e-ISSN 2795-3248
p-ISSN 2795-3222

www.gphjournal.org
SOCIAL SCIENCE AND HUMANITIES RESEARCH
Open Access
Global Publication House
International Journal

10.5281/zenodo.12684135 Vol. 07 Issue 06 June - 2024 Manuscript ID: #01475

Green Accounting Practice and listed Oil and Gas Companies Performance Metric in Nigeria

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Abstract

Green accounting practices have been getting attention from academicians, scholars, professional accounting bodies and practitioners. As one of the fastest – growing developing nations, Nigeria is also concerned about the ecological challenges and their potential impacts on different sectors' overall performance. The aim of this study is to empirically explore the relationship between green accounting practice and listed oil and gas companies performance metrics in Nigeria. Panel data on different types of green accounting practice and Tobin's Q from 2010-2023 were collected from the Nigerian exchange group, annual report of listed oil and gas companies, and federal inland revenue service pro-mass descriptive statistics, panel unit root test Hausaman Test, Multiple Regression Analysis, Panel Cointegration Test, Pairwsie Panel Causality Test and Error Correction Model Test were used in analyzing the data. The results indicate that green accounting practice significantly relate to Tobin's Q; explain about 83.4% of the total variation in Tobin's Q Green Investment, initiatives, activities were each found to significantly relate to Tobin's Q. The study therefore conclude that green accounting practice has the potency to make significant contribution to performance metric and recommends that oil and gas firms should develop sustainability strategies aligned with their business goals, prioritize green investments with high Tobin's Q, involve stakeholders in decision-making, monitor and measure impact, collaborate with partners, and communicate effectively.

Keywords:

Green Accounting, Financial Performance, Green Investment, Green Activities, Green Initiative.

Introduction

Over the past last two decades, companies exist to provide value to their stakeholders; as such, a company that doe sot provide this need not exist. This value that is expected by stakeholders (Nwaiwu, 2023), Managers (Ashari &Anggoro, 2021) payables (Azahra, Akuntansi& Banding, 2021), employees, and investors (Brooks &Olkonomon, 2022) is subjectively relevant to each individual and company (Budiharjo, 2019).Environmental degradation and the latest global warming phenomenon, and the climate change debate have become central to the natural discussion. An institutionalized business structure is desperately need to cope with ecosystem costs and natural capital degradation (Nwaiwu& Oluka, 2018; Chasbiandani, Rizal, & Satria, 2019; Chiamoyu& Okoye, 2020; Budiono & Dura, 2021; Arslan, Kausar, Kunnaiah, Shabbir, Khan & Zamir, 2022; Nwaiwu&Doobee, 2023). In the last decades (Adekunmi, Adedogin, & Adewole, 2015), States (Agrawal & Sharma, 2020; Nwaiwu, 2023), legislators (Agrawal & Sharma, 2020; Almaliki, 2020), activist organizations (Arggrani, Aryani &Prasetyo, 2020), businesses (Ashari &Anggoro, 2021), and the public worldwide have become more aware of environmental concerns (Johnstone, 2018; Astati& Yadnya, 2019; Deb, Saha & Rahman, 2020; Cartez & Cudia; 2021). Numerous debates have been held on climate transformation, environmental deprivation, ethics, marginalization (Azahra, Akuntonsi& Banding, 2021), social duty (Budiharjo, 2019; Nwaiwu, 2023), strong group voices creation (Doobee&Nwaiwu, 2023), radicalism movements (Chasbiandani; Rizal & Satria, 2019), and protests against capitalism (Azam, 2016; Deb, Rahman. & Rahman, 2022; Nwaiwu, 2023). Environmental protection practices, which were confined to households and towns in the past, have become a commercial requirement (Miroshnychenko; Barontini& Testa, 2017; Nwaiwu, 2023). In particular, the role of accounting has been applied to the measuring and analyzing of environmental aspects of an undertaking via environmental management accounting beyond the confines of traditional financial reporting (Cullen & Whelan, 2023).

Green accounting is an accounting tool that provides information n the environment. Such as the amounts of waste generated (Wijayantu; Suhadak, Dzulkirom&Nuzula, 2019), the amount of radiation emitted (Yaliarini, Olhman&Smaila, 2017), emission of carbon (Tu & Huang, 2015; Utami & Nurani, 2020), etc., in support of internal corporate decision making (Saman, 2019; Pei, Zhu & Wang, 2021). Considerable of green accounting study concentrates as an externally focused practice on environmental disclosures (Oti, Effiong, &Tiesieh, 2022; Benvolio, 2023). Prior research on green accounting has shown that this approach is most beneficial to business in environmentally subtle manufacturing (Olusegun, 2012; Okoye &Ezejiofor, 2018; Okafor, 2018; Ogouni&Ekpalu). The main argument is the twin global of green accounting to lessen the adverse environmental influence of a manufacturing corporation and decrease operating costs associated with protecting the environment (Ochotorena, 2017; Nwaiwu& Oluka, 2018). But eco-friendly accounting is a complex and diversified phenomenon. As a result, there is an upward trend in green accounting, i.e. assembly and using ecological knowledge to improve management policy making Nnamani, Onyekwelu& Ugwu, 2017; Nju, Ghang, Yang & Wang,2017; Menike, 2020).

However, more and more organizations have been faced with environmental accountability concerns, leading to growing global interest and greater stakeholder understanding. Green accounting and monitoring financial intensity are increasingly a concern for taxpayers (Muhammod, 2018; Maharani &Handayani, 2021), payables (Malik & Mittal 2015; John, 2023) and the general public (Maharani &Handayani, 2021). In their day-to-day operations, organizations are also focused on protecting the environment. It shows that environmental problems (for example, waste, energy crises, climate change, etc) build business entities' opportunities and not just threats (Thevanes&Arulrajah, 2016; Uzoma, 2023). When society is more concerned with the performance of the environment, businesses have implanted environmental management practices. This benefited the organization both environmentally and economically (Shaumya &Arulrajah, 2017). Environmental consciousness has made people's ecological success around the world concerned with green accounts (Ahmad, 2018, Waseer, Hussain & Ammara, 2018; LU & Taylor, 2018).Also, by reviewing the green initiative's report, the green accounting practices can be monitored to perform green activities (Eze, Nweze, &Enekwe, 2016; Eilola, 2017), green investment (Deb et al., 2020; Bach et al., 2021), and green initiative (Asnawi&Anggoro, 2012) in the organizations.

Prior empirical findings have inconclusively narrowed down the effect of green accounting component on financial performance resulting to controversies by varied schools of thoughts on the subject. Zhana and Chen (2017), Yang, Wen and Li (2020), Zhang, Mu, Zhan, Yu, Liu, Yu and Zhang (2022), Liu, Khan, Aslam, Resheed and Mohsin (2022), the inconclusive prior empirical findings of the relationship green accounting and firm performance have led to conflicting results due to the three competing schools of thoughts that exist recently in the field; that better green accounting improves financial performance; the contrary that better financial performance does not improve financial performance and that which opine that there is no connection between green accounting and financial performance (Gonawan&Evriami, 2022; Gong & Lu, 2022).

Consequently, opines have been strong and dominated between the classical school (proponents of negative effect) and the contemporary school (proponents of positive effect) on this aged dichotomy that these have given birth to postulations on the effect of green accounting on firm performance. The classical proponent viewed all costs as reduction in profits with consequential negative effect, therefore, the basis of cost reduction strategies. For them, all manner of cost (including, green accounting costs) are inversely related to financial performance (Baah, Opok-Aggeman, Acquah, Aggabeng – Mensah, Afum, Failbil& Abdoulaye, 2021; Erlanyga, Fanzi& Sumiati, 2021; Maharani &Handayani, 2021; Gow & Peng, 2022; Dhar, Zarkar&Ayathey, 2022; Nwaiwu, 2023). This is the bedrock of traditional accounting and reporting that also anchors cost minimization strategies and narrowed perspective on financial performance (Bassey, Effiok& Eton, 2013; Deswanto& Siregar, 2018 Gonawan&Evirani, 2022; Sarstedt; Ringle & Hair, 2022; Zhang et al., 2022; Goo & Peng, 2022). Therefore, the divergent opinions on the subject with short comings and variances of prior empirical studies have necessitated a study to offer some improvements and to establish empirically the relationship between green accounting component and performance of oil and gas firms in Nigeria.The remainder of this paper is organized as follows: Section II discusses the review of related literature on green accounting practice and performance. Section III lays out the analytical framework and econometric methodology, Econometric results and discussion are reported. Section IV. Section V consists of conclusion and recommendations, limitation and suggestion for further studies.

Review of Related Literature and Hypotheses Development

This section reveals related literature on green accounting practice and performance metric. It consists of green investment management, initiatives, activities and Tobin's Q.

Theoretical Framework

Systematic inquires into the relationship between green accounting practice and performance metric is rooted in the seminal works of Tobin's Q (1969).Tobin's Q (1969) developed a neoclassical investment model suggesting "the rate of investment -the speed at which investors wish to increase the capital stock should be related, if to anything, to Q, the value of capital relative to its replacement cost "(Tobin, 1969). Hence, Tobin's Q can be expressed as follows;

Tobin's Q (1969) = value of capital /Replacement cost of capital 2.1

From equation (2.1), one can easily see that, if Q>1, the market value exceeds replacement cost and agents will gain from investment in the opposite case of Q=0, agents will neither gain nor lose from investment. Another interpretation of Q is that, if a firm increases its capital stock by one unit, the present value of the profits, and thus the value of the firm will raise by Q (Romes, 2011). For an investor, it is the marginal Q, the ratio between marginal value of capital and its marginal replacement cost, that is of main interest rather than average Q, the ratio between the market value of existing capital and its replacement cost. Romer (2011) exemplifies this in an example of two firms: Firm A has 20 units of capital and adds 2 more, and firm B has 10 units of capital and add one more. If assuming diminishing (rather than constant) returns to scale in adjustment cost, the investment will be more than twice as costly in firm A than firm B. Hence, in this case, marginal Q is less than average Q.

Conceptual Framework

The study has developed the following systematic representation of the conceptual framework. In doing so, the data for determining the variables that should have to be included in the study were chosen according to the characteristics that they create more relationship between green accounting practice and performance metric.

Oil and Gas Companies Metric

Oil and gas companies metric performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. It shows the general well-being of a firm and its true financial performance (Eze, 2021). Financial performance can be seen as the level of performance of an organization at a point in time. This could be measured in terms of overall profits or losses or asset utilization. According to Uiemena and Okolocha (2019), the measures of financial performance of an organization are as varied as the motive for the measurements. Financial performance is measured to give the amount of stewardship by the management team to the shareholders. The key aspect of this involves measuring the profitability, return on investment, return on asset and growth prospect of a country.

Tobin's Q

The Tobin's Q ratio is a ratio devised by James Tobin of Yale University. Nobel Laureate in economics, who hypothesized that the combined market value of all the companies on the stock market should be about equal to their replacement cost (Bond & Cummins, 2004). Replacement value (or replacement cost) refers to the cost of

replacing an existing asset based on its current market price (Amahala, Okoye, & Obi 2018). Tobin's Q (also known as q ratio is the ratio between a physical asset's market value and its replacement value (Hayes, 2019). The Q ratio expresses the relationship between market valuation and intrinsic value. In order words, it is a means of estimating whether a given business or market is overvalued or undervalued (Hayes, 2019; Nwaiwu, 2022). The Q ratio is calculated as the market value of a company divided by the replacement value of the firm's assets.

$$\text{Q ratio} = \frac{\text{Total Market Value of Firm}}{\text{Total Asset Value.}}$$

Green Accounting Practice

The increasing awareness of environmental costs and their inclusion into corporate performance reporting has resulted in the development of a new environmental aspect of accounting (Yang & Wen, 2020). The growing concern on the environmental issues has actually led to the increasing importance of green accounting practice. Green accounting provides a framework via measuring present, past and future environment cost for decision-making and public communication (Utami & Nuraini, 2020).

Green Initiative

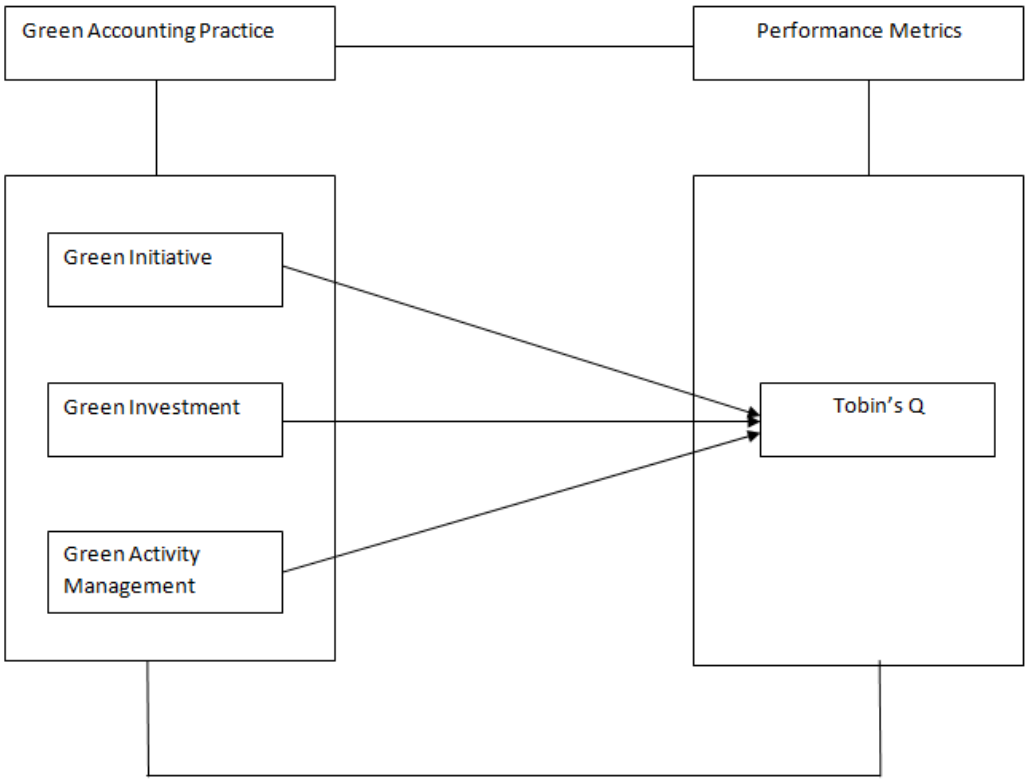
With the recent global climate change, more companies around the world emphasis on the adoption of green initiative sand to be more eco-friendly. The green initiatives may include waste management, reducing carbon emissions developing eco-friendly products and energy saving (Deb, Saha & Rahman, 2020). According to Kushwoha and Sharma (Erlangga, Fauzi, & Sumiati, 2021), Nwaiwu (2023) firms are adopting different green activities such as green marketing, green supply chain management, green innovation and other Ajike and Anjolajesu (Eze, 2021) also stated that many developed countries such as Johannesburg, South Africa, Rio de Janoiro, Brazil and developing countries such as Nigeria, Ghana and Mali are also adopting green initiatives to sustain their environment. According to Chen, Lai and Wen (2000), Nwaiwu and Joseph (2021), green innovation is described as innovation related to green products including energy-saving, pollution-prevention, waste recycling or corporate environmental management. In general, green initiatives are green activities invested by companies to create better environment.

Green Activity Management

Going green helps the environment by reducing the amount of pollution that enters the soil, water and air. By using alternative energy sources and avoiding the burning of fossil fuels, recycling and reducing waste and driving more efficiently, fewer pollutants are released into the environment. Green activities means any investigations study, assessment, evaluation, sampling, testing, monitoring, containment, removal, disposal, closure, corrective action, remediation, restoration, bioremediation, response, repair, corrective measure, cleanup or abatement that is required or necessary under any applicable environmental law, including, but not limited to, institutional or engineering controls or participation in a governmental voluntary clean-up program to conduct voluntary investigatory and remedial actions for the clean-up, removal or remediation of hazardous substances that exceed actionable levels established pursuant to environmental laws, or participation in a supplemental environmental project in particular while mitigation of fine or penalty.

Green Investment

Rapid changes in the market demand, increasing pressures from stakeholders, and rising complexity of products and services influence organizations to adopt new or different capabilities and management practices in order to remain competitive and efficient (Ranter, Globocnik; Perl-Vorbach, Baumgartner, 2019). Green investments have been profoundly studied with reference to the concept's definition (Mokhov, Chebotoreva& Khomenko, 2018; Falcone, 2018; Xing, Xia & Gao, 2019; Han, Li, Xiang, Luo & Chen, 2020. For sustainable development and for the performance of companies (Zhany, Wu, Feng & Yu, 2015; Dekovia, Grollem& Mzoughi, 2018) and the factors that influence them (Pekovie et al., 2018; Mokhovetal 2018; Han et al., 2020). Regarding the clarification of the concept, a relevant study (Ogoun&Ekpulu, 2020; Solomon, 2020) examined how green investments are defined in different asset classes (inventory's' bonds & alternative investments) and presents estimates of the size of these investments in different approaches. The study concludes that, given the lack of consensus on the use and definition of the term "green" the most productive approach could be to take an open and dynamic approach to definitions and standards. In a broad sense, sustainable investments are considered to be a concept that defines environmental, social, and governance investing, responsible investments, and socially responsible investments (Nnamani, Onyekwelu, & Ugwu, 2020).



Source: Firm Size (Nwaiwu& Benvolio, 2023), Green Activities (Ahmed, 2022, Nwaiwu, 2022), Green Initiative (Benson, Akabam, Ethel & Adesola, 2021), Green Investment (Carandang & Ferrer, 2020), Tobin's Q (Egbunike& Okoro, 2018).

Figure 2.1: Operational Framework of Green Accounting Practice and listed Oil and gas Companies Performance metrics of listed Oil and Gas Companies in Nigeria.

Empirical Review

Various studies in the past on green accounting practice and listed oil and gas companies with different variables, methodology, statistical analysis, different findings, conclusions and recommendation, their results were mix and inconclusive.

Toke and Kalpande (2024) undertook an analysis and provided guidelines on economic, social, and environmental issues for green accounting and reporting practices (GARPs) in the Indian automobile industry. A critical aspect in GARP is the implementation and evaluation of key performance indicators (KPIs). The data analysis for this work uses both qualitative and quantitative methodologies. A systematic questionnaire was utilized to gather the data, and barriers were found using the MINITAB analysis of variance (ANOVA) programme. The reliability of the identified KPI was tested using reliability analysis. The weights of KPI are calculated by analytical hierarchical process (AHP) analysis. The study report identified the lack of knowledge and inadequate strategic planning as significant barriers with a mean value of 3.53 and 3.3, and the calculated index value by AHP analysis for economic, social, and environmental factors is 0.364, 0.342, and 0.294. The identified weight of each GARP-KPI helps to automobile industries with self-assessment. It also supports improving the present situation by comparing the organizations on the basis of the KPI of GARP. This method compares the entire GARP performance and serves as a useful manual for an organisation looking to improve its green audit and reporting procedures.

Eze and Nkwo (2024) undertakes a comprehensive exploration of Green Accounting Practices, focusing on a comparative analysis of two key components: Environmental Accounting and Natural Resource Accounting, within the realm of business operations. As the global business landscape increasingly recognizes the importance of environmental sustainability, understanding the nuances of these accounting practices becomes imperative. Environmental Accounting represents a paradigm shift in how businesses account for the costs and benefits associated with economic activities. The integration of environmental data into financial systems allows for a more accurate evaluation of the true cost of production and consumption. On the other hand, Natural Resource Accounting focuses specifically on quantifying the depletion and degradation of essential resources like water, minerals, forests, and biodiversity. Together, these accounting practices aim to provide businesses

with a comprehensive toolkit for measuring, managing, and mitigating their environmental impacts. Through a comparative lens, this study seeks to delineate the similarities and distinctions between Environmental Accounting and Natural Resource Accounting in the context of business operations. It delves into the methodologies, metrics, and tools employed by businesses to account for their environmental footprints and natural resource utilization. By identifying best practices and potential areas for improvement, the research aims to contribute valuable insights to businesses, policymakers, and academics, fostering a deeper understanding of how environmental considerations are integrated into financial decision-making processes. The findings of this study have implications for enhancing corporate transparency, sustainability strategies, and responsible resource management, thereby promoting a more environmentally conscious and economically sustainable approach to business operations.

Chang et al., (2024) examines the impact of financing decisions and ownership structure on green accounting disclosure (GAD) in developing economies, where sustainability practices have not been extensively integrated into business models. We conducted empirical analysis considering 172 manufacturing companies from 2001 to 2022, utilizing both fixed effect and random effect estimation techniques. The findings revealed that firms that rely primarily on debt financing tend to have an inverse relationship with the levels of green accounting disclosure. However, firms that depend mainly on equity financing tend to have higher levels of green accounting disclosure. In addition, the results of the estimation analysis showed a favorable association between ownership concentration and disclosure of green accounting practices. The findings suggest that policymakers should consider incentivizing firms to prioritize equity financing over debt financing to promote higher levels of green accounting disclosure. Additionally, policies should aim at encouraging ownership concentration within firms to enhance the transparency and accountability of environmental reporting practices, ultimately advancing the achievement of Sustainable Development Goals 12 and 13.

Putra et al. (2024) determined the importance of corporate concern for the environment through the implementation of green innovation and green accounting on the performance of manufacturing companies. The research was conducted on manufacturing companies listed on the Indonesia Stock Exchange during 220-2021. Hypothesis testing using multiple linear regression. The total number of observations was 304. The results showed that green innovation has a significant effect on the impact of green accounting and firm performance. However, the implementation of green accounting in financial reporting has an insignificant effect on firm performance. Therefore, it can be concluded that the existence of green innovation in the production process will improve firm performance and the application of green accounting.

Romandhon et al., (2024) examined how disclosing green accounting information affects company performance. The data involves 43 companies listed on the Indonesian Stock Exchange (IDX) during 2019-2022. The data consists of the disclosure of qualitative information (number of report pages needed to describe each corporate social responsibilities (CSR) activity), quantitative green accounting disclosures (presence of tables detailing and comparing each activity), the volume of disclosure (number of pages of the annual report assigned to CSR), the business sector contribution to environmental damage, and company performance. Data were analyzed using linear regression. The results show that the ratio of the number of pages per activity has a negative effect. In contrast, the number of pages positively affects company performance. Meanwhile, a specific table has a positive effect only on ROE. Therefore, this study concludes that companies must develop green accounting as a quantitative approach to maintain company performance.

Janah et al. (2024) described the implementation of Environmental Accounting at BumdesPandawa Jaya in Rengas Pendawa Village which is implemented by BumdesPandawa Jaya. This research uses a qualitative method with a descriptive approach. Data collection techniques are carried out by means of observation, interviews and documentation. The research results show that BUMDES Pandawa Jaya has not implemented environmental accounting explicitly but only implemented environmental accounting implicitly through the waste management unit by incurring costs aimed at the environment. The implementation of environmental accounting is not yet optimal because costs incurred on the environment are not clearly detailed in the Bumdes financial reports and are still combined with other expenses. This is because Bumdes still uses a conventional or general accounting system which only classifies Bumdes performance income and expenditure, so that environmental costs are not visible.

Wati et al., (2024) examined the impact of the application of green accounting on increasing environmental awareness and public knowledge in the East Cirebon region. This research uses a qualitative approach with descriptive qualitative methods through in-depth interviews, observations, surveys, and distributing questionnaires to small and medium enterprises. The results showed that the application of green accounting in the East Cirebon region had a positive impact on increasing environmental awareness. By presenting accounting information that considers the environment, people can understand the economic impact of their activities on

local ecosystems. In addition, increased environmental awareness will lead to active participation in conservation programs and raise awareness of the importance of sustainability. Applying green accounting also helps increase community knowledge and support sustainable conservation efforts in the East Cirebon region. This study concludes that applying green accounting in the East Cirebon region can positively contribute to increasing environmental awareness and community knowledge. Therefore, local governments, businesses, and communities should work together to continue and expand the application of green accounting to achieve sustainable regional development.

Darti et al. (2024) analyzed Green Accounting as a mediation variable, and Media Exposure as a moderation variable in the relationship between profitability and CSR Disclosure in LQ45 companies in 2018-2022. This study used the population of LQ 45 companies listed on the Indonesia Stock Exchange during the period 2018-2022. The data used is secondary data in the form of annual financial statements and sustainability reports. The sample consisted of 20 companies that met the criteria during 2018-2022 as many as 100 samples. The data analysis used is a statistical analysis method with a path analysis model (Path Analysis). The results of the analysis show that there is no effect of profitability on CSR disclosure. There is no effect of profitability on green accounting. Profitability through green accounting has a significant effect on CSR disclosure. Green accounting mediated by media exposure has a significant effect on CSR disclosure.

Susilawati et al. (2024) aimed to analyze the profitability in mediating the influence of green accounting and corporate social responsibility disclosure on the firm value. The samples consisted of 220 manufacturing companies, while the moderating variable regression was used in data analysis. The effect of mediating variables was determined using the Sobel test. The study results showed that green accounting did not affect firm value; while CSR disclosure and profitability influenced firm value, but profitability was not able to mediate the effect of green accounting and CSR disclosure on the firm value. The unintegrated system and the company's inability to internalize green accounting and CSR disclosure hindered its non-financial goals to gain an advantage in a competitive market.

Table 1: Webometric Analysis of Green Accounting Practice and Performance Metrics of Listed Oil and Gas Firms in Nigeria.

Author(s)/Years	Country	Study Title	Methodology	Empirical Results
Toke and Kalpande (2024)	India	Analysis and guidelines on green accounting and reporting practices in the Indian automobile industry	Qualitative and quantitative methodologies; systematic questionnaire, MINITAB ANOVA, reliability analysis, AHP analysis	Identified lack of knowledge and inadequate strategic planning as significant barriers; calculated index values for economic, social, and environmental factors; identified weights of KPIs for self-assessment and improvement in green audit and reporting procedures.
Eze and Nkwo (2024)	Nigeria	Comparative analysis of Environmental Accounting and Natural Resource Accounting	Not specified	Explored methodologies, metrics, and tools for Environmental Accounting and Natural Resource Accounting; aimed to contribute insights for businesses, policymakers, and academics in integrating environmental considerations into financial decision-making processes.
Chang et al., (2024)	China	Impact of financing decisions and ownership structure on green accounting disclosure	Empirical analysis with fixed effect and random effect estimation techniques	Found inverse relationship between debt financing and green accounting disclosure, and positive association between equity financing and green accounting disclosure; suggested policy incentives for promoting equity financing and ownership concentration.
Putra et al. (2024)	Indonesia	Importance of green innovation and green accounting on manufacturing company performance	Hypothesis testing using multiple linear regression	Green innovation significantly affects firm performance; green accounting implementation in financial reporting has insignificant effect on firm performance.
Romandhon et al. (2024)	Indonesia	Impact of disclosing green accounting information on company performance	Data analyzed using linear regression	Negative effect of pages per activity ratio, positive effect of number of pages, and specific tables on company performance.

Janah et al. (2024)	Indonesia	Implementation of Environmental Accounting at BumdesPandawa Jaya	Qualitative method with descriptive approach	BumdesPandawa Jaya's implicit implementation of environmental accounting; environmental costs not clearly detailed in financial reports due to conventional accounting system usage.
Wati et al., (2024)	Indonesia	Impact of green accounting on increasing environmental awareness and public knowledge	Qualitative approach with in-depth interviews, observations, surveys, and questionnaires	Positive impact of green accounting on environmental awareness and community knowledge in the East Cirebon region.
Darti et al. (2024)	Indonesia	Green Accounting as a mediation variable, Media Exposure as a moderation variable	Statistical analysis with path analysis model	Green accounting mediated by media exposure significantly affects CSR disclosure.
Susilawati et al. (2024)	Not specified	Profitability mediating influence of green accounting and CSR disclosure on firm value	Regression analysis	Green accounting did not affect firm value; CSR disclosure and profitability influenced firm value, but profitability did not mediate the effect of green accounting and CSR disclosure on firm value.
Anakotta and Lambyombar (2024)	Not specified	Application of Environmental Accounting to Village-Owned Enterprises in Durjela Village	Qualitative research with data analysis techniques	Bumdes has not implemented environmental accounting effectively for green accounting.

Hypotheses Development

In line with the conceptual, theoretical, empirical study and arguments of various sociological researchers, the foregoing discussion provides the context for four important hypotheses that track the relationship between green accounting structure and performance indicator, formulated in the null form, wit:

H_{01}: There is no significantrelationship between green initiative and Tobin's Q.
H_{02}: Green investment does not significantly relate to Tobin's Q.
H_{03}: There is no significant relationship between green activities management.
H_{04}: firm size does not significantly moderate the relationship between green accounting structure and performance indicator.

Methodology

The research design applied is the ex-post factor and causal-comparative design which attempts to identify the cause-effect relationship between two or more variables. The target population are all listed oil and gas companies on the Nigerian Exchange Group which is ten but dropped to nine (9) by delisting Beco Plc as at 2016/2017 records of the Fact-Book. Sample size of six (6) quoted oil and gas companies were purposively selected to include only those operating on both upstream and downstream sectors. In line with the research decision on the sample, the behaviour of the oil and gas companies in both upstream and downstream sector when studies against a time series or period of eleven (11) years would result in sixty-six study observations to explain individually and collectively.

The data for the study were entirely secondary in nature because its design suggested content analysis on historical economic events and business transactions which were reported as green accounting components to justify compliance with performance. Such were obtained from the FIRS Pro-Max and annual corporate reports of the quoted oil and gas companies in Nigerian Exchange Group on the concerned corporate entities.

Operational Measure of Variable

The technical concepts among the study variables are measured operationally for analytical convenience under this sub-heading. The study will employ proxies in the literature to measure the criterion variable (performance) as Tobin's Q (Nwaiwu, 2013; Nwaiwu& Benvolio, 2023), Return on Assets (Ahari&Anggoro, 2021), and profit after tax (Ashuti& Yadnya, 2019; Moses, 2023). Similarly, the predictor variable green accounting component) which is discussed with its dimensions as green investment (Budiono & Dura 2021), green initiative (Chiamoga& Okoye, 2020), green activities management (Deb, Rahman, & Rahman, 2022) respectively. These criterion variables depict the adjustment that exists in performance to green accounting components. It is also employed in some empirical studies.

Tobin's Q: Tobin's Q is a financial metric that compares a firm's market value to its replacement cost. It is calculated by dividing the market value of the company by the replacement cost of its assets. This ratio is widely used as a measure of firm performance and efficiency in utilizing its assets to generate value for shareholders (Nwaiwu, 2013; Nwaiwu& Benvolio, 2023).The predictor variable, green accounting components, will also be measured using proxies based on the dimensions discussed in the literature:

Green Investment: This dimension refers to the financial resources allocated by a company towards environmentally friendly projects, technologies, or initiatives. It reflects the level of commitment to sustainability and environmental stewardship (Budiono & Dura, 2021).

Green Initiatives: Green initiatives encompass various actions and programs undertaken by a company to reduce its environmental footprint, such as implementing energy-saving measures, waste reduction strategies, or adopting renewable energy sources (Chiamoga& Okoye, 2020).

Green Activities Management: This dimension focuses on the organizational processes and practices for managing green activities effectively. It involves establishing policies, procedures, and systems to monitor, evaluate, and improve environmental performance across the company's operations (Deb, Rahman, & Rahman, 2022).

Table 2: Operational Measures of Variables

Variable	Operational Measurement	Measurement Method	Explanation	Proxy/Dimension	References
Criterion Variable	Performance	Financial ratios (e.g., Tobin's Q, ROA)	Represents the financial effectiveness	Tobin's Q	Nwaiwu (2013), Nwaiwu& Benvolio (2023)
Predictor Variable	Green Accounting Components	Survey/questionnaire	Reflects the extent to which a company	Green Investment	Budiono & Dura (2021)
			incorporates environmental considerations	Green Initiatives	Chiamoga& Okoye (2020)
			into its accounting practices and decision-	Green Activities Management	Deb, Rahman, & Rahman (2022)

Model Specification

The model specification is based on the theory that green accounting component contribute to total performance of quoted oil and gas companies in Nigeria (Dhar Sarkar &Ayithey, 2022). Specifically, the model from related empirical evidences used by Beswanto and Sireger, (2018), Erlangga, Fauzi & Sumiati (2021), Nwaiwu (2023) were adopted but the study made some modifications. The study generated three models to achieve the objectives and answer the corresponding research questions. Consequently, the model specification is formulated in the following functional forms;

$$TQ_{it} = f(GAM_{it}, GNV_{it}, GIN_{it}) \quad \text{i}$$

Expanding the functional form into mathematical model as thus:

$$TQ_{it} = \lambda_0 + \lambda_1 GAM_{it} + \lambda_2 GNV_{it} + \lambda_3 GIN_{it} \quad \text{ii}$$

Introducing error term into mathematical model to arrive at econometric model as thus;

$$TO_{it} = \beta_0 + \beta_1 GAM_{it} + \beta_2 GNV_{it} + \beta_3 GIN_{it} + \mu_{it} \quad \text{iii}$$

Where TQ_{it} = Tobin's Q 'I' for the period of time 't'

GAM_{it} = Green Activity Management 'I' for the period of time 't'

GNV_{it} = Green Investment 'i' for the period of time 't'

GIN_{it} = Green initial investment 'I' for the period of time 't'

Apirori Expectation

The study expects that green accounting components operations should deepen the level of management and consequently affect the financial performance of oil and gas firms. Therefore, the study expresses a positive apriori expectation mathematically below as follows;

$$\lambda_{1\text{-}5} > 0.$$

The aforementioned therefore shows that, an increase in green accounting components within the firm should increase the level of financial performance in terms of Tobin Q and profit after tax and vice versa.

Data Analysis Technique

The study used panel regression defined as an equation with one dependent variable and more than one independent variable. The researcher employed the Panel Least Square (PLS) estimation technique. The test instruments in the PLS are the T-statistics and probability values which were used to test the significance of variables and the overall significance of the regression respectively. Other test instruments also employed were the Durbin Watson test which was used to test the presence or absence of autocorrelation between and among the explanatory variables and the coefficient of determination (R- Square) used to test the percentage variation of the dependent and the independent variables.

Econometric Results and Discussion

Panel Stationarity Test

Within the panel unit root-testing framework, there are two generations of tests. The first generation of tests assumes that cross-section units are cross-sectionally independent; whereas the second generation of panel unit root tests relaxes this assumption and allows for cross-sectional dependence. In this context, we summarize the first and second generation of panel unit root tests that are often used in panel studies. The summary is presented as follows;

Table 3: Panel Unit Root Test at First Difference 1(1)

Variable	Test Methods	Coefficient	Prob.	Cross-section	Obs
TBQ	Levin, Lin & Chu t*	-3.72222	0.0001	6	66
	Im, Pesaran and Shin W-stat	-3.23990	0.0006	6	66
	ADF - Fisher Chi-square	60.7243	0.0003	6	66
	PP - Fisher Chi-square	153.412	0.0000	6	66
GRI	Levin, Lin & Chu t*	-11.6695	0.0000	6	66
	ADF - Fisher Chi-square	131.751	0.0000	6	66
	PP - Fisher Chi-square	206.693	0.0000	6	66
GIN	Levin, Lin & Chu t*	-17.0644	0.0000	6	66
	ADF - Fisher Chi-square	114.359	0.0000	6	66
	PP - Fisher Chi-square	189.744	0.0000	6	66
GAC	Levin, Lin & Chu t*	-19.7916	0.0000	6	66
	ADF - Fisher Chi-square	102.444	0.0000	6	66
	PP - Fisher Chi-square	211.472	0.0000	6	66
AST	Levin, Lin & Chu t*	-6.81568	0.0000	6	66
	ADF - Fisher Chi-square	80.5546	0.0000	6	66
	PP - Fisher Chi-square	130.796	0.0000	6	66

A unit root test is a statistical test that simply determines how bad or good the trend of employed data is for estimation purposes. The null hypothesis is rejected on the ground that the absolute value of the calculated ADF test statistic is larger than the absolute value of the Mackinnon critical value. This study adopted three test statistics (Levin, Lin & Chu t*, ADF- Fisher Ci-Square, and the PP-Fisher Chi-Square) to test the stationarity of the variables within the study periods. From the table above (Table 3), all the variables are stationary only at first difference and the probability coefficient of the variables is less than the critical value of 0.05 at a 5 percent level of significance. This implies that the null hypotheses are rejected.

Model Selection

To determine the best model to employ in the ARDL model, the study proceeds to evaluate various shorten model and select the best, upon which other models will be built. In light of this, the study presents the following;

Diagnostic Test (Hausman Test)

Table 4:Test Between the Fixed and the Random Effect

Effects Test	Statistic	d.f.	Prob.
Redundant Fixed Effects Tests			
Cross-section F	23.584274	(13,137)	0.0000
Cross-section Chi-square	180.939580	13	0.0000
Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.090485	3	0.5538

The question of which model is more appropriate FEM or REM is very difficult to answer. Judge *et al.*, (1980) made a few suggestions that are related to the context of the data, and its environment besides the correlation between error component and regressions. If it is assumed to be uncorrelated, random effects may be appropriate, whereas if correlated, fixed effects are unbiased and then are more appropriate. The Hausman (1978) specification test can be used to determine the appropriate method either fixed or random-effects models. However, econometricians seem to be united generally that the random-effects model is more appropriate to be used if individual intercepts are drawn randomly from a large population. By contrast, the FEM is more appropriate in the case of focusing on specific sets of the firms. An important test for model specifications is to decide whether the FEM or REM is more appropriate (Maddala, 2001).

The null hypothesis is that the residuals in the random effects (REM) are uncorrelated with the regressions and that the model is correctly specified. From the table above, the fixed effects on the cross-section Redundant Fixed Effect- Likelihood Ratio, the P-value is 0.5538 indicating that the effects are not significant. Select the random effect and perform the Correlated Random Effects- Hausman test, testing the random effects model against the fixed effects model. The null hypothesis, in that case, is that both tests are consistent estimators and the random-effects model is efficient. Under the alternative hypothesis, only the fixed effect is consistent. Since the p-value is 0.5538, the null hypothesis is not rejected and, therefore, the random-effects model is to be preferred.

Pooled Effects regression

To evaluate for joint influence of employed variables on the criterion, the table above which represents the pooled effect shows that;

Table 5: Multiple Regression Result of Pooled Effect Model at OLS

Variables	Coefficient	Std. Error	t. Statistic	Prob.
C	22.92103	2.409174	9.514063	0.0000
GRI	0.045065	0.030826	1.461883	0.1459
GIN	0.036950	0.030701	1.203546	0.2307
GAC	-0.081062	0.081436	-0.995407	0.3211
EXS	0.884159	0.803837	1.099924	0.3517
EAQ	0.058262	0.066098	0.881443	0.3783

R^2 = 0.024863, Adj R^2 = 0.005360;

DW = 0.503906

Fixed Effect Regressions (Model 1)

To deal with the issues of heterogeneity bias, the fixed effect is carried out as follows:

Table 6: Multiple Regression Result of Fixed Effect Model at OLS

Variables	Coefficient	Std. Error	t. Statistic	Prob.
C	28.26224	1.748947	16.15957	0.0000
GRI	-0.018654	0.041808	-0.446176	0.6562
GIN	-0.044538	0.027103	-1.643246	0.1026
GAC	-0.042501	0.065084	-0.653020	0.5148
EXS	-0.004412	0.010670	-0.413533	0.6793
EAQ	-0.716216	0.511756	-1.399528	0.1620

R^2 = 0.776454, **Adj R^2** = -0.7118875; **DW** =2.086667

Random Effects Model

The random effect model is carried out below as follows;

Table 7: Multiple Regression Result of Random Effect model at OLS

Variables	Coefficient	Std. Error	t. Statistic	Prob.
C	28.05679	3.595348	7.803638	0.0000
GRI	-0.016749	0.036983	-0.452875	0.6513
GIN	-0.040779	0.025320	-1.610550	0.1094
GAC	-0.044660	0.063864	-0.699301	0.4854
EXS	-0.001733	0.013769	-0.125881	0.8999
EAQ	-0.300345	0.495747	-0.605844	0.5448

R^2 = 0.723030, Adj R^2 = 0.703490; DW = 1.842917

The output of Hausman test (see appendix) and table 7 above indicates that p-value of 0.6152 > 0.05 significant level and on this basis, we do not reject hypothesis that random effect model is more preferred than fixed-effect model in carrying out analysis on the impact of the predictor variables (GRI, GIN, & GAC) on the criterion variable (TBQ). From the random effect estimation output on table 4.20, the regression of TBQ on GRI, GIN, And GAC respectively indicated that an intercept of 28.05679 which suggests that average level TBQ is 28.05679 when the independent variables (GRI, GIN, And GAC) are zero. GRI, GIN, And GAC have negative relation in a gradient of -0.016749, -0.040779, -0.044660, -0.001733, and -0.300345 and their probability values are not statistically significant at 0.05 level of significance. The negative coefficients of the independent variables mean that any unit upsurge in them reduces the average level of TBQ by 0.016749, 0.040779, 0.044660, and 0.001733, and 0.300345 respectively. In the same manner, units decline in TBQ increases GRI, GIN, And GAC respectively. Furthermore, the coefficient of determination from the regression analysis on table 4.5 is 72.3 percent which implies that 72.3 variations in TBQ are explained by the predictor variables.

Table 8: Fixed and Random Effect Comparison

Variable	Fixed	Random	Var(Diff.)	Prob.
GRI	-0.018654	-0.016749	0.000380	0.9222
GIN	-0.044538	-0.040779	0.000094	0.6975

GAC	-0.042501 -0.004412	-0.044660 -0.001733	0.000157	0.8633
EXS	-0.716216	-0.300345	0.006311	0.7541
EAQ			0.008548	0.1538

Table 8 unveils the variance difference among the study variables; the variables are all statistically not significant in the three models. This implies that there is a statistical difference between the fixed and the random effect models for the independent variables as formulated in the regression model.

Panel Cointegration test

The study proceeds to test for the nature of long run relationship using the random effect progressively.

Table 9 Pedroni Residual Cointegration Test

Series: TBQ GRI GIN GAC

			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	-1.617353	0.9471	-2.181428	0.9854
Panel rho-Statistic	1.609804	0.9463	1.305844	0.9042
Panel PP-Statistic	-4.434431	0.0000	-4.975363	0.0000
Panel ADF-Statistic	-5.314670	0.0000	-5.834179	0.0000
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	2.972578	0.9985		
Group PP-Statistic	-6.443721	0.0000		
Group ADF-Statistic	-7.030727	0.0000		

The evidence from the table 9 shows that the panel cointegration test found the existence of a long-run relationship with the probability values of ADF and PP which are less than 0.05 level of significance, we, therefore, reject the null hypothesis of no cointegration but we do not reject the alternative hypothesis of a long-run relationship.

Error Correction Mechanism Test

The error correction model is a statistical relationship that demonstrates the speed of adjustment, i.e. the rate at which the dependent variable adjusts to changes in the independent variables. The study consequently tests for the speed of adjustment using the short-run dynamism of error correction model (ECM).

Table 10: Vector Error Correction Estimate

Cointegrating Eq:	CointEq1
TBQ(-1)	1.000000
GRI(-1)	-0.531161 (0.15220) [-3.48997]
GIN(-1)	-0.706428 (0.15325) [-4.60951]
GAC(-1)	-0.676355

	(0.47481)
	[-1.42448]
EXS(-1)	-0.231281
	(0.034496)
	[-6.704511]
EAQ(-1)	-0.416139
	(0.187736)
	[-2.216620]
C	25.49990

The evidence from the table 10 above revealed that a one percent change in green investment (GRI), Green initiative (GIN), and green activities (GAC) will result to 0.531161, 0.706428, and 0.676355percent decrease in changes in Tobin Q (TBQ).

Table 11: Extract of Error Correction Model Results
$TBQ_{it} = f(GRI_{it}, GIN_{it}, GAC_{it}, EXS_{it}, EAQ_{it},)$

Variables	Coefficient	Standard Error	T-Statistics	Probability Value
ECM(-1)	-0.060657	0.028924	-2.097142	0.0366
D(TBQ(-1))	-0.531073	0.090032	-5.898698	0.0000
D(TBQ(-2))	-0.410175	0.083027	-4.940273	0.0000
D(GRI(-1))	0.013686	0.048350	0.283067	0.7773
D(GRI(-2))	0.048871	0.043708	1.118134	0.2642
D(GIN(-1))	-0.014455	0.041532	-0.348046	0.7280
D(GIN(-2))	-0.134746	0.038735	-3.478664	0.0006
D(GAC(-1))	-0.116031	0.103245	-1.123842	0.2617
D(GAC(-2))	-0.130702	0.079966	-1.634476	0.1029
D(EXS(-1))	-0.231281	0.034496	-6.704511	0.0000
D(EXS(-2))	0.166079	0.053734	3.090763	0.0021
D(EAQ(-1))	0.029593	0.000939	31.52919	0.0001
D(EAQ(-2))	-0.076458	0.044854	-1.704605	0.0886
C	-0.408096	0.658085	-0.620126	0.5355

From the table 11 above, the ECM (-1) test is negative with a coefficient value of -0.060657. The speed of adjustment (Lambdha) from the short run disequilibrium or dynamics to its long-run equilibrium is only 6.06 percent and statistically significant at 5 percent level of significance since its probability value is 0.0366 < 0.05. The coefficients of current and past (lag 1 & 2) values of GRI are positive, suggesting that an increase in GRI results to increase in TBQ and their t-values are insignificant at 5 percent level of significance. The coefficients of current and past (lag 1 & 2) of GIN are negative indicating that increase in GIN results to decrease in TBQ at the same proportion but their t-value at lag 1 is statistically insignificant at 5 percent level of significance while their t-value at lag 2 is statistically significant since the probability value of 0.0006 is less than 0.05 significant level. Once more, the coefficient of current and past (lag 1 & 2) of GAC and external audit dimensions (EXS and EAQ) are similarly negatively signed and their t-values are statistically insignificant at a 5 percent level. The implication is that as these variables increases, TBQ decreases at the same proportion.

Hypotheses Testing

Each of the four null hypothetical tests I based on same decision rule; we reject null hypothesis if p-value is less than 5% conventional level, otherwise we fail to reject

H_{01}: There is no significant relationship between green investment and Tobin Q of quoted oil and gas firms in Nigeria.

From the analysis, the study observed that green investment has a positive and insignificant relationship with the Tobin Q of quoted oil and gas firms. The beta coefficient of 0.630137 as a parameter for green investment proved that a unit increase on the variable will lead to a 0.63 percent decrease in the Tobin Q of quoted oil and gas firms in Nigeria. However, the hypothesis formulated was tested using the t-statistics and the probability coefficient from the random effect model validated by the Hausman test. The t-statistics of 1.78362 is greater than the critical value of ± 1.98 at 9 degrees of freedom and the probability coefficient of 0.0621 is greater than the critical value of 0.05 at 5 percent level of significance which implies that there is no significant relationship between green investment and the Tobin Q of quoted oil and gas firms in Nigeria within the periods covered in this study. The insignificant effect of green investment on the Tobin Q of quoted industrial good firms in Nigeria implies that an increase or decrease in the variable will not have any meaningful effect on the dependent variable. Green investment can affect Tobin's Q in several ways. Tobin's Q measures the market value of a company relative to the replacement value of its assets. Green investments, which refer to investments in environmentally sustainable activities and initiatives, can increase the market value of a company in several ways.This viewpoint is in consonance with the empirical findings Uwaiwu and Jimoh (2018), Saman (2019; Okoye etal (2021)who justified that green investment significantly relate to Tobin's Q. It is also in tandem with the empirical findings of Nwaiwu and Joseph (2023) who concluded that there exist a positive and insignificant relationship between green investment and Tobin's Q of oil and gas firms in Nigeria.

H_{02}: Initiative does not significantly relate to Tobin's Q.

The study found in research question four and hypothesis indicated that there is a negative and insignificant relationship between green initiative and the Tobin Q of quoted oil and gas firms in Nigeria. The beta coefficient of 2.66311 as a parameter for green initiative proved evidence that a unit increase on the variable will result in a 2.6 percent increase in the Tobin Q of quoted oil and gas firms in Nigeria. The t-statistics of -2.66311 is greater than the critical value of ± 1.98 at 9 degrees of freedom and the probability coefficient of 0.0172 is less than the critical value of 0.05 at 5 percent level of significance which implies that there is significant relationship between green initiative and the Tobin Q of quoted oil and gas firms in Nigeria within the periods covered in this study. The significant effect of green initiative on the Tobin Q of quoted oil and gas firms in Nigeria implies that an increase or decrease in the variable will have a meaningful effect on the dependent variable. The negative effect of green initiative on the Tobin Q of quoted oil and gas firms in Nigeria is contrary to our a-priori expectations of the results as we expected a positive relationship between the variables. The empirical findings lent credence to the standpoint of Okafor (2018); Nwaiwu and Eluke (2018) who found that green initiative significantly relate to Tobin's Q of oil and gas firms in Nigeria.

H_{03}: There is no significant relationship between green activities and Tobin's Q

The objective of the seventh research question and hypothesis was to examine the relationship between green activities and the Tobin Q of quoted oil and gas firms in Nigeria. The regression coefficient found that green activities have a negative and insignificant relationship with Tobin Q in quoted oil and gas firms in Nigeria. The beta coefficient of -2.419852 as a parameter for green activities proved that a unit increase on the variable will lead to a 2.4 percent decrease in Tobin Q in quoted oil and gas firms in Nigeria. However, the hypothesis formulated was tested using the t-statistics and the probability coefficient from the random effect model and validated by the Hausman test. The t-statistics of 2.28036 is greater than the critical value of ± 1.98 at 9 degrees of freedom and the probability coefficient of 0.0374 is less than the critical value of 0.05 at 5 percent level of significance which implies that there is a significant relationship between green activities and the Tobin Q of quoted oil and gas firms in Nigeria within the periods covered in this study. The significant effect of green activities on discretional accruals management in quoted oil and gas firms in Nigeria implies that an increase or decrease in the variable will have meaningful effect on the dependent variable. However, their empirical findings discussed were not in conformity with results of Maama and Appiah (2019) who concluded that there is a strong positive and significant relationship between green activities and performance metric measured with Tobin's Q of oil and gas firms in Nigeria.

Conclusions and Recommendations

The present research study has empirically investigated green accounting components and how they affect financial performance of quoted oil and gas firm using cross-sectional data of six (6) quoted oil and gas firms for a period of 11 years. The criterion variable was proxied by Tobin Q, while the predictor variables were proxied by green investment (GRI), Green initiative (GIN), green activities (GAC), external audit committee size/presence (EXS), and external audit quality (EAQ). Nine hypotheses were postulated in this research study. Consequently, based on the test of the hypotheses, the following conclusions are drawn:

i. There is a positive and insignificant influence of green investments on the Tobin Q of oil and gas firms in Nigeria.
ii. A positive and significant relationship is observed between green initiative and Tobin Q in oil and gas firms in Nigeria.
iii. Green activities have a negative and significant effect on the Tobin Q of oil and gas firms in Nigeria.

Based on the findings from this research study, the following recommendations are proffered:

i. A sustainability strategy that aligns with the company's overall business strategy can help identify opportunities for green investments that can improve financial performance. The strategy should cover all aspects of the business, from supply chain to operations to product development.
ii. Involve stakeholders, including investors, employees, customers, and community members, in the decision-making process for green investments. This will help ensure that the investments are aligned with stakeholder interests and values.
iii. Monitor and measure impact: Implement a robust monitoring and reporting system to track the impact of green investments on financial and non-financial performance. This will help the company identify areas for improvement and demonstrate the value of green investments to stakeholders.
iv. Communicate effectively: Effective communication of the company's sustainability strategy and green investments can help enhance the company's reputation and attract environmentally conscious investors and customers.

Limitation and suggestion for further Studies

This study is limited to listed oil and gas firms. Therefore, the findings are only applicable to then and not to other firms that are not quoted. In order words, the finings in this study could only be generalized to listed oil and gas so covered. Moreover, the study used Tobin's Q while the independent variable used are green initiative, green activities and green investment management for a period of 11 years spanning from 2012-2022. Hence, further empirical studies should be conducted using both primary and secondary data.

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