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- V. Literature Review
- VI. Methodology
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## TABLE OF CONTENT

1. <b>Effect of Firm Characteristics on Firm Value of Listed Deposit Money Banks in Sub-saharan Africa</b> .....	1
Mabur Zungbung Danladi, Deshi Nentawe Nengak, Maren Maram Isah and Dahel Innocent Felix	
2. <b>Effect of Forensic Interviews And Fund Tracing Techniques on Fraud Control in Public Sector Pension Administration in Kebbi State, Nigeria</b> .....	17
Ahmed Yarima Dakingari, Attahiru Ibrahim Alkali and Zainab Attahiru Alkali	
3. <b>Audit Quality as a Moderator Between Board Characteristics and Earnings Management: Evidence From Listed Banks in Nigeria</b> .....	25
Sabiu Ishaka Alfa, Lawal Faith Chidinma and Musa Adeiza Farouk	
4. <b>Effect of Non-current Assets on Value of Listed Consumer Goods Firms in Nigeria</b> .....	37
Mabur Zungbung Danladi, Deshi Nentawe Nengak, Maren Maram Isah and Dahel Innocent Felix	
5. <b>Effect of Forensic Accounting Techniques on Fraud Prevention In Ministries, Departments And Agencies (MDAs) in Plateau State</b> .....	51
Ondeku Felix Godwin, Adebisi Joseph Femi and Farouk Musa Adeiza	
6. <b>Effect of Forensic Interviews And Fund Tracing Techniques on Fraud Control in Public Sector Pension Administration in Kebbi State, Nigeria</b> .....	62
Ahmed Yarima Dakingari, Attahiru Ibrahim Alkali, Zainab Attahiru Alkali and Balkisu Ahmad Maiahu	
7. <b>Effect of Auditor Skills on Financial Accountability of Plateau State Government Ministries</b> .....	71
Umar Aishatu Adam	
8. <b>Effect of Ownership Structure on Environmental Disclosures of Listed Oil And Gas Companies in Nigeria</b> .....	80
Deshi Nentawe Nengak and Manji Eugene Nenkanma Helen	
9. <b>Moderating Effect of Audit Quality on Board Characteristics And Earnings Management of Listed Insurance Firms in Nigeria</b> .....	94
Sabiu Ishaka Alfa, Joseph Femi Adebisi, Musa Adeiza Farouk and Audu K. Buba	
10. <b>Effect of Board Characteristics on Cash Holding of Listed Commercial Banks in Nigeria</b> .....	105
Cycle Florence Kemebinkedoumene	
11. <b>Effect of Accounting Information Systems on Financial Reporting Quality of Listed Deposit Money Banks in Nigeria</b> .....	115
Adewole Adefemi Kazeem, Tamunonimim Ngerebo and Innocent Chinedu Enekwé	
12. <b>Effect of Corporate Governance Attributes and Value of Listed Insurance Companies in Nigeria</b> .....	126
Ahmed Tijjani Haruna	
13. <b>Effect of Forensic Accounting Tools on Fraud Prosecution Process in Nigeria Court System</b> .....	138
Blessing Chinelo Chukwu	

## TABLE OF CONTENT

14. <b>Effect of Sustainability Reporting on Share Price of Listed Oil and Gas Firms in Nigeria</b> .....	148
Clement Osemwengie Ekhoe-ugiagbe and Ojeifo Sidney Imevbore	
15. <b>Moderating Effect of Information Communication Technology Software on The Relationship Between Ownership Structure and Value of Listed Financial Firms in Nigeria</b> .....	160
Ejike Emeka Okongwu, Benjamin Uyagu and Farouk Musa Adeiza	
16. <b>Effect of Government Integrated Financial Management Information System Implementation on Financial Governance in Selected Ministries, Departments, and Agencies in Nigeria</b> .....	176
Emmanuel Monday Essien	
17. <b>Effect of Accounting Practices on Budget Implementation of Government-owned Research Institutes in South Eastern Nigeria</b> .....	194
Dennis Nnenna Okoro	
18. <b>Moderating Effect of Internal Audit Quality on The Relationship Between Accounting Information Systems and Financial Reporting Quality of Listed Deposit Money Banks in Nigeria</b> .....	205
Adewole Adefemi Kazeem, Tamunonimim Ngerebo and Innocent Chinedu Enekwé	
19. <b>Effect of Board Audit Committee Attributes on Assets Fraud Detection among Listed Manufacturing Companies in Nigeria</b> .....	215
Agboide Sunday Theophilus	
20. <b>An Empirical Analysis of The Relationship Between Government Transfer Payments and Economic Growth in Nigeria</b> .....	224
Inuwa Auwalu, Uyagu David Benjamin and Ganiyu A. Mustapha	
21. <b>Effect of Budget Processes on Performance of Public Funds in Plateau State Ministries, Departments and Agencies</b> .....	234
Yaks Mary Benjamin	
22. <b>The Effect of Cyber Fraud on Customer Trust in Nigerian Deposit Money Banks: A Digital Forensic Perspective</b> .....	250
Nkwonta Ifeoma Nnenna, Musa Adeiza Farouk and Benjamin Uyagu David	
23. <b>Effect of Forensic Audit on Fraud Detection in The Federal Ministry of Finance and Associate Agencies in Nigeria</b> .....	258
Musa Inuwa Fodio, Benjamin Uyagu David and Sani Chida Baba	
24. <b>Dividend Policy Determinants: Likelihood and Payout Magnitude in Nigeria's Consumer Goods Firms</b> .....	269
Ovbe Simon Akpadaka	
25. <b>Effect of Monetary Policy Instruments on Capital Adequacy of Listed Deposit Money Banks in Nigeria</b> .....	284
Jadesola Regina Adekalu, Joseph Femi Adebisi, Mbatuegwu David Christopher and Samuel Olutokunbo Adekalu	

## TABLE OF CONTENT

26. <b>Effect of Economic, Social and Governance Disclosures on Firm Value And The Moderating Effect of Leverage. A Study of Listed Non-financial Firms in Nigeria</b> .....	293
Aishat Oyiza Otori	
27. <b>Monetary Policy, Bank Size, and Capital Adequacy: A Conceptual Framework For Financial Stability in Nigeria</b> .....	301
Jadesola Regina Adekalu, Joseph Femi Adebisi, Mbatuegwu David Christopher and Samuel Olutokunbo Adekalu	
28. <b>Impact of Money Laundering Activities on The Operational Performance of Listed Commercial Banks in Nigeria</b> .....	312
Inuwa Auwalu and Ganiyu A. Mustapha	
29. <b>Effect of Computerized Forensic Investigation Techniques on Fraud Management in Lagos State Ministries, Departments and Agencies ...</b>	320
Kotun Rasheetdat Bunmi, Sunday Mlanga and Halidu Saidu	
30. <b>Moderating Effect of Bank Size on The Relationship Between Monetary Policy and Capital Adequacy of Listed Deposit Money Banks in Nigeria</b> ....	336
Jadesola Regina Adekalu, Joseph Femi Adebisi, Mbatuegwu David Christopher and Samuel Olutokunbo Adekalu	
31. <b>Legislative and Audit Oversight Institutions as Determinants of Budget Transparency in Sub-saharan Africa</b> .....	350
Emmanuel Sani	
32. <b>Do Sustainability Disclosures Matter For Market Valuation? Evidence From Consumer Goods Firms in Sub-saharan Africa</b> .....	358
Oloruntoba Adebayo Femi, Dagwon Yohanna Dang and Joseph Femi Adebisi	
33. <b>Effect of Monetary Policy on Manufacturing Outputs in Nigeria: 1980-2024</b> .....	368
S.A.S Aruwa, Benjamin Uyagu and Egbo Roseline Oruaroghene	
34. <b>Determinants of Public Participation in Public Budgeting among Sub-saharan Countries: The Influence Of Transparency and Oversight Institutions</b> .....	382
Emmanuel Sani	
35. <b>Effect of Earnings Management on Value Relevance of Listed Industrial Goods Firms In Nigeria.</b> .....	391
Callista Thomas Tenku and Tamunonimim A Ngereboa	
36. <b>Effect of Specific Attributes on Shareholders' Wealth of Listed Manufacturing Companies In Nigeria</b> .....	400
Ayobami Akofe Samotu and Musa Adeiza Farouk	
37. <b>Effect of Specific Attributes on Shareholders' Wealth of Listed Manufacturing Companies In Nigeria</b> .....	400
Ayobami Akofe Samotu and Musa Adeiza Farouk	

## EFFECT OF EMISSION MANAGEMENT PRACTICES ON THE VALUE OF LISTED OIL AND GAS COMPANIES IN NIGERIA

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### ABSTRACT

*This study aim to examine the effect of Emission Management Practices on Value of Listed Oil and Gas Companies in Nigeria from 2019 to 2024. The oil and gas company has been a cornerstone of global energy production for over a century, providing the fuel that powers modern world. Firm value of oil and gas companies in the world is significantly influenced by market capitalization, which reflects their financial strength and market dominance. This research will explore the key challenges facing the oil and gas exploration and production, the opportunities for innovation, growth, and the solutions that can help navigate this complex landscape. The oil and gas industry contributes significantly to the world, African and Nigeria's economy, accounting for approximately 90% of export earnings and 70% of revenue. The activities of oil and gas companies involve extraction, exploration, production, transportation, marketing among others. In Nigeria, there are 9 listed oil and gas companies listed in the Nigerian Exchange Group (NGX Group) as at 31 December 2024, research will be narrow to 6 listed oil and gas companies that have spent 15 years and above with the Group they are; Nigerian National Petroleum Corporation Limited (NNPCL), Total Energies plc, Oando plc, Capital Oil plc, Conoil plc and MRS Oil Petroleum. The dependent variable in this study is the firm value while the independent variable is the emission management practices. The need for continues use of modern technological equipment by oil companies to regularly verify emission management practices, periodic review of laws, policies, and regulations that can control fossil fuels. NNPCL to further increase renewable energy capacity, improving energy efficiency and, enhance waste management systems to mitigate the control of emission into the environment.*

**Keywords:** *Emission management, earnings and revenue generation, firm value, and review of regulations.*

### 1. Introduction

The firm value of oil and gas companies in the world is significantly influenced by market capitalization, which reflects their financial strength and market dominance. Studied by Makori, D. & Jagongo, A. (2023) who conducted a research on environmental accounting and firm profitability on Gujarat oil and gas company in India proved that green accounting disclosure has a significant effect on the market value and capitalization. In Africa it is influenced by organizational structure, research and development, environmental investment, sustainability reporting practices among others.

The management of emissions in the oil and gas industry has increasingly attracted global attention, emerging as a critical concern for both national governments and responsible corporate entities. Since the 1980s, it has occupied a prominent place on the

agenda of policymakers and business leaders alike, driven by a variety of internal and external factors, these impacts led to higher fossil fuel by-products in the air (Appiah, Du, Yeboah & Appiah, 2019; Sadorsky, 2014). A lot of government enactments, laws and regulations on emission management practices have been made by several nations in the world. United States of America, Canada, Norway, United Kingdom and the Netherlands have led in the pursuit of emission management practices and the need for environmental safety Okafor, et.al, (2023).

African nations like Nigeria, Algeria, Egypt, South Africa, Libya, Ghana, Tunisia have led in championing policies to address the need for emission management practices and value of oil and gas companies. Nigeria as the African leading oil producing nation have also contributed significantly to the management of emission in the sector. In the

light of the awakening to environmental protection, various laws and regulations such as the Environmental Impact Assessment Act, (EIA) 2021 and the Petroleum Industry Act (PIA) of 2021 has significantly contributed to the Nigerian oil and gas industry by establishing a legal and regulatory framework for the industry.

The oil and gas industry contributes significantly to Nigeria's economy, accounting for approximately 90% of the country's export earnings and 70% of its revenue. The industry's operations are also a major source of Renewable Energy and Greenhouse Gas (GHG) emissions, contributing to climate change and environmental degradation. The value of listed oil and gas companies in Nigeria is influenced by various factors, such as financial performance, operational efficiency, regulatory compliance, and environmental sustainability to mention a few. Effective emission management practices can enhance the value of these companies by reducing regulatory risks, improving reputation, and increasing investor confidence. Nigeria's oil and gas industries are characterized by a complex regulatory environment, limited institutional capacity, and inadequate infrastructure. The industry's emission management practices are influenced by these factors, as well as global trends.

Emission management practices in oil and gas industries assist in the protection of sea lives and lives above sea level such as human, aquatic, and terrestrial animals, others are poverty eradication, tackling inequalities and building strong institutions between the environmentalist and business owners. Organizations are more concerned with a modern operation that has been recognized as development that satisfies the demands of the present generation, without compromising the needs of future generations. Oil companies can strive to achieve these objectives by implementing a triple bottom line which includes economic, social, and environmental responsibilities in their mission statement. Currently, corporate survival depends on the level at which organizations participate in sustainability aspects into their strategies Cho & Patten, 2007. Integrating sustainability issues in the industry's strategy will assist organizations in waste and emission reduction, energy efficiency as well as conservation amongst others. Organizations that outshine in sustainability implementation and disclosure are not only doing it to gain societal acceptance, but it is also a business strategy that produces enormous returns on investment (Nasiru, et al, 2020).

The activities of oil and gas companies involve many interactions with local communities during extraction, exploration, production, transportation, and marketing. This has resulted in demand on oil companies to invest in the development of their local communities. The rise of digital technologies is transforming public policy through electronic

governance and digital service delivery. Governments are increasingly adopting digital platforms to enhance transparency efficiency, and citizen engagement. Electronic governance initiatives include online service portals, digital identification systems, and data-driven policymaking, which aim to streamline public administration and improve service delivery Prof AP Sharna et. al who conducted a research on public governance and policy in the oil and gas sector.

This call for the involvement of government and other regulatory bodies like the NNPC to continue monitoring the performance of oil and gas companies in Nigeria as the holding company of oil and gas marketers. The demand for a stable environment and minimization of cost especially the operation of the oil and gas sub-sector in Abuja had necessitated firms to address the menace brought to the stakeholders and society (Jimoh & Paul, 2021). The oil and gas sub-sector in Abuja had been criticized by many consumers of the products regarding its failure to render adequate services, high cost of products as well as hooding of the products by some marketers for selfish reasons. To this end, many of the filling stations are mostly locked or provide skeleton services to customers citing lack of products. (Uwaoma & Ordu, 2023).

## 1.2 Statement of the Problem

The increasing awareness of climate change and environmental degradation has led to growing concerns about the challenges of oil and gas operations on the environment, potentially affecting the value of listed oil and gas companies. Ineffective emission management practices in the oil and gas industry have led to reputational damage, regulatory penalties, and decreased investor confidence, ultimately affecting the market value of oil and gas companies. The industry's heavy reliance on fossil fuels and limited adoption of renewable energy sources that hinder its ability to mitigate climate change risks, potentially impacting the long-term sustainability and value of listed companies.

Despite the importance of environmental considerations in the oil and gas industry, there is insufficient empirical evidence on the effect of emission management practices which this study tends to explore. The current regulatory framework governing emission management practices in the oil and gas industry may be inadequate in line with global best practices, leading to inconsistent and ineffective emission reduction strategies that negatively affect the value of oil companies. The increasing pressure from stakeholders, investors, regulators and customers for improved environmental performance and disclosure creates a challenge for oil and gas companies to balance their financial report. Other areas to focus exclusively on this research would include; water

management, biodiversity, and land use. Additionally, the need for theoretical frameworks that can explain the relationship between emission management practices and firm value in the context of oil and gas sub-sector will be cautiously addressed.

### 1.3 Research Questions

In the course of this study, research questions are formulated:

- To what extent does emission reduction strategies influence the performance of listed oil and gas companies?
- How does emission management strategies affect the value of listed oil and gas companies?
- What is the effect of emission disclosure transparency on the value of listed oil and gas companies?
- How does the relationship between Corporate Social Responsibility (CSR), environmental initiatives and value influence listed oil and gas companies?

### 1.5 Statement of Hypotheses

The following null hypotheses have been formulated in this study:

- H<sub>01</sub>:** There is no significant relationship between emission reduction strategies and performance of listed oil and gas companies.
- H<sub>02</sub>:** Emission management strategies has no significant effect on the value of listed oil and gas companies.
- H<sub>03</sub>:** The effect of emission disclosure and transparency has no significant effect on the value of listed oil and gas companies.
- H<sub>04</sub>:** There is no significant relationship between CSR and value of listed oil and gas companies.

### 1.6 Significance to the Study

Government, the study will offer insight to policy makers and key players in the field of oil and gas sectors, showing how various sub-sectors associated with oil trading can influence Nigeria's economy. It will elucidate the nature of the correlation between these sub-sectors and the effect on Gross Domestic Product (GDP), the study will further prompt policy formulations and implementation strategies on the effects of emission management practices in the field of oil and gas industry as well as promote long-term economic growth. Consumers will facilitate all movement and economic activity in that area, thereby acting as a quick stop store for routine purchases such as the Premium Motor Spirit (PMS) for personal car users, Automotive Gas Oil (AGO) for medium and heavy trucks users, Dual Purpose Kerosene (DPK) for domestic purposes; (lamps, stoves, cookers among others), Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG), Aviation Turbine Kerosene

(ATK) for aircrafts and House Hold Kerosene (HHK) for domestic use.

## 2.0 LITERATURE REVIEW

### 2.1 Conceptual Review

Conceptual dimension and empirical evidence adopted by preceding scholars on effect of emission management practices on the value of listed oil and gas companies. Broad examination has been directed in scholarly community to research the connection between ecological execution and financial performance (Alsaifi et al., 2020). Despite the fact that reviews have had clashing outcomes, most investigations have tracked down a positive connection between natural divulgence and financial performance. High company value reflects a higher market price where the investor trust that the company have higher performance and quality prospects (Agbata, Nnubia, and Okaro, 2023). Myers & Well 2016, who conducted research on carbon emissions and firm performance; elaborated that emission management practices can significantly influence company's environmental performance by reducing GHG emissions, enhancing its image, potentially increasing market share among environmentally conscious consumers and leading to cost savings through energy efficiency improvements.

Emission management practices measured by decreased air pollution, reducing harmful substances released into the atmosphere, reduces GHG emissions, hydrocarbon, thereby benefiting planet and its inhabitants (Hassan & Romilly, 2023).

Emission disclosure index provides a clear picture of the company's Carbon Dioxide (CD), it is part of sustainable accounting, which aims to provide managers with information to assist companies in making short, medium, and long-term decisions about carbon emissions in a world where business is strongly linked to the related environmental crisis (IPPC 2007; Maunders & Burritt, 1991). The goals of CD emission management practices are to assist regulatory authorities in formulating a climate change strategy; identify and manage the risks and opportunities associated with climate change; product design, carbon management system development; achieve carbon reduction targets (Tang and Luo, 2014).

The literature on leverage measurement and its interaction with disclosure practices is broad and encompasses various companies and sectors. For instance, Taliyang et al. (2011) conducted a study in Malaysia, investigating the relationship between Intellectual Capital and Leverage across some sub-sectors, where leverage was assessed as the ratio of total liabilities to total assets. Agboola et al. (2012) explored Internet Financial Reporting in Nigeria,

treating leverage as a crucial independent variable measured by total debt/total assets, revealing how financial leverage affects firms' inclination towards online reporting. Zhang (2012) examined Intellectual Capital, using leverage as an independent variable measured by the ratio of total debt to total assets, while Nurudeen et al.

Similarly, Saeedi et al. (2020) studied the impact of Leverage on general disclosure practices, calculating leverage as the ratio of total debts to total assets, while Ayinla (2020) investigated Intellectual Capital with leverage defined as the ratio of total liabilities to total assets, furthermore, he explored how financial structure influences intellectual capital reporting in non-financial companies, measuring leverage as the ratio of total debts to total assets. Eneh et al. (2021) researched intangible assets disclosure in Nigeria, incorporating leverage as an independent variable measured by total debt/total assets. Furthermore, firm age is considered the chronological age of a firm, starting from its foundation, which impacts its resource allocation, strategic decision-making and adaptability (Zhang et al. 2019). Firms of different ages face distinct regulatory and policy challenges that shape their disclosure practices. For instance, young firms might disclose more about their use of disruptive technologies and digital platforms, while older firms might focus on legacy system modernization and compliance with evolving technological regulations.

## 2.2 Empirical Studies Review

This section reviews research on carbon practices and organizational performance at national and global level. These are briefly summarized below as follows: Ganda & Milondzo (2018) investigated the impact of CD emissions on the financial performance of South African companies. In 2015 financial year, 63 South African CDP companies were included in the sample, financial performance measures included ROE, Return on Investment (ROI) and Revenue Online Services (ROS); CD emissions included scope 1, 2 and scope 1 and 2 respectively. The study used multiple regression technique and statistical package for social sciences to analyze the data. The results showed a negative relationship between ROE and ROI with carbon intensity (range 1), ROS was positive for clean industry (ROI and ROS were negative but not significant; while ROE was positive for dull industry); positive non-significant relationship for ROE and ROI, but negative with carbon intensity for ROS (Scope 2) (ROE, ROI and ROS were negative but not significant for dull industries); Negative non-significant relationship of ROE, ROI and ROS with carbon emission intensity (scope 1 and 2) (ROE, ROI and ROS were negative but not significant for dull industries). based on this, it is opined that in emission management practices, companies that prioritize emission and value disclosure tend to perform better

financially. More so, transparency is key in environmental disclosure which can reduce firm risk and improve financial performance. The effective emission management and environmental practices can contribute to long-term financial performance. Finally, companies in the sub-sector should prioritize emission management practices and environmental disclosure to improve their financial performance and value.

Liu, Zhou, Yang, & Hoepner (2016) examine the relationship between corporate carbon emissions and United Kingdom (UK) financial report. The sample included 35 Financial Times Stock Exchange (FTSE) 40 companies between 2010 and 2021. Data were analysed using mediational path analysis and structural equation modelling. The results showed that carbon dioxide emissions are negatively related to financial performance; However, it is positively related to the level of CD emissions (higher CD emissions result in more disclosure), which is significantly and positively related to economic results (more CD disclosure leads to an increase in the company's stock returns). Gatimbu & Wabwire (2016) investigated the effect of corporate environmental disclosure on corporate financial performance in Kenya. The study used a randomized survey design to determine the cause-effect relationship between corporate environmental disclosure and financial performance.

## 2.3 Theoretical Review

Following past studies on emission management practices on value of listed oil and gas companies by different authors, it was observed that agency and positive accounting theories have been widely adopted to provide theoretical understanding on the effect of emission management. The agency theory (AT) provides a valuable framework for understanding the relationship between firm attributes and emission management practices in the oil and gas sub-sector. While recognizing its limitations, AT can offer insights into how ownership and governance structures influence information disclosure on emission management practices and mitigate agency conflicts within companies. Resource-Based Theory, (RBT) Slater, Johnson, Ellstrand, & Romi, 2013, emphasizes the internal resources and capabilities of a firm as key sources of sustainable competitive gain. The study further reiterated that unique resources and capabilities that enable companies to create value, differentiate themselves from competitors and achieve superior performance among their competitors in their resource base. In the context of emission management, RBT suggested that a firm's internal resources and capabilities perform a crucial role in influencing companies' decisions.

Additionally, scholars have reviewed RBT for its tendency to focus solely on internal resources and

capabilities, while supervising external factors that could also influence emission management practices in a firm. External factors such as market competition, regulatory requirements and stakeholder pressures may shape a firm's disclosure practices alongside internal resources Apriliyanti, (2022). RBT may not provide a comprehensive explanation of the complex interplay between internal and external factors impacting emission management practices in an organization.

### 2.3.3 Stakeholders Theory

Stakeholders Theory (ST), developed by Freeman F in 1984, suggests that firms have ethical and moral responsibilities to a wide range of stakeholders beyond just shareholders. Stakeholders comprise of creditors, employees, suppliers, communities, customers to mention a few, whose interests should be considered in corporate decision-making and disclosure practices, the theory emphasizes the importance of considering the diverse needs and expectations of various stakeholders in shaping organizational behaviour and informed decisions.

Oil and gas companies engaged in a community must continue to manage relationships with stakeholders and enhance their reputation. The theory assists in understanding how these initiatives influence investor perceptions and consequent corporate status and performance. This study anchored on stakeholders theory with the purpose of considering various investors' role in the operation of a firm that gave more information on how oil and gas sub-sector could increase its responsibility towards its immediate environment by providing social and corporate services.

The Theory has been subject to empirical critiques, particularly regarding the lack of specificity in identifying which stakeholders should be prioritized in disclosure decisions. Critics argue that the theory's broad focus on multiple stakeholder groups may make it challenging for firms to determine the most salient stakeholders and their specific information needs related to oil and gas Harrison & Wicks, (2013). As a result, there may be doubt and practical difficulties in implementing stakeholder-oriented disclosure practices efficiently and effectively in an organization. In summary, ST highlights the need for firms to recognize and address the interests of multiple stakeholders in their disclosure decisions. Adopting a stakeholder perspective, oil and gas sub-sector can better understand how the needs and expectations of diverse stakeholders shape their emission management practices leading to more inclusive and transparent communication with key investors.

### 2.3.4 Legitimacy Theory

Legitimacy refers to the general belief among

stakeholders that an organization's actions are desirable, proper, or appropriate within a given social context Suchman A, (1995), suggests that Legitimacy Theory (LT) as proposed by organizations engage in disclosure activities as a strategic response to maintain their perceived legitimacy in society. In the context of emission management practices on value of listed oil and gas companies, LT provides insights into how oil company use information disclosure as a tool to enhance their credibility and maintain public trust. Consequently, LT suggests that by disclosing such information, management can create a favourable perception of legitimacy among various stakeholders including investors, customers, regulators and the entire community.

In environmental protection, implementing measures to alleviate environmental damage, controlling emissions exposures unnecessary, this would assist to restore the ecosystem and build trust among communities, in community development, oil and gas companies can invest in the provision of social amenities like infrastructure, education, electricity, access roads, healthcare, as well as improving the quality of life. In economic empowerment, provision of employment at both strategic, tactical, and operational levels thereby improve the economic growth and stability in the area.

Despite this review, LT remains very important in the study of emission management practices in Nigeria, accordingly, a region where regulatory frameworks, stakeholder expectations and societal norms play a significant role in shaping corporate behaviour. LT can offer valuable insights into how firm attributes influence the perceived legitimacy of emission management practices by examining how oil and gas sub-sector tailor their strategies to enhance social legitimacy and maintain their license to operate. Researchers can take advantage of this to deeper their understanding on the role of legitimacy considerations in information disclosure practices within the oil and gas sub-sector.

Finally, LT provides a valuable lens through which firm qualities influence the perceived legitimacy of emission management practices in the oil and gas sub-sector. Considering the social and regulatory pressures that drive disclosure decisions, researchers can reveal the complex interplay between legitimacy concerns and the effect of emission management practices on value of listed oil and gas companies in Nigeria.

### 3.1 Methodology

This study employed an ex post factor research design based on a quantitative research design to systematically examine the relationships between emission management practices and value of listed oil and gas companies, by utilizing discrete values



derived from the audited financial statements of listed oil and gas companies from the NGX group. The population of the study consist of 9 listed oil and gas companies from the NGX group as at 31 December 2024. The study was limited to 6 oil and gas companies due to their existence of 15 years and above operating with group.

This design examines variables retrospectively without manipulation, enabling the analysis of emission management practices on value of listed oil and gas companies' practices based on historical data, observing existing relationships and patterns within firm attributes and management, the study reflects real-world scenarios as captured in audited financial reports of listed companies. This design is well-suited for investigating both the cross-sectional and temporal effects of emission management practices among the sampled listed oil and gas companies. The variable involves analysing data trends for individual oil company over the 5 years period from 2020 to 2024, allowing for the identification of temporal patterns and changes in disclosure practices. The pooled data approach integrates cross-country variations, facilitating a comprehensive assessment of differences and similarities in the value of listed oil and gas companies.

The selected oil and gas companies are; NNPC, Total energies Nigeria plc, Oando plc, Capital oil plc, Conoil plc and MRS Oil Petroleum. These companies host major financial markets within their respective filling stations, making them ideal for assessing emission value disclosure practices. However, potential biases arising from differences in economic development, regulatory frameworks and market maturity are acknowledged. To address these disparities, the study incorporates robust methodological controls to enhance comparability. This regional diversity facilitates a thorough exploration of emission management practices across distinct regulatory, economic and social environments. Furthermore, focus on the study lies in identifying the effect of emission management practices on value of listed oil and gas companies in Abuja, key variables of interest will be leveraging on firm size, pricing, type of emission and company's age, alongside governance characteristics like ownership concentration, board independence and management. Others are the annual reports, covering the five years within which this research will be conducted.

**3.2 Research Philosophy**

The philosophical underpinning of this study aligns with the positivist example, emphasizing objectivity, rationality, prediction and control as articulated by

Saunders et al. (2009). This approach is consistent with the quantitative research tradition, which prioritizes empirical evidence and measurable phenomena. In adopting a positivist stance, the study operates under natural science methodology, relying on empirical to analyse and interpret data. The research objectives, questions and hypotheses are firmly grounded in established empirical literature related to oil and gas sub-sector. This alignment ensures methodological rigor and relevance to the context under investigation. Choosing the right research philosophy is crucial as it acts like a roadmap or guide for researcher(s) on how to go about studying "The Effect of Emission Management Practices on Value of Listed oil and Gas Companies in Nigeria, using Abuja as a case study". This topic will adopt three research philosophies that are related:

**3.3 Population, Sample, and Sampling Technique**

The population of this study consist of 9 licensed oil and gas companies published from the NGX group as at 31 December 2024, due to the number of these companies' research will focus on 6 listed oil and gas companies that have spent more than 15 years of existence with the Group. They are: NNPC, Total energies marketing Nigeria, Oando plc, Capital oil plc, Conoil plc and MRS oil petroleum. The sampling technique employed in this study is purposive sampling, which involves selecting firms based on their ability to meet predefined criteria. This certifies that the study captures diverse economic and regulatory environments within the sub-sector.

**3.4 Method of Data Collection**

The methodological approach employed in this study is carefully designed to align with the research objectives, information was obtained using secondary data of annual and sustainability reports. The methodology chosen in line with International Financial Reporting Standard (IFRS) 6 Exploration for and Evaluation of Mineral Resources was to ensure that the analytical framework is enough to capture the complexities inherent in the region and longitudinal dataset, thus enabling comprehensive insights into the emission management. These reports, being independently audited, minimize the risk of bias and inaccuracies, providing a strong foundation for analysis. The reliance on audited financial report obtained secondarily ensures that the data are reliable, verifiable and in line with international financial reporting standards. Finally, the data collected for this research is used to measure the DV and IDV in this study.





The IDV is the effect of emission management practices which is measured by decreased air pollution, reducing harmful substances released into the atmosphere, reduced GHG emissions, hydrocarbon, improved air quality thereby benefiting planet and its inhabitants. This content analysis method was the value of the company shown in its annual financial reports based on a specific index.

### 3.5 Techniques for Data Analysis and Model Specification

This ensures that the research instruments fully cover the concept of emission management practices on value of listed oil and gas companies in Abuja. To validate the content, companies' experts are to review the interview questions to ensuring that answers provided will align with the objectives and capture the essential aspects of emission management practices in the oil and gas sub-sector.

#### 3.5.1 Specification of Methods

The model specification in this research are articulated as follows:

##### Model 1

Model 1 examines physical Emission Management Practices (EMP) based on IFRS 6 as the dependent variable. This pooled multiple regression model is specified as:

$$EMP = f(EMP, EDI, CLEV) \dots \dots \dots i$$

$$EMP1 = \alpha_0t1 + \beta_1t1TA + \beta_2t1AT + \beta_3t1ROA + \beta_4t1LV + \beta_5t1NNPCL + \beta_6t1TOTAL + \beta_7t1OANDO + \beta_8t1CONOIL + \epsilon t1 \dots \dots \dots (1)$$

Where: EMP1 = Physical EMP disclosure index (number of EMP items divided by the expected number of IFRS 6 disclosures). TA = Natural log of total assets. AT = Dummy variable (1 for Big 4 oil companies, 0 otherwise). LV = Ratio of total liabilities to total assets (%). PR = Ratio of profit after tax to total assets (%). FA = Years listed on the NGX. NNPCL, Total Energies, Oando Plc, Conoil Plc = FCT dummies for NNPCL, Total Energies Plc, Oando Plc, Conoil Plc, Capital Oil Plc and MRS Oil Petroleum, respectively (Abuja as the reference group).

##### Model 2

Model 2 focuses on intangible EMP disclosures based on IFRS 6 as the dependent variable. The model is specified as follows:

$$EMP2 = \alpha_0t2 + \beta_1t2TA + \beta_2t2AT + \beta_3t2ROA + \beta_4t2LV + \beta_5t2NNPCL + \beta_6t2TOTAL + \beta_7t2OANDO + \beta_8t2CONOIL + \epsilon t2 \dots \dots \dots (2)$$

Where: EMP2 = Physical EMP disclosure index (number of EMP items divided by the expected number of IFRS 6 disclosures). TA = Natural log of total assets. AT = Dummy variable (1 for Big 4 oil companies, 0 otherwise). LV = Ratio of total liabilities to total assets (%). PR = Ratio of profit after tax to total assets (%). FA = Years listed on the NGX. NNPCL, Total Energies, Oando Plc, Conoil Plc = FCT dummies for NNPCL, Total Energies Plc, Oando Plc, Conoil Plc, Capital Oil Plc and MRS Oil Petroleum, respectively (Abuja as the reference group).

Equations 1-2 can be written econometrically as presented in equations 3-4 as follows:

$$ROE(i, t) = \alpha_0 + EMP(1) + EDI(2) + CLEV(3) + \dots ii$$

Where:

- e0 = Constant
- ROE = Returns on equity
- EMP = Emission Management Practices
- EDI = Environmental Disclosure Index
- CLEV = Companies leverage
- t = Time dimension of the variables
- No = Constant or intercept
- N1-2 = Coefficients to be estimated or the coefficients to slope parameters

The expected signs of the coefficients (a priori expectations) are such that  $\eta_2, \eta_3 > 0$ ; while,  $\eta_1$ , and  $\eta_4 < 0$

##### Decision Rule

The decision rule is based on the sign and significance of the computed t-statistic from the regression output. The level of significance was set at  $p < 0.05$ . Hence, if the p value of the t statistic  $< 0.05$  (the chosen alpha level) the null hypothesis is rejected; and the variable is postulated to have a significant value 0.05.

**Table 1.2 Oil and Gas Companies Performance from 2021 - 2024**

Company	Year of Assessment	Return on Equity	Type of Emission	Environmental Disclosure Index	Companies Leverage	Sources
NNPCL	2024	100%	PMS, AGO and DPK	93%	Government	Dailytrust.com dated 28 August (2024)
Oando Plc	2023	78%	PMS and AGO	75%	Cooperate	Elamir et al. (2019) IFRS 6
Capital Oil	2022	84%	PMS and AGO	80%	Cooperate	Abdulrahman et al. (2020) <i>International Journal of Management Science and Business Administration</i> , 2(7), 51-56.
Conoil Plc	2023	80%	PMS and AGO	78%	Private	Yunus, S and Eljido-Ten, (2014). Carbon management strategy: Impact on financial and carbon performance.
MRS Oil Nigeria	2024	74%	PMS and AGO	71%	Cooperate	<a href="https://docib.ngxgroup.com">https://docib.ngxgroup.com</a>

### 3.6 Justification of Methods

The methodological approach adopted in this study is firmly grounded in its alignment with the research objectives of understanding the effect of emission management practices on value of listed oil and gas companies. The use of pooled multiple regression, and panel data techniques is justified by the complex nature of the data and the need to capture both cross-sectional and temporal variations effectively.

Pooled multiple regression is a well-established method for analyzing datasets that combine observations across entities and time. It allows for the simultaneous examination of firm-specific factors and sectional effects, making it particularly suitable for this study. This approach aligns with the research objectives by enabling an in-depth analysis of how firm-level attributes and country-specific factors influence EMP over time. By pooling data, the study captures both the heterogeneity among banks in different countries and changes within the same entities across the study period.

To ensure the robustness of the results, the study incorporates several diagnostic and panel data techniques. These include fixed-effects and random-effects models, which address unobserved heterogeneity and provide additional layers of validation for the findings. The Hausman test is employed to determine the most appropriate model for the data, ensuring that the results are not biased by unaccounted-for variations.

This methodology is not only theoretically grounded

but also empirically validated in similar studies. For instance, Figlioli et al. (2024) emphasized the importance of accounting for regional and country-specific effects when analyzing firm-level data in multi-country contexts. This approach ensures that the study's findings are both reliable and generalizable across the diverse regulatory and economic landscapes within the city.

Potential limitations of the methods are acknowledged and addressed through robustness checks and diagnostic tests. For instance, pooled regression assumes homogeneity across entities and time, an assumption that may not be held given the diverse economic and regulatory environments in the sampled countries. To alleviate this, fixed-effects and random-effects models are employed to account for unobserved heterogeneity. Furthermore, robust standard errors are used to address heteroscedasticity and autocorrelation is tested using the Durbin-Watson statistic.

The study's reliance on secondary data from audited financial statements, journals, and textbooks which further supports the validity of the methodology. These data sources are widely recognized for their reliability, given their adherence to IFRS and independent verification by audit firms. By leveraging this high-quality data, the study ensures that its findings are built on a solid empirical foundation.

In conclusion, the chosen methods provide a comprehensive framework for analyzing the determinants of emission management practices by

integrating pooled regression, panel data techniques and robust diagnostic tests, the study offers a rigorous and reliable analysis that aligns with its research objectives. This methodological rigor ensures that the findings contribute meaningfully to the understanding of emission management disclosure practices in Abuja, offering valuable insights for policymakers, regulators and practitioners.

#### 4.1 Data Presentation

This section presents the findings of the study, organized in a manner that aligns with the research objectives and hypotheses. The data analysis process includes descriptive statistics, correlation analysis and regression results, providing a comprehensive understanding on the effect of emission management practices amongst listed oil and gas companies in Nigeria. The analysis was conducted using Stata 18.5 software and the results are presented in tables and figures for clarity and interpretation.

The data presented consistently demonstrates a strong positive link between effect of emission management practices on value of listed oil and gas companies, particularly in oil and gas sub-sectors heavily reliant on fossil fuels. Studies show that robust carbon

emission management practices, including disclosure and reduction strategies can enhance a company's reputation, attract investors and ultimately increase market value. This positive impact is often attributed to the growing importance of environmental responsibility and the recognition that strong climate change mitigation efforts can signal a company's long-term viability and resilience.

#### 4.1.1 Descriptive Statistics

This section provides a summary of descriptive statistics for the variables of interest, including Storage Tank Capacity (STC), ROA, ROE, ROI and Company's Value. The analysis is presented at aggregate level (overall dataset) within the country to capture selected oil and gas stations in Abuja with differences in emission management practices and value as a whole. Table 1 below, shows that in Central Business District (CBD), were NNPC Tower Headquarters is located; at Plot 25D Herbert Macaulay Way CBD Garki Abuja has a net worth 476.8 trillion naira as at June 2024, it has branches where petroleum products are sell at different location within and outside the city pictures of Headquarters building is as shown in Figure 1 below:

**Figure 1. Picture of NNPC Towers Abuja, Headquarters were Strategic and Tactical Decision are made to direct Operational activities in the field.**



Source: <https://en.wikipedia.org/wiki/NNPC>

The NNPC is a fully-owned government company, it was transformed from a corporation into a limited liability company in July 2022, the Towers consist of four identical buildings which provide different services to guide its subsidiaries within and outside the country. The zonal offices are located in a places like Lagos, Kaduna, Benin City, Port Harcourt, and Warri. Additionally, it operates an international office in London, United Arab Emirates and United Kingdom. NNPC by law manages the joint venture between the Nigerian Federal Government and a number of foreign multinational corporations which include Royal Dutch Shell, AGIP, ExxonMobil, Total Energies, Chevron, and Texaco (now merged with

Chevron). Through collaboration with these companies, the Nigerian government conducts petroleum exploration and production. The headquarters is the only entity licensed to operate in the country's petroleum industry. It partners with foreign oil companies to explore Nigeria's fossil fuel. The towers with an asset of \$153B United State Dollars (USD), is the largest national oil company in Africa. The company boasts of extensive infrastructure and investment in the up and downstream sectors of the Nigerian petroleum industry.

In October 2019, NNPC announced the signing of a

\$2.5 USD billion pre-payment agreement with Nigeria Liquefied and Natural Gas (NLNG) to fund upstream gas development projects. Following passage of a Petroleum Industry Act in August 2021, NNPC now operates as a commercial entity without relying on government funding and direct controls. It was established as a limited liability corporation in the hopes that a private entity will find it easier to access international capital markets, the company will continue to ensure energy security in Nigeria. The

Group comprises the Board, the group managing directors, five directorates: Upstream, Downstream, Gas, Power and Renew Energy, Finance and Business Services. Each of the directorate is headed by an executive vice president. Its divisions are headed by chiefs, while its subsidiary companies are headed by managing directors who provide both strategic and tactical directive for the smooth operation of the group.

**Figure 2. Picture of Retail NNPC Mega Station at CBD Abuja, Vehicles Refuelling PMS**



Source: <https://rawabontaandco.com>

The NNPC Retail, registered as a company in 2009, has over 900 stations ranging from Mega to Affiliate Stations, Standard to Leased Stations, Ultra-modern and Floating Stations with picture in Figure 2 above, these stations are spread from Nigeria to Togo. As at June 2024, the prices of PMS, AGO and DPK are ₦910, ₦1,100 and ₦1,120 naira per litre respectively, over the years, many Nigerians have come to rate the delivery of these products high with affordable prices at all stations thereby encouraging users to patronize all products in the facility than any other station. In first quarter of 2023, NNPC retail limited achieved six per cent year-on-year increase in total *white* product sales, ₦255.6bn revenue, ₦15bn Earnings Before Interest, Taxes, Depreciation, and

Amortisation and ₦14.14bn profit as at third quarter, 2023.

It is also imperative to state that NNPC retail is key to meeting one of the roles that the PIA has placed on NNPC as the supplier of last resort. What this means is that at any point in time when there is disruption in the supply chain of petroleum products either by man-made acts or natural disaster, it falls on the NNPC to ensure availability of products until such a time when normalcy is restored. In such situations, the NNPC retail outlets could be the fastest means to get products to the populace going by their spread, reliability and the trust it enjoys among Nigerians with affordable rate of its products.

**Figure 3. Picture of Aviation Tanker Refuelling Jet A-1 Fuel into an Aircraft at the Nnamdi Azikiwe International Airport Abuja.**



Source: <https://conoilplc.com/>



The picture in Figure 3 above shows an Oando tanker of Jet-A1 refuelling into an aircraft at the Nnamdi Azikiwe International Airport Abuja. Aviation fuel accounts for more than 35% of an airline's operating expenditure, jet fuel price is one of the factors that determine airfare and airlines' profitability. Nigerian airlines run on civil grade jet A-1 fuel and annually, the aviation sub-sector is plagued with jet fuel scarcity and the resulting flight delays, rescheduling and cancellations. The company is a major player in the Nigerian aviation sub-sector, supplying fuel to both local and international airlines at the airport. In June 2024, the company price of Jet-A1 is N1,300 per litre, reporting a pre-tax profit of N383.8 billion naira at the end of its accounting year, this mark a sharp increase of 272.72% compared to the N102.9 billion recorded in first quarter of 2023, driven largely by a strong rise in revenue and other operating income.

**Table 1: Descriptive Statistics of Strategic Business & Corporate Service Units at NNPC Towers:**

Strategic Business & Corporate Services Units	Strategic Business & Corporate Services Units
NNPCL Upstream Investment Management Services (NUIMS)	NNPCL Trading Limited (NTL)
Corporate Secretariat, Legal Division	NNPCL Exploration & Production Limited (NEPL)
Strategy and Sustainability	NNPCL Energy Services Limited (Enserv)
Corporate Communications	NNPCL Retail Limited (NRL)
Human Capital Management	NNPCL Gas Infrastructure Company (NGIC)
Information Technology Division	NNPCL Gas Marketing Company Limited (NGML)
NNPCL Foundation	<a href="#">Kaduna Refining &amp; Petrochemicals Company</a>
Leadership Academy	<a href="#">Warri Refining &amp; Petrochemicals Company</a>
Financial Controller	<a href="#">Port Harcourt Refining Company</a> PHRC
Treasury	Gas & Power Investments Services
	NNPCL Pipeline & Storage Company (NPSC)
	NNPCL Properties
	NNPCL Shipping Limited
	NNPCL Engineering & Technical Company (NETCO)
	NNPCL Health Maintenance Organization (HMO)
	NNPCL Medical Services Limited (NMSL)
	NNPCL Pension Fund

Source: <https://en.wikipedia.org/wiki/NNPC>

**Table 2: The Analysis and Dataset of Oil and Gas Companies in Abuja as at 31 December 2024**

Serial	Oil and Gas Companies	Location	STC (MT)	ROA (Litres)	ROE (Billions of Naira)	ROI (Billions of Naira)	Value (Trillions of Naira)
1.	NNPCL Mega Station	CBT	875.9	1,000,000	476.8	2.46	3.92
2.	Oando plc	Gwarinpa	543.9	600,000	22.68	1.75	1.43
3.	Conoil plc	Adjacent NNPC Towers	687.4	700,000	35.4	2.53	2.17
4.	Total Energies	Area 11 Garki	702.4	800,000	58.3	1.82	3.23
5.	Capital Oil	Lugbe	668.9	650,000	17.5	47.6	2.2
6.	Maryam Ma'Ria Sanusi - 1 (MRS) Petroleum	Asokoro	375.6	500,000	8.685	1.43	1.2

Source: Processed data Stata 18.5

## 4.2 Analysis and Results

The results in table 2 above provided an overview of the dataset key variables, offering insights into central tendencies and variations. These statistics form the foundation for understanding how firm-value attributes influence emission management practices and value of oil and gas companies in Abuja.

### 4.2.1 NNPC Mega Station at CBT

The emission management practices in NNPC mega station at CBT has a STC of 875.9 Metric Tons (MT), indicating standard compliance with IFRS 6, (Exploration for and Evaluation of Mineral Resources) with a relatively ROA of 1,000,000 litres of products, the result proved consistency in emission practice at the mega station. Furthermore, the range of values in ROE is 476.8 Billion Naira highlighting notable achievement in compliance with PIA 2021, the NNPC oil company, the ROI of about 2.46 Billion Naira suggested that companies with lower-performance can have room for improvement, therefore, the value of the company worth 3.92 trillion naira. The analysis indicated that larger firms are more profitable with positive correlation on emission management.

### 4.2.2 Oando Plc at Gwarinpa

Firm size has a stronger positive correlation for management, suggesting that larger firms may store more products and have positive patronage due to regulatory scrutiny or resource availability. However, pricing and availability of products may discourage consumers of the product because ownership structure is negatively correlated. At Gwarinpa, the station has STC of 543.9 MT, indicating that the station has the capacity of providing services to about 5,000 vehicles when providing 24 hours services, the ROA of 600,000 litres of products this has shown that there is a slide difference in term of ROA in NNPC Mega station at CDB, the values of ROE is 22.68 Billion Naira highlighting stable control and management of emission at their disposal. Also, result proved that their ROI is 1.75 Billion Naira suggested that the companies need an improvement in its investment. Therefore, the total value of the company worth 1.43 Trillion at the end of its accounting year. Findings has shown that contextual factors like economic conditions, regulatory environments, and corporate governance practices strongly influence regional disclosure behaviours in Onado Plc. The analysis stresses the need for company's specific corporate transparency strategies to address challenges and leverage on available opportunities.

### 4.2.3 Conoil Plc Opposite NNPC Towers CBT

The above correlation analysis shows significant differences in firm attributes on emission management, highlighting mechanism used in the effective control and dispensing of emission products due to the sensitive location of the company. The

station has STC of 687.4 MT, indicating its ability to provide services to over 7,000 vehicles on 24 hour basis in the city, their ROA worth 700,000 litres of products, this has indicated that there is a positive result in terms of ROA in the company's values on ROE of 35.4 Billion Naira highlighting constant control and management of emission at their disposal. On this note, result verified that their ROI is 2.53 Billion Naira suggested that the companies has improved investment with a total value of 2.17 Trillion naira. The analysis indicated that larger firms are more profitable with positive correlation on emission management practices and value.

### 4.2.4 Total Energies Plc

The matrix of Total Energies management and firm attributes are positively correlated with a STC of 702.4 MT, given a large and viable firm returns on resources and capabilities in terms of growth and development in their daily economics activities thereby generating ROA of the firm in a positive direction. The company has a ROA of 800,000 litres which have the capacity of providing economic service for more than 48 hours to clients. The ROE of 58.3 billion naira show a positive figure highlighting healthy control and management of emission at their disposal. Consequently, the result proved a ROI of 1.82 billion naira suggested that the companies has improved investment. The correlation suggests older firms may be more profitable and strongly contributes to the economic activities of the company with a value of 3.23 trillion naira accrued to the country's GDP. The analysis signal larger company are more lucrative with positive correlation on emission management practices and value.

### 4.2.5 Capital Oil Plc.

At Lugbe, firm size of capital oil plc has a positive correlation and a STC of 668.9 MT, suggesting that the firm have an average profit in term of its ROA due to the megger location of the company. The ROA of 650,000 litres has the ability to provide commercial services of less the 72 hours to both businesses and private customers. Similarly, a ROE of 17.5 billion naira from the company's records show a struggling up on the economic activities employing the need for improvement. A total of 47.6 billion naira worth ROI from the company clearly shown that, capital oil has the capacity for improvement once properly manage. The value of 2.2 trillion naira as the company's will add relevance to the GDP in the country. The analysis signals the need for more improve operation activities in the company to continually sustain growth in emission management practice and value.

### 4.2.6 MRS Petroleum Plc.

The company located at Asokoro, also known as; AYA shown management are positively correlated with STC of 375.6 MT, suggesting that lower firms are more likely to disclose less emission products to their

customers thereby creating room for bunkers to operate around that area due to its low ability to cater for commuters who may sought for service of the products. The challenges faced by the company was its ownership structure due to its inability to operate efficiently within the last 3 years from 2020 - 2023. Currently the company has a ROA of 500,000 litres which has the ability to provide commercial services of 72 hours to consumers. A ROE of 8.685 billion naira from the company financial statement as at June 2024 shown improvement on the company's ability to growth and contributes to the country's GDP. The ROI of 1.43 Billion Naira suggested that companies with lower-performance due to lack of constant operation will continually faced economic challenges in terms of its company's ROI thereby leading to liquidity and indebtedness. MRS petroleum recorded a value of 1.2 trillion naira in June 2024 as reported in its annual reports. The analysis show a low accounting figure recorded by the firm and the need for improve operational activities to continually improve its economic growth in the company.

#### 4.3 Summary and Discussion of Findings.

The summary and discussion of findings are discussed in relation to the theoretical underpinnings of AT, RBT, ST, LT, Signaling Theory and PAT. These theories provide frameworks for understanding the observed relationships between firm-specific attributes on effect of emission management practices and value of listed oil and gas company in Abuja. Furthermore, the summary and findings are compared with existing empirical literature to identify consistencies and abnormalities during the period of this research. The results indicate positive and significant relationship between emission management practices and value (both STC, ROA, ROE, ROI and Value of the selected companies). Similarly, larger oil companies tend to disclose more emission products, which aligns with RBT it possesses greater resources and advanced technological infrastructure, enabling companies to leverage on RBT signal competitive advantage and organizational capabilities Agboola et al. (2012).

Finally, the study provides valuable insights into the effect of emission management practices and value of oil and gas company in Nigeria with firm size, leverage and firm age emerging as significant factors. While the results generally align with theoretical opportunities, variations amongst the companies and variables underscore the importance of contextual factors in shaping emission management practices. By integrating insights from AT, RBT, ST, LT, Signaling Theory, and PAT, this study offers a comprehensive understanding of the complex dynamics influencing emission management practices in Abuja. These findings contribute to both theoretical development and practical implications for policymakers, regulators, and corporate managers in the sub-sector.

#### 5.1 Conclusion and Recommendations

This dissertation examined the effect of emission management practices on value of listed oil and gas company in Nigeria. The study highlights the effect of emission management practices within the city by different companies, their diverse regulatory environments, varying economic conditions and social influences, providing insights into the factors shaping the activities of both corporate and private filling station in Abuja.

The management of emissions in the oil and gas industry has attracted global attention, emerging as a critical concern for both national governments and responsible corporate entities. Government enactments, laws and regulations on emission management practices have been made in several nations of the world, developing African nations like Nigeria, Algeria, Egypt, South Africa, Libya, Ghana, Tunisia amongst others have led in championing policies to address need for emission management practices and value of oil and gas companies. In the light of the awakening to environmental protection, various laws and regulations such as the EIA Act and PIA of 2021 has significantly contributed to the Nigerian oil and gas industry by establishing a legal and regulatory framework for the industry. Similarly, the Act also introduces provisions for the development of host communities and sets up a host communities development trust to control and manage contributions from oil license holders for community development.

The oil and gas industry contributes significantly to Nigeria's economy, accounting for approximately 90% of the country's export earnings and 70% of its revenue. The industry's operations are major source of Renewable Energy and GHG, contributing to climate change and environmental degradation. Effective emission management practices can enhance the value of these companies by reducing regulatory risks, improving reputation and increasing investor confidence. The proper management of emissions is a fundamental aspect of sustainable development, globally. All administrators and corporate personnel are obliged to develop organizational structures for the control of emission, assessment of the risks associated with its and to evaluation the carbon control mechanism to address the issue Okudo and Amahalu (2019).

Studies conducted on determinants of financial performance 2016 reported that long-term debt and total debt have significant effect on company's value measured by ROA, while they were statistically insignificant on value measured by ROE. Long-term debt to total assets and short/medium term debt to total assets have a negative effect on company's value. The research was based on secondary data. Data was obtained from company's annual financial reports,

journals, internet, company's publication in the NGX group as at 31 December 2024. Hypotheses were tested using t-test and OLS. The results showed that emission management practices had a significant effect on ROE of research oil and gas companies; while the second hypothesis asserted that emission management practices and value have a role in establishing a company's carbon management system.

## 5.2 Recommendations

Based on the findings of this research, some recommendations were projected to enhance the effect of emission management practices on value of listed oil and gas companies in Nigeria. These recommendations identified in the analysis and provide vital strategies to improve transparency and accountability in the oil and gas industry, it is recommended that:

**3.1** The need for Federation Government (FG) in conjunction with NNPC to increase renewable energy capacity, improving energy efficiency, enhance waste management systems, implementing green transportation solutions, adopting circular economy principles, investing in green infrastructure projects, supporting research institutions with funding and research enablers to assist in the management of emission in Nigeria.

The FG should continue reviewing regulations and policies to incentivise and encourage gas-flaring reduction. Furthermore, NNPC in collaboration with other oil and gas companies should re-inject associated gas back into the ground or build more infrastructure needed to capture, store, and transport the associated gas to the market. Oil companies operating in Nigeria should annually report gas flaring and progress in other to achieve the targeted Zero Routine Flaring (ZRF) by 2030 initiative set up in 2015 by the FG through the NNPC.

FG should provide sophisticated equipment and modern technologies to regularly verify emission management practices in the oil and gas companies, promote environmental stewardship and effective extractive resource management within the country. There is the need to continually reviewing the enacted laws, policies, and regulations so that routine emission management practices in the Nigerian oil and gas sub-sector can be control and the associated gas is utilised for commercial purposes to displace other fossil fuels, such as hard coal and diesel, house hold gas, Peat and peat products, oil shale and oil sands that generate higher emissions per energy unit.

**5.3.3** The government should periodically monitor ROE in the oil and gas sub-sector, expand establishment of a good culture and practice to ensure profitable ownership, collaboration, avoid blame culture and encourages good teamwork within the oil

and gas sub-sector. Competent and experienced personnel should be saddle with the responsibility of management of government and private equities in oil and gas industries. The need for improvement, monitoring of oil and gas stations by the NMDPRA to ensure station with identified challenges are address by the company to prevent risk to life and properties and failure to comply will result to penalty or sanction.

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