EU environmental law. The European Union (EU) has become the main driver for environmental policy output for its member states whose number has more than tripled over the past four decades. The EU's deepening and widening has led researchers to expect more non-compliance with EU environmental legislation. In fact, the implementation gap has narrowed over the past 25 years. Except for Southern enlargement, taking on new member states has not exacerbated the EU's compliance problem in the field of environmental policy. Nor has the expansion of the environmental acquis. This is explained by the European Commission's strategies of managing and enforcing compliance. EU environmental policy has become less demanding on member states since it increasingly tends to amend existing rather than set new legislation. Simultaneously, the Commission has developed new instruments to strengthen member state capacities to implement EU environmental legislation.

Li et al. (2021) studied a comprehensive index of environmental regulation and the degree of environmental co-governance at the enterprise level and uses a panel probit model, the two-stage least squares method, and an interaction regression model to assess the effect of environmental regulation and environmental co-governance on pollution transfer. The probability of enterprise migration increases as environmental regulation intensity increases, confirming the pollution transfer effect of environmental regulation. The analysis of the influencing mechanism shows that environmental regulation can reduce the probability of pollution transfer through the “innovation compensation effect” and improve the probability of enterprise migration through the “compliance cost effect”. In addition, under the condition of established environmental regulation, environmental co-governance can reduce the probability of enterprise migration, inhibit the transfer of pollution to nearby areas, and improve the efficiency of environmental governance. This study is conducive to assessing the policy effectiveness of environmental regulation and provides a reference for other countries regarding pollution transfer.

The study aims to address several research gaps identified in the existing literature. Firstly, while most research focused on various sectors across different regions and geographical areas, there is a noticeable absence of studies examining environmental compliance and financial performance specifically within multinational firms in Nigeria. Secondly, although there have been investigations into the relationship between environmental practices and financial performance, there is an absence of comprehensive analyses that specifically explore the disclosure of environmental compliance and its effect on profitability in listed multinational firms in Nigeria. Thirdly, there is a theoretical gap in the existing research, as most previous studies did not explicitly incorporate an underpinning theory. This study, however, utilizes both stakeholder theory and institutional theory to guide the research. Additionally, while some studies have explored the relationship between environmental practices and financial performance, there is a need for a more focused investigation into environmental risk management and compliance, particularly regarding their potential impact on financial performance in Nigeria. The hypothesis for this study is as follows:

H_{03}: Regulatory compliance does not have a significant effect on financial performance of listed multinational firms in Nigeria.

Conceptual Framework

Figure 2.1 shows the interactions between the independent variable Environmental Risk Management with its proxies' environmental conservation practices, risk assessment disclosure, and environmental compliance and the dependent variable Financial Performance with its proxy return on asset

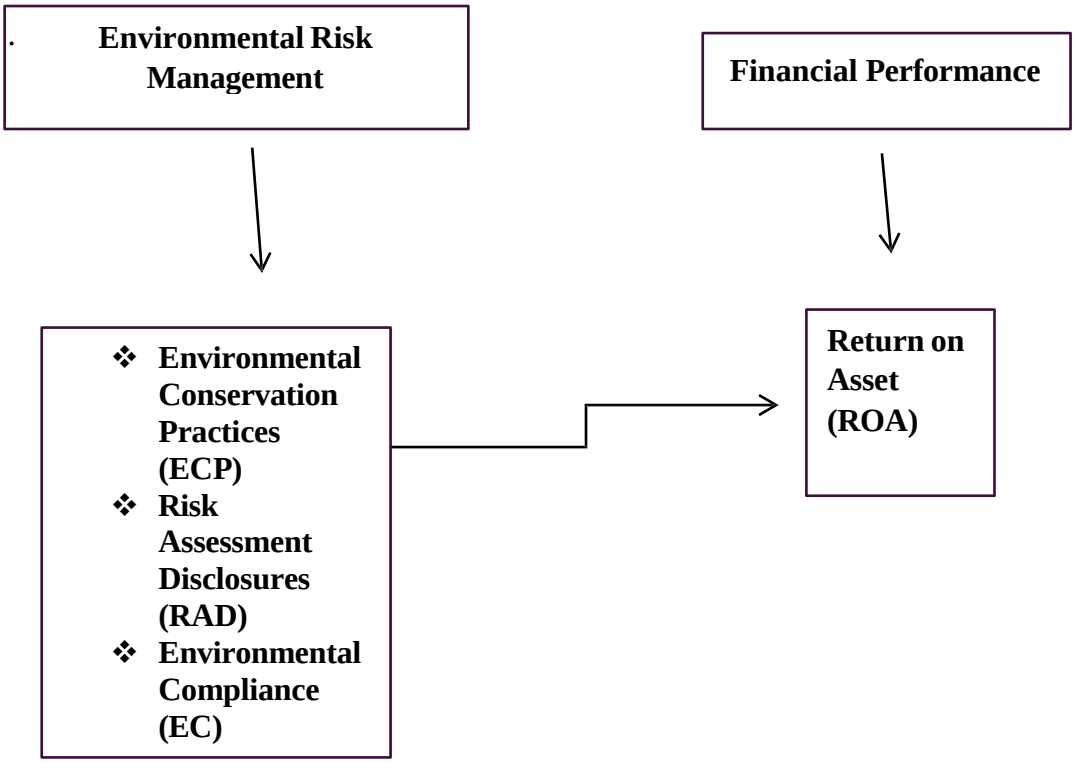

Figure 2.1: Conceptual Framework

Source: Researchers' Design (2024)

METHODOLOGY

This study utilized an ex-post facto research design, deemed appropriate as the researcher cannot alter or influence the sample data, which consists of historical information from a population group, specifically the listed multinational firms in Nigeria. Secondary data were collected from the published annual reports of the firms for a period of 12 years covering 2012 to 2023. This is considered appropriate because it allows the collection of sufficient data to observe long-term trends and performance patterns in the multinational firms in Nigeria. The study population comprises of 46 companies that are listed on the Nigeria Exchange (NGX) as at December 31, 2023. This population is considered appropriate because it includes all the multinational firms listed on the Nigeria Exchange (NGX), ensuring reliable data and a comprehensive representation of the sector's performance over the study period. The sample size includes all the 46 multinational firms listed on the NGX as at December 31, 2023.

Model Specification

The model is adapted in line with the study carried out by (Igbekoyi & Oluwajuyigbe, 2022) on sustainable labour practices and financial performance of listed premium board firms in Nigeria. This study digresses from their study based on the removal of some variables such has employee benefit, employee turnover, discrimination policy, and employee productivity and inclusion of some new variables like environmental conservative practices, risk assessment disclosure, environmental compliance. Thus, specified hereunder is the adapted study model:

FPit = f(SLPit)

FPit= f (EBit, ETit, NDit)

ROAit= a + β1EBit+ β2ETitt+ β3NDit+ eit----------i

ROAit*EP = a + β1EBit*EP+ β2ETit*EP+ β3NDit*EP+ εit----------ii

Where;

FP= Financial performance

SLP= Sustainable Labour Practices

ROA= Return on Assets

EB= Employee Benefit

ET= Employee Turnover

ND= Non-Discrimination Policy

EP = Employee Productivity

β= Coefficient of the explanatory variable (slope)

ε =Represents the error term in the model

it= 'i' in period t'

According to the study above, financial performance was measured by ROA, however, in this study financial performance is also proxied by ROA and is a function of environmental risk management and the following is the econometric description of this relationship:

ROA it = α0 + β1ECPit + β2RADit + β3ECit + Ɛit..... (i)

Where;

ROA = Return on Asset

ECP = Environmental Conservative Practices

RAD = Risk Assessment Disclosures

EC = Environmental Compliance

α = Constant Term

β = Coefficient Term

i = No of firms

t = Time Period

Ɛ = Error term

The a-priori expectation = β_1, β_2, β_3,> 0, this suggests that a positive correlation is anticipated between the explanatory variables and the dependent variable.

Measurement and Description of Variables

Table 1 shows the description, measurement, data source, and literature source of the investigated variables.

Table 1: Measurement and Description of Research Variables

Variable	Description	Measurement	Data Source	Literature Source
Return on Asset (ROA)	Return on Assets (ROA) is a financial metric that indicates how profitable a company is relative to its total assets.	It is calculated by net income divided by total assets.	Annual Reports	Uwalomwa & Omagbemi (2022), Panigrahi & Vachhani (2021)
Environmental Conservation Practices	These are strategies, actions, and policies implemented by organizations to protect and preserve the environment.	The attainment of certifications such as ISO 14001, which indicates compliance with environmental management standards.	Annual Reports	Bryson (2018), Gunningham & Sinclair (2019)
Risk Assessment Disclosures	Risk assessment disclosures involve the reporting of risks that a company identifies, evaluates, and manages in its operations.	Common metrics include risk exposure levels, sensitivity analyses, stress testing results, and key risk indicators (KRIs) that track the status and trends of various risks over time.	Enterprise Resource Planning (ERP) Systems	Guthrie et al. (2020)
Environmental Compliance	Refers to the adherence of organizations, particularly firms, to environmental laws, regulations, standards, and other requirements set by regulatory bodies.	Results from environmental audits, inspections, and certifications (e.g., ISO 14001).	Environmental Agencies	Aragón-Correa et al. (2020)

Source: Researchers' computation (2024)

Data Analysis Technique

This study will employ descriptive statistics (mean, median, variance, standard deviation, skewness, and kurtosis) and inferential statistics (panel regression analysis, correlational analysis etc.) to conduct data analysis.

DATA ANALYSIS AND DISCUSSION OF FINDINGS

This section describes the features of variables used, data analysis and study findings.

Descriptive Statistics

The descriptive statistics provide an overview of the central tendency and dispersion of the variables under study, offering insights into the data's distribution. For the dependent variable, return on assets (ROA), with a mean value of 4.487, the average financial performance, measured in return on assets, seems relatively low for

listed multinational firms in Nigeria over the 2012-2023 period. The standard deviation of 9.272 indicates significant variability in firm performance, suggesting that while some firms may have performed well, others have experienced considerable financial challenges. The negative minimum value of -52.560 reflects that some firms incurred substantial losses, whereas the maximum value of 68.300 suggests that the most profitable firms achieved a strong return on assets. This wide range highlights the diverse financial performance among the sampled firms. For environmental conservative practices (ECP), the mean value is 0.130, implying that on average, environmental conservative practices were adopted by approximately 13% of the firms. The standard deviation of 0.336 indicates variability in the extent to which these practices were embraced, though the minimum and maximum values of 0 and 1 show that while some firms did not adopt these practices at all, others fully incorporated them. This suggests a mixed commitment to environmental conservative practices among the firms.

Similarly, risk assessment disclosures (RAD) exhibit a mean of 0.259, indicating that on average, around 26% of the firms disclosed their risk assessment practices. The standard deviation of 0.439 further highlights the variability in this practice, with some firms fully engaging in risk disclosures (1) and others not disclosing at all (0). This suggests that while some firms recognize the importance of communicating their risk assessments, others may not prioritize this area in their reporting. For environmental compliance (EC), the mean value of 0.207 reflects that approximately 21% of the firms adhered to environmental compliance. The standard deviation of 0.406 points to considerable variation in the levels of compliance, and the minimum and maximum values of 0 and 1 indicate that, like with ECP and RAD, there is a significant disparity between firms that fully comply with environmental standards and those that do not. This suggests that a large portion of firms may need to improve their environmental compliance measures. Lastly, earnings per share (EPS), the control variable, shows a mean of 4.872, indicating that the average earnings per share were relatively modest. The high standard deviation of 12.928 points to significant volatility in firm earnings, which is consistent with the wide range from -11.660 to 136.820. This considerable variation in earnings per share suggests that while some firms performed exceptionally well, others faced financial difficulties, further underscoring the diverse financial landscape among the multinational firms included in the study.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Roa	324	4.487	9.272	-52.560	68.300
Ecp	324	0.130	0.336	0.000	1.000
Rad	324	0.259	0.439	0.000	1.000
Ec	324	0.207	0.406	0.000	1.000
Eps	324	4.872	12.928	-11.660	136.820

Source: Researcher's computation (2024)

Data Normality

From Table 3, the study finds that the dependent variable of return on assets (ROA) (prob>z = 0.000) is not normally distributed since the probability of the z-statistics, as revealed by the Shapiro-Wilk test, is significant at the 1% significance level. The same can be said for the independent variables of environmental conservative practices (ECP) (prob>z = 0.000), environmental compliance (EC) (prob>z = 0.000), and earnings per share (EPS) (prob>z = 0.000), all of which have significant probabilities at the 1% significance level, indicating non-normality in their distributions. The variable of risk assessment disclosures (RAD) (prob>z = 0.013) also shows a significant z-statistic at the 5% significance level, meaning it is not normally distributed. Given that the Shapiro-Wilk test reveals that all the variables under study, including both the dependent and independent variables, are not normally distributed, this justifies the use of non-parametric statistical methods for further analysis. Therefore, we would employ the Spearman Rank Correlation to examine the relationships between the variables under study, as it does not require the assumption of normality in the data.

Table 3: Shapiro-Wilk Test for Normal Data

Variable	Obs	W	V	z	Prob>z
roa	324	0.851	33.939	8.304	0.000
ecp	324	0.963	8.488	5.039	0.000
rad	324	0.989	2.589	2.241	0.013
ec	324	0.982	4.145	3.350	0.000
eps	324	0.459	123.478	11.347	0.000

Source: Researcher's computation (2024)

Test of Variables

In this section, the study presents the results of the correlation and regression analyses before conducting a test of the hypotheses.

Correlation Analysis Result

In the case of the correlation between environmental risk management variables and financial performance, the above results show that there exists a weak negative association between the independent variable of environmental conservative practices (ECP) (-0.064) and the dependent variable of return on assets (ROA) during the period under study. This suggests that as firms increase their environmental conservative practices, their ROA may tend to slightly decrease, although the relationship is weak. Additionally, the results show that there is a negative association between risk assessment disclosures (RAD) (-0.234) and ROA, indicating a stronger negative correlation compared to ECP, which suggests that higher disclosure of risk assessments is associated with lower firm performance in terms of ROA. Similarly, environmental compliance (EC) is negatively associated with ROA (-0.160), though this association is weaker than that of RAD but stronger than ECP, suggesting that firms adhering to environmental compliance standards might experience a slight decrease in ROA.

However, the correlation between earnings per share (EPS) and ROA (0.637) is positive and relatively strong, indicating that firms with higher earnings per share tend to have better financial performance, as measured by ROA, during the period under study. Regarding the interrelationships among the independent variables, there is a moderate positive correlation between ECP and RAD (0.254), suggesting that firms that engage in more environmental conservative practices also tend to disclose more information regarding their risk assessments.

Additionally, a strong positive association exists between ECP and EC (0.529), indicating that firms that implement environmental conservative practices are likely to comply with environmental regulations. However, the association between RAD and EC is weaker (0.202), suggesting a less pronounced relationship between these variables. There is also a weak positive association between EPS and both ECP (0.103) and RAD (0.092), though these relationships are not very strong, and a very weak negative association between EPS and EC (-0.014). The results indicate the absence of multicollinearity since the associations between the variables are generally weak or moderate. However, to confirm the absence of multicollinearity among the variables, a more robust check such as the Variance Inflation Factor (VIF) Test would be necessary, and the results of that will be presented in the next section.

Table 4: Spearman's Rank Correlation

variables	(1) roa	(2) ecp	(3) rad	(4) ec	(5) eps
(1) roa	1				
(2) ecp	-0.064	1			
(3) rad	-0.234	0.254	1		

(4) ec	-0.16	0.529	0.202	1	
(5) eps	0.637	0.103	0.092	-0.014	1

Source: Researcher's computation (2024)

Environmental risk management variables and financial performance

Table 5 represents the results obtained from the estimation of the models using the OLS regression method. The results indicate that the dependent variable, as captured by the regression model, has an R-Square value of 0.177. This suggests that the independent and control variables in the study account for approximately 17.7% of the systematic variation in the dependent variable during the period under study. The remaining 82.3% of the variation is explained by other factors not included in the model, as indicated by the error term. The significance of the OLS model is further supported by the highly significant p-values associated with some variables, particularly the control variable earnings per share (EPS), which is significant at the 1% level ($p<0.000$). This underscores the relevance of the model in explaining the dependent variable. However, to further validate the estimates of the OLS results, this study also tests for multicollinearity and heteroscedasticity.

Table 5: Regression Results

	(1)	**(2)**	**(3)**	**(4)**
Variables	OLS	FE	RE	LSDV
Ecp	-0.317	-0.797	-0.656	-0.797
	(0.852)	(0.663)	(0.706)	(0.663)
Rad	-2.566**	-4.564**	-3.145**	-4.564**
	(0.023)	(0.020)	(0.031)	(0.020)
Ec	-1.479	-3.370**	-2.422	-3.370**
	(0.282)	(0.039)	(0.102)	(0.039)
Eps	0.274***	0.291***	0.280***	0.291***
	(0.000)	(0.000)	(0.000)	(0.000)
Intercept	4.162***	5.055***	4.526***	9.202***
	(0.000)	(0.000)	(0.000)	(0.006)
Observations	324.000	324.000	324.000	324.000
R^2	0.177	0.117		0.348
Adj R^2	0.166	0.027		0.281
F-stat	17.099	9.744		5.212
Year Dummy	No	No	No	Yes
Hettest	13.61{0.000}			
FE/RE		2.96{0.000}	28.47{0.000}	
VIF	1.26			
Hausman		33.29{0.000}		

Notes: p-values are in parentheses. *** p<.01, ** p<.05

Source: Researcher's computation (2024)

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Diagnostic Test

The test for multicollinearity using the Variance Inflation Factor (VIF) yields a mean VIF of 1.26, which is well below the threshold of 10, aligning with Gujarati's (2004) guideline.

Variable	VIF	1/VIF
ecp	1.48	0.675966
ec	1.40	0.714887
rad	1.10	0.906948
eps	1.05	0.951476
Mean VIF	1.26	

This suggests that multicollinearity is not a concern in this model, and none of the independent variables need to be excluded due to multicollinearity issues. The Breusch-Pagan test for heteroscedasticity reveals a chi-square statistic of 13.61 with a p-value of 0.000, indicating that the assumption of homoscedasticity has been violated.

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of roa

        chi2(1)      =    13.61
        Prob > chi2  =   0.0000
```

Due to the presence of heteroscedasticity, the study needs to adjust the model to produce reliable standard errors and valid statistical inferences. This necessitates employing panel fixed and random effect regression techniques to control the violation of homoscedasticity, as recommended by Wooldridge (2010). As noted by Ajibola and Sankay (2013), the fixed-effects model, often the primary technique for analyzing panel data, is used when it is essential to control for omitted variables that differ between cases but remain constant over time. This model leverages the changes in the variables over time to estimate the effects of the independent variables on the dependent variable. Conversely, the random-effects model is employed when some omitted variables are assumed to be constant over time but vary between cases, while others are fixed between cases but vary over time. In light of this, the present study employs both panel fixed and random effect regression to control for the heterogeneity effect present in the pooled OLS regression models.

The Hausman specification test shows a chi-square statistic of 33.29 with a p-value of 0.000, which is significant at the 1% level. This result suggests that the fixed effects (FE) model is preferred over the random effects (RE) model for this study. The Hausman test confirms that the fixed effects model is more appropriate due to the presence of unobserved heterogeneity that correlates with the explanatory variables. The results from the panel fixed effect regression, as presented in Table 5, show an F-statistic value of 9.744, with a probability value of 0.000, indicating that the fixed effect regression model is statistically significant at the 1% level, and is suitable for statistical inference. Additionally, the fixed effect regression has an R-squared value of 0.117, implying that the independent variables of the study explain approximately 11.7% of the systematic changes in the dependent variable during the period under review. However, the result indicates the presence of fixed effect {2.96 (0.000)}. Specifically, the fixed effect in itself is a problem due to the present of unobserved variances in the cross-section that is present over time. Hence, the study employed the Least Square Dummy Variable (LSDV) regression to control the unobserved variances across time. The LSDV model shows an R-squared value of 0.348, indicating that approximately 34.8% of the systematic variation in the dependent variable is explained by the independent variables when considering time effects. The adjusted R-squared value of 0.281 supports the robustness of the LSDV model in capturing the variations across time, further validating the choice of this model for policy recommendations and interpretation.

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DISCUSSION OF FINDINGS

The finding that environmental conservative practices have an insignificant negative effect on the return on assets (ROA) for listed multinational firms in Nigeria suggests that adopting such practices does not play a critical role in enhancing financial performance. This outcome contrasts with the assumption that environmental conservation efforts lead to operational efficiency and cost savings. It implies that, at least in this context, firms may not experience immediate financial gains from implementing environmentally conservative strategies, perhaps due to the high upfront costs or long-term nature of the benefits. Pham et al. (2021) observed similar findings in their research, where environmental initiatives did not significantly influence firm performance in the short run. In contrast, Boakye et al. (2020) found a positive impact of environmental practices on firm value, suggesting that these practices might yield benefits in sectors or regions where consumer pressure for sustainability is higher. Jin et al. (2021), in their analysis, also supported the idea that environmental strategies are more likely to benefit firms in regions with stringent regulatory frameworks, which might not be as strictly enforced in Nigeria, thus explaining the neutral effect observed in this study. Kiarie and Kimunguyi (2018) echoed the view that, without a robust policy environment, the financial benefits of such practices remain elusive, supporting the findings of the current study.

The significant negative effect of risk assessment disclosures on financial performance, as revealed by this study, points to a complex relationship between transparency and profitability. In the context of listed multinational firms in Nigeria, this result implies that firms investing more in risk disclosures may experience financial strain, possibly due to the associated costs or the perception of heightened risk by stakeholders. Wang et al. (2020) support this notion, suggesting that excessive disclosures might signal underlying vulnerabilities, thus lowering investor confidence and firm performance. This aligns with the findings of Gavurova et al. (2018), who argue that, in emerging markets, detailed disclosures might create a negative sentiment by highlighting risks rather than reassuring stakeholders. On the other hand, Alafia et al. (2020) found a positive correlation between transparency in risk disclosures and firm performance, particularly in more developed markets where investors value risk management. Chen and Xie (2022) observed that the context and the nature of the risks disclosed play a critical role in how these disclosures affect performance, with firms disclosing less severe risks generally experiencing more positive outcomes. Shahab et al. (2020), while examining the impact of risk disclosures, argued that the quality and framing of these disclosures are essential in mitigating any negative effects on performance, indicating that Nigerian firms may need to refine their risk communication strategies to avoid financial drawbacks.

The finding that environmental compliance significantly negatively affects return on assets suggests that adherence to environmental regulations may impose considerable financial burdens on multinational firms in Nigeria. This outcome aligns with the argument that compliance, particularly in regions with less robust enforcement, can become a costly obligation without immediate financial benefits. Yusof et al. (2020) noted a similar pattern in their study, where compliance costs outweighed the benefits, especially in markets with weaker regulatory incentives. He et al. (2020) also found that firms in developing economies often bear the brunt of compliance costs without experiencing significant financial rewards, as these regulations might not align with immediate market demands.

In contrast, Li et al. (2023) observed a positive effect of environmental compliance in industries where consumers highly value sustainability, indicating that compliance can be financially rewarding in specific sectors or regions. Boakye et al. (2020) highlighted the long-term benefits of compliance in improving firm reputation and access to capital, suggesting that the negative financial impact may be temporary. However, Judijanto et al. (2024) argued that in environments like Nigeria, where environmental enforcement may be inconsistent, firms that comply more rigorously might face higher costs than those that take a less stringent approach, explaining the significant negative relationship found in this study. Baah et al. (2020), in a related discussion, emphasized that for compliance to be financially beneficial, there must be external pressure from either regulators or stakeholders, a condition that might be weak in the Nigerian context.

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CONCLUSION AND RECOMMENDATIONS

This study addressed the unclear impact of environmental risk management practices on the financial performance of listed multinational firms in Nigeria. The study aimed to explore how specific environmental management strategies namely, environmental conservative practices (ECP), risk assessment disclosures (RAD), and environmental compliance (EC) influence financial performance, measured in terms of return on assets (ROA). This inquiry was essential given the increasing global emphasis on sustainability and environmental responsibility, particularly for multinational corporations. The key findings of the study revealed that while environmental conservative practices had an insignificant negative impact on financial performance, both risk assessment disclosures and environmental compliance had significant negative effects on ROA. These results suggest that, in the context of Nigerian multinational firms, environmental management efforts may pose financial challenges rather than benefits, at least in the short term.

The key takeaways from the study indicate that while environmental risk management is becoming increasingly important, its financial implications for multinational firms operating in Nigeria are not straightforward. The insignificant effect of environmental conservative practices suggests that firms are not reaping immediate financial rewards from such strategies, potentially due to the costs involved. On the other hand, the significant negative impact of risk assessment disclosures and environmental compliance on firm performance underscores the financial burden these practices may place on firms, which may deter broader adoption unless aligned with a more supportive regulatory environment or market expectations. Overall, the findings raise important questions about how multinational firms in Nigeria can balance environmental obligations with financial performance.

In light of the findings, the study recommends that corporate managers and directors should reassess the financial implications of their environmental risk management strategies. Specifically, while embracing environmental conservative practices, they should identify cost-effective measures that align with long-term financial objectives. Policymakers and regulators need to create frameworks that provide incentives for environmental compliance, making such practices more financially viable for firms. For analysts and investors, both potential and existing, the study suggests that they carefully evaluate the extent of a firm’s environmental commitments and disclosures, as these could impact financial performance negatively in the short term.

For environmental conservative practices (ECP), corporate managers should adopt incremental and scalable environmental initiatives that provide tangible financial benefits over time. Policy makers could introduce more incentives, such as tax breaks or subsidies, to support firms implementing environmental conservation strategies. Analysts and investors should monitor the long-term implications of these practices, as their financial effects may not be immediately apparent but could improve reputation and sustainability in the future.

In terms of risk assessment disclosures (RAD), corporate directors should focus on balancing transparency with the financial costs associated with such disclosures. More nuanced risk communication that does not unnecessarily raise concerns could help mitigate the negative financial impact. Regulators should provide guidelines on risk reporting that support firms while ensuring adequate risk disclosure without creating undue financial strain. Investors may need to weigh the depth of risk disclosures against the financial health of firms, understanding that excessive disclosure may indicate underlying challenges.

For environmental compliance (EC), managers should explore cost-reducing strategies that ensure compliance without overburdening the firm financially. Policy makers need to strengthen enforcement mechanisms while simultaneously offering financial incentives for compliance. Investors should be wary of firms with significant compliance costs, understanding that these might hinder short-term performance but could offer long-term stability. Analysts should assess the firm's compliance strategies and consider whether the potential reputational and regulatory benefits outweigh the immediate financial costs.

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