International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2024, 14(5), 98-108.

Nexus between Returns on Equity and Disclosures of Greenhouse Gas Emissions, Waste Management, and Renewable Energy

Yinka Lydia Emmanuel[1], Oluwasikemi Janet Owolabi[2], Babatunde Ayodeji Owolabi[3], Jerry D. Kwarbai[3], James Olalekan Akinbode[4], Sunday Festus Olasupo[1], Isiaka Olayinka Kolawole[5], Adegbola Olubukola Otekunrin[1]*

[1]Department of Accounting and Finance, Bowen University, Nigeria, [2]Pan-Atlantic University, Lagos State, Nigeria, [3]Department of Accounting, Babcock University, Nigeria, [4]Department of Business Administration, Bowen University, Iwo, Osun State, Nigeria, [5]Department of Economics, Federal University Lokoja, Kogi State, Nigeria. *Email: adegbola.otekunrin@bowen.edu.ng

Received: 19 March 2024 **Accepted:** 05 July 2024 **DOI:** https://doi.org/10.32479/ijeep.16254

ABSTRACT

Environmental sustainability is now being continuously researched in almost all areas of humankind. This study investigated the impact of environmental sustainability disclosures (proxy by renewable energy disclosures, Greenhouse gas emissions disclosures, and waste management disclosures) on the returns on equity of sampled Quoted Nigerian Financial Institutions. Purposely, Fourteen Quoted Nigerian Financial Institutions on the Nigerian Exchange Group were taken as the sample size for this study. The study spanned a period of 9 years from 2013 to 2021. The analysis was carried out using panel data and employing multiple regression models to assess the relationships between the variables using secondary data collated from the annual reports of Quoted Nigerian Financial Institutions. The findings of the study reveal that the impact of renewable energy disclosures (with coefficient estimate = −0.19295, t = −1.41 and P = 0.16), Greenhouse gas emissions disclosures (with coefficient estimate = −0.16105 and the t = −1.18 P = 0.239, and waste management disclosures (with coefficient estimate = 0.124013, the t = 1 and P = 0.317) on returns on equity is not significant. This study concluded that the relationship between return on equity and environmental sustainability variables disclosures (proxy by Renewable Energy Disclosure and Greenhouse Gas Emissions) are not related.

Keywords: Sustainability, Environmental, Renewable, Energy, Greenhouse, Gas, Emissions
JEL Classifications: Q51, Q16, C22, C1, C20

1. INTRODUCTION

Human activity has increased the risk of global warming, which has increased atmospheric Greenhouse Gas Emissions. The threat that greenhouse gas emissions pose to sustainable development has made it an important subject of research and a worldwide phenomenon (Azam et al., 2022). It is extremely dangerous for both the environment and human welfare. Greenhouse Gas Emissions are a major contributing factor to the world's environmental issues. Greenhouse Gas Emissions have been the main cause of serious environmental contamination, which has an impact on human life irrespective of economic progress. Urbanization and industrialization have contributed to the significant expansion of the global economy during the last few decades. According to Nasim et al. (2023), a significant number of economies depend on fossil fuels as their primary energy source due to the growing effects of industrialization and urbanization, both of which worsen the environment and cause global warming. Stakeholders like shareholders, customers, and government agencies have begun to put pressure on businesses to reduce their greenhouse gas emissions in recent years (Helfaya et al., 2019). As a result, businesses will probably be essential in helping to stabilize climate change by lowering their GHGE emissions (Luo, 2019). In response to pertinent stakeholders'

concerns, businesses have been asked to provide disclosure about their climate change-related activities—also known as Greenhouse Gas Emissions disclosures in recent years (Li et al., 2018). In Nigeria, Greenhouse Gas Emissions reporting is not mandatory. To assist businesses in disclosing to their stakeholders about their climate change initiatives, the study of Greenhouse Gas Emissions disclosure has grown in significance in the past few years (Uyar et al., 2020). Smarter decisions regarding investments can be made by stakeholders, including creditors and shareholders, with the aid of these disclosures. In addition to improving a company's Greenhouse Gas Emissions performance, Greenhouse Gas Emissions disclosure can assist stakeholders including institutional investors, regulatory bodies, and the general public in better monitoring and controlling a company's Greenhouse Gas Emissions. The financial success of the company may be impacted by enhanced environmental performance which includes Greenhouse Gas Emissions, renewable energy, and waste management disclosure (Rahmawati et al., 2024).

Studies have looked into this problem in the financial sector, despite the significance of Greenhouse Gas Emissions disclosure globally, and the importance of return on equity to the equity holders, and the results of those studies have been inconsistent (Luo, 2019). This research adds to the body of literature by reexamining the connections between return on equity and Greenhouse Gas Emissions disclosure in a sample of Quoted Nigerian Financial Institutions. In Quoted Nigerian Financial Institutions, maintaining energy efficiency is crucial because their energy usage continues to be steadily rising (Borgstein and Lamberts, 2014; Borgstein et al., 2017). It is crucial, then, to set up projects that look into energy supply, security, usage, and usage levels, as well as how energy affects Quoted Nigerian Financial Institutions operations (Nduka, 2021). For this reason, in hopes of attaining a considerable reduction in the amount of energy that Quoted Nigerian Financial Institutions consume, the real energy consumption beyond office hours as well as the tracking of the energy rates of electric devices employed by Quoted Nigerian Financial Institutions have to be examined (Ganda and Ngwakwe, 2014). Quoted Nigerian Financial Institutions have implemented some strategies, including training employees on energy-saving techniques, creating a standard Quoted Nigerian Financial Institutions philosophy that is more environmentally friendly, installing environmentally friendly technologies, and maintaining complete transparency. These strategies are crucial for ensuring the sustainability of energy in the sector (RBS 2015). In addition, Quoted Nigerian Financial Institutions have additionally provided contributions to finance for environmental projects by providing energy-efficient mortgages and loans to customers who want to upgrade to basic green financial instruments and systems. Quoted Nigerian Financial Institutions appear to have burned their fingers in previous years and are just now realizing the benefits of energy saving. Given these perspectives, it's critical to evaluate the degree of energy sustainability and how it affects the operation of Quoted Nigerian Financial Institutions. Today it is clear from the aforementioned investment in renewable energy that the Quoted Nigerian Financial Institutions have been bearing a disproportionate share of the costs associated with maintaining a sizable branch network throughout the nation. Examining the degree of energy sustainability and how it affects the functioning of Quoted Nigerian Financial Institutions is crucial in light of these opinions. This research adds to the body of literature by reexamining the connections between return on equity and renewable energy, Greenhouse Gas Emissions, and waste management disclosures in a sample of Quoted Nigerian Financial Institutions.

2. LITERATURE REVIEW AND FORMULATION OF HYPOTHESIS

2.1. Review of Related Concepts

2.1.1. Returns on equity (ROE)

The profitability of a company concerning equity is evaluated by return on equity (ROE). In essence, the ratio calculates the rate of return that a firm's ordinary shareholders receive on their investment. It shows how well the business is doing at earning returns on the capital that its shareholders have invested in it. Rappaport (1986) opined that one of the most popular and possibly most extensively utilized measures of corporate financial success overall is ROE. Any firm that seeks to maximize profits must ultimately aim to enrich its shareholders. The creation of shareholder value occurs when a company's equity returns surpass the expense of its equity (Black and Wiliam, 2001). Alternative terminology for it is the present value of all future cash flows less interest paid. By dividing the earnings after tax and preference dividends of a certain year by the book value of ordinary shares at the start of the year, one can compute return on equity. These days, all stakeholders with an interest in the company are taken into consideration while running a firm, not only stockholders. In light of this, businesses that uphold their economic principles should also acknowledge in their annual reports the social and environmental effects of their operations on the host communities to safeguard the environment, foster peaceful coexistence, protect the organization's reputation, and foster public trust. In light of this, the study's objective is to determine how environmental accounting disclosures such as disclosures of greenhouse gas emissions, waste management, and renewable energy affect a subset of Quoted Nigerian Financial Institutions' return on equity.

2.1.2. Environmental performance

Environmental performance demonstrates how accountable the corporation is for preserving the natural environment in which it conducts business. If the business also follows the rules to preserve the surrounding environment at the location of operation, it will establish a positive social bond between the environment and the organization. A company having a direct connection to the environment might rank the firm's environmental performance to determine its level of sustainability compliance. A corporation that scores well indicates that it complies well with environmental regulations. Conversely, a low compliance rating indicates a low level of compliance for the organization. Companies are encouraged to declare their greenhouse gas emissions when their compliance grade is greater (Rohmah and Nazir, 2022; Pratiwi et al., 2019). In line with the legitimacy concept, this holds that businesses reveal their environmental responsibilities as a means of determining legality. Companies that do well might be encouraged to disclose their greenhouse gas emissions

and to publicize their environmental initiatives. This is done to demonstrate to the general public that the corporation abides by social conventions and principles (Aini et al., 2022). Profitable businesses will supply adequate resources for financing the disclosure of greenhouse gas emissions, according to a study done by Hidayah et al. (2019). Conversely, less profitable businesses tend to be less concerned with revealing greenhouse gas emissions since they are more concerned with boosting corporate profits and will impose restrictions on sharing carbon data (Luo et al., 2012; Dewayani and Ratnadi, 2021; Saptiwi, 2019; Septriyawati and Anisah, 201). The financial success of the company concerning environmental performance may be impacted by enhanced environmental performance which includes Greenhouse Gas Emissions, renewable energy, and waste management disclosure (Emmanuel et al., 2024; Emmanuel et al., 2023).

2.1.3. Global reporting initiatives

Environmental sustainability reporting is a subset of sustainability reporting that addresses how organizations affect both living and non-living natural systems, including ecosystems, the land, the air, and the water, according to Global Reporting Initiatives (2011). greenhouse gas emissions, products and services, waste management, biodiversity, water, energy, materials, compliance, transportation, total money spent on protecting the environment, vendors' evaluation of the environment, and environmental dispute procedure are the 12 sub-divisions for environmental performance indicators identified by GRI. The mediating role that environmental sustainability plays in the return on equity of Quoted Nigerian Financial Institutions will be the main subject of this study. Despite the extensive literature on environmental sustainability, there is a notable gap in the research when it comes to specifically examining the relationship between return on equity and environmental sustainability in Quoted Nigerian Financial Institutions. Sustainability initiative refers to the conscious and proactive efforts of individuals, organizations, or communities to promote and achieve sustainable practices and outcomes. Sustainability initiatives can undertake a wide range of activities such as verifying sources, reducing greenhouse gases, conserving water, and energy, promoting recycling and waste reduction, fair trade and ethical sourcing, promoting social equity and inclusion, and promoting responsible consumption and diversity. The goal of the Sustainability Initiative is to a stable and harmonious relationship between humans and the planet, ensuring that future generations can thrive in a healthy and balanced environment.

2.1.4. Environmental sustainability

The ability to preserve the well-being and vibrancy of the natural environment across an extended period is referred to as environmental sustainability. It involves meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. Environmental sustainability initiatives focus on protecting and preserving natural resources, minimizing pollution and waste, conserving biodiversity, and mitigating the impacts of human activities on ecosystems. Reporting on environmental sustainability is a critical tool for increasing openness and educating stakeholders about an organization's long-term, and short-term environmental initiatives and practices (Comyns, 2016; Perrault and Clark 2016; Chang et al. 2018; Oh et al., 2011). Environmental sustainability disclosure refers to the practice of companies providing transparent and comprehensive information about their environmental performance, initiatives, and impacts. It involves publicly disclosing data, strategies, goals, and progress related to environmental sustainability practices and initiatives. Oyekale et al. (2022) defined environmental sustainability disclosure as the practice of reporting the impacts of a company's activities on its operating environment. They also argued the implications of environmental sustainability disclosure for various stakeholders and recommended that management should institute sound corporate governance mechanisms to enable improved environmental sustainability practices and their disclosure. The purpose of corporate environmental sustainability disclosure is to enhance accountability, foster stakeholder trust, and drive positive change in corporate environmental practices. By disclosing relevant information, companies can demonstrate their commitment to environmental stewardship, enable stakeholders to make informed decisions, and encourage continuous improvement in environmental performance

2.1.5. Measures of environmental sustainability disclosures

2.1.5.1. Greenhouse gas emissions

Companies may disclose their greenhouse gas (GHGE) emissions, including direct emissions from company-owned sources (i.e. Scope 1), indirect emissions from purchased electricity (i.e. Scope 2), and indirect emissions from the value chain (i.e. Scope 3). GHGE emissions disclosures help stakeholders assess a company's contribution to climate change and its efforts to reduce greenhouse gas emissions. Financial Institutions can benefit from greenhouse gas emissions disclosure by gaining legitimacy from stakeholders, preventing threats, reducing operational costs, increased corporate transparency and accountability which also reduce reputational risk (Berthelot and Robert, 2011). The cost of disclosing greenhouse gas emissions can be seen as a long-term investment benefit that increases stakeholder confidence in the banks and improves the company's return on equity (Marietza and Hatta, 2021). With carbon accounting, which entails computation, reporting, and creating strategies to reduce greenhouse gas emissions, banks can control their greenhouse gas emissions and lessen their greenhouse gas emissions footprint. Lowering fuel use, using fewer generators, and encouraging online meetings to cut down on travel are some tactics for cutting greenhouse gas emissions. Quoted Nigerian Financial Institutions are not behind other institutions in revealing their role in lowering greenhouse gas emissions. Thus, one of the objectives of this study is to establish whether returns on equity in Quoted Nigerian Financial Institutions and the publishing of greenhouse gas emissions are related. The hypothesis in a null form that this study examined, along with an explanation of how they relate to the literature that has been studied is as given below:

$H0_1$: Returns on equity in Quoted Nigerian Financial Institutions, and disclosure of greenhouse gas emissions are not related

2.1.5.2. Waste management disclosure

Companies may disclose their waste generation and management practices, including the types of waste produced, recycling rates, waste reduction initiatives, and efforts to minimize hazardous waste. This information provides insights into a

company's commitment to responsible waste management and circular economy principles. In the modern era, there has been a significant emphasis on solid waste management, particularly in the development of public health and environmental policies (Okoli et al., 2020). This is driven by the urgent need to address the increasing volume and diversity of solid and hazardous waste generated as a result of ongoing economic growth, urbanization, and industrialization. To tackle this issue, the Federal Environment Protection Agency (FEPA) was established in 1988 in Nigeria to oversee waste management concerns (Maiyaki et al., 2019). This agency provides guidelines for the adoption of effective waste management practices in various settings, including households, businesses, and organizations. Waste management approaches have shifted towards more sustainable practices, prioritizing activities such as waste reduction, sorting, reuse, recycling, and energy recovery, as alternatives to traditional methods like landfilling, open storage, and open incineration. These newer approaches are more environmentally friendly and inclusive, with fewer adverse impacts on human health and the environment (Abubakar et al., 2022). Notably, many Financial Institutions have taken proactive measures to disclose their waste management practices, including waste reduction, reuse, and recycling, in their day-to-day operations. Examples include reducing paper consumption through online banking, implementing waste sorting systems, and promoting the reuse and recycling of waste materials among their employees and customers. According to Mubaslat (2021), waste refers to any substance, whether in solid, liquid, or gaseous form, that is disposed of through methods like recycling, burning, or incineration. It encompasses materials that result from manufacturing processes or commercial products that have become obsolete and no longer serve their intended purpose. Waste is often synonymous with terms like trash, garbage, or waste, and it includes any material or by-product that is discarded because it is no longer useful or needed after a certain process is completed. Waste can exist in liquid or solid form, and it may also possess hazardous characteristics or be eligible for recycling. As the population grows and the demand for essential resources like food increases, there is a corresponding rise in waste generation. Consequently, it becomes crucial to implement effective waste management practices in our daily operations. Quoted Nigerian Financial Institutions have made their waste management strategies public. These strategies include encouraging staff and clients to sort, reuse, and recycle their garbage and lowering paper usage through Internet banking. Therefore, another purpose of this study is to determine whether waste management disclosure and Quoted Nigerian Financial Institutions equity returns in Nigeria are related. The second hypothesis, which was investigated in this work and has links to the researched literature, is now presented in null forms as follows:

$H0_2$: Returns on equity, and disclosure of waste management in the Quoted Nigerian Financial Institutions are not related

2.1.5.3. Renewable energy disclosure

Renewable energy disclosure involves reporting and disclosing information about a company's use of renewable energy sources in its operations. It includes providing data on the proportion of energy consumed that comes from renewable sources, such as solar, wind, hydroelectric, biomass, or geothermal energy. Renewable energy disclosures demonstrate a company's commitment to reducing greenhouse gas emissions, combating climate change, and transitioning to a more sustainable energy mix. In recent years, the growth of renewable energy has been fueled by government-sponsored projects such as tax reductions and subsidies which have reduced energy production costs leading to cost competitiveness. Renewable energy initiatives have been established in many nations namely, the United States, Africa, Europe, Latin America, and Asia. This initiative has created renewable energy technology installers and emerging manufacturers (Shahbaz et al., 2020). As the demand for energy sustainability increases, renewable energy technologies have become promising energy sources. The most common sources of renewable energy are solar and wind because they are ubiquitous and freely available (Zhou et al., 2010). It is also a clean energy source that does not emit greenhouse gases. However, the initial cost of these renewable energy systems is much higher than that of conventional power generation systems. Furthermore, these renewable resources are intermittent as they are highly dependent on weather conditions (Banos et al., 2011). These renewable energy sources, which include solar and wind energy can be adopted by Quoted Nigerian Financial Institutions that are powered by solar power plants, energy star-rated light fixtures, and motion sensors in the conduct of their day-to-day operations. Various Quoted Nigerian Financial Institutions have indicated in their annual report how their ATMs were powered by solar power plants to promote the smooth operations of their customers and also ensure the proper use of LED bulbs and motion sensors in their banking facilities. Therefore, one of the purposes of this study is to investigate whether the disclosure of renewable energy and the returns on equity in Quoted Nigerian Financial Institutions are related. The third hypothesis of the investigation has been presented in null styles, with references to the literature that has been studied:

$H0_3$: Returns on equity, and disclosures of renewable energy in Quoted Nigerian Financial Institutions are not related

2.2. Theoretical Underpinning

2.2.1. Stakeholder theory

Stakeholder theory is a theoretical framework that has gained prominence in recent years as a means of analyzing the relationships between organizations and their various stakeholders. According to the notion, people or organizations with an interest in a company's achievements and operations are considered stakeholders. This can include employees, customers, suppliers, shareholders, the local community, and the environment. Stakeholder theory is concerned with understanding how organizations interact with their stakeholders and how these interactions ultimately affect organizational behavior and performance. Stakeholder theory was first developed to support companies' social obligations and to assert that managers have moral obligations to stakeholders besides those related to finance (Hendry, 2001). Stakeholder theory is a valuable tool for organizations seeking to understand and manage their relationships with their various stakeholders. By identifying and prioritizing stakeholder interests, organizations can develop strategies for building positive relationships and achieving long-term success and sustainability. According to Dzomonda (2022), a stakeholder is defined under the theory as a person or an organization whose interests could be influenced by the way

the firm operates. As a result, different stakeholders might require regular updates on how a business is operating daily to make sure their needs are being met. Moreover, the COVID-19 pandemic has highlighted the importance of stakeholder theory. Companies that prioritized the health and safety of their employees, supported their suppliers, and contributed to their communities have been seen as more resilient and better equipped to navigate the crisis. In terms of how stakeholder theory is explained in the literature, this study embraces, and adopts the stakeholder theory.

2.2.2. Signaling theory

Signaling theory is a branch of economics that studies how information is conveyed between individuals and organizations. It is a valuable framework that explains how individuals and organizations signal their productivity, potential, and other characteristics to others. In this essay, we will explore the history of signaling theory, its key concepts, its applications, and its limitations. The concept of signaling theory can be traced back to the work of Michael Spence, who first proposed the theory in 1973. Spence's theory focused on the role of education as a signal of an individual's productivity and potential in the labor market. According to Spence, individuals who invest in education can signal their high productivity to employers, who are then willing to pay them higher wages. It contends that in cases of this kind of information asymmetry, the party in possession of more information needs to "signal" or communicate that information to others. It follows that businesses want to set themselves apart from competitors when it comes to performance through this kind of signaling. Mostly drawing from Akerlof's groundbreaking research (1970), Spence first proposed the notion of signaling in 1973. In his groundbreaking study on labor markets, Spence (1973) described the actions that a job candidate may take to lessen information asymmetry, which impairs the ability of prospective employers to make an informed decision. Spence (2002) asserted that minimizing information asymmetry between two parties is the main goal of signaling theory. Disclosures of greenhouse gas emissions, waste management, and renewable energy are to minimize information asymmetry between companies and their stakeholders. In terms of how signaling theory is explained in the literature, this study embraces, and adopts the signaling theory.

2.2.3. Legitimacy theory

Legitimacy theory is a sociological theory that explains how organizations legitimize their actions in the eyes of their stakeholders and society at large. Legitimacy is the perception that an organization's actions are desirable, proper, or appropriate within the context of the society in which it operates. Therefore, legitimacy theory posits that organizations must maintain the perception of legitimacy to ensure their survival and success in the long run. The legitimacy theory is a valuable framework for understanding how organizations interact with their environment and stakeholders. By maintaining the perception of legitimacy, organizations can build trust and support from the society in which they operate. However, the theory also acknowledges that legitimacy is a dynamic and subjective concept that can change over time, emphasizing the importance of continuous adaptation and responsiveness to societal expectations. The theory has been applied to many different fields, highlighting its versatility and relevance to a wide range of organizational contexts. Legitimacy theory and stakeholder theory are two concepts in corporate governance. Legitimacy theory suggests that organizations should operate within societal norms and ensure that their actions are perceived as legitimate by society. It is concerned with society. On the other hand, stakeholder theory focuses on specific stakeholders who have a link with the activities of the organization. It suggests that organizations should consider the interests of all stakeholders in their decision-making process (Elsayih et al., 2021). Legitimacy theory has been widely used in empirical studies to understand various phenomena related to organizational behavior, such as corporate social responsibility (CSR), environmental reporting, and stakeholder engagement. This theory assumes that organizations operate in a social context, where they need to maintain legitimacy to ensure their survival and success. In other words, organizations need to demonstrate that they are acting by societal norms and values to gain support and acceptance from their stakeholders. The foundation of this relationship is the idea that it encourages businesses to increase their objectivity, truthfulness, accountability, and openness (Oyekale et al., 2022). In terms of how legitimacy theory is explained in the literature, this study embraces, and adopts the legitimacy theory.

3. METHODOLOGY

In this study, secondary data was gathered from these Quoted Nigerian Financial Institutions from their published annual reports and for a period of 9 years that is from 2013 to 2021. The year 2013 was chosen as the base year because the Bankers' Committee at its retreat on July 14, 2012, approved the adoption of Nigeria's sustainable principles by various institutions. The adoption of Nigeria's sustainable principles by various institutions is of great benefit as it aims to help these institutions achieve their Environmental, Social, and Governance (ESG) goals. In other words, Quoted Nigerian Financial Institutions have the responsibility and initiative to ensure the sustainability and operability of the institution into an unforeseeable future. Likewise, 2021 was considered appropriate as the ending year not only because it is the most recent year, but this study aims to cover the before and after effects of COVID-19, and 2021 to a very large extent, can be said to be reliable in forming a conclusion. Returns on Equity and environmental sustainability were measured by Renewable energy, Greenhouse Gas Emissions, and Waste Management. The model of the study was applied as follows.

Return on equity = f (Environmental sustainability) (i)

Return on equity = f (renewable energy, Greenhouse Gas Emissions, waste management) (ii)

Model Specification: A panel regression model was adapted as follows.

Model

$$ROE = \beta_0 + \beta_1 GHGE_{it} + \beta_2 RENG_{it} + \beta_3 WASM_{it} + \beta_4 COAGE_{it} + \beta_5 INNETPRO_{it} + \beta_6 lNTOTASS_{it} + \varepsilon_{it} \quad (iii)$$

Where;
Dependent variables

ROE = Return on equity

Independent variables

$GHGE_{it}$ = Greenhouse gas emissions in firm i at year t

$RENG_{it}$ = Renewable energy in firm i at year t

$WASM_{it}$ = Waste management in firm i at year t

Control variables

$COAGE_{it}$ = Company Age in firm i at year t

$INNETPRO_{it}$ = Log of net profit in firm i at year t

$lNTOTASS_{it}$ =Log of total asset in firm i at year t

β_1, β_2 β_3 β_4 β_5 and β_6 are the coefficient of the independent and control variables

β_0 is the regression constant

ε_{it} = Error term

4. RESULTS AND DUSCUSSION

4.1. Regression Analysis

The results of the regression analysis estimated with Return on Equity (ROE) as a dependent variable are presented in the section. The model is estimated using fixed effect regression as guided by the Hausman test result.

Objective 1: to assess the effect of Greenhouse Gas Emissions disclosure on the return on equity of Quoted Nigerian Financial Institutions.

4.1.1. Hausman test

Table 1 provides coefficient estimates, standard errors, and other statistics for the variables GHGE, COAGE, INNETPRO, and lNTOTASS in a regression model. For COAGE, the estimated coefficients are 0.0114823 (fe) and 0.0275079 (re), with a difference of 0.0088635 and a standard error of 0.028515. The estimated coefficients for lNTOTASS are 0.0380126 (fe) and 0.0857036 (re). The coefficient estimates for INNETPRO are 0.1287353 (fe) and 0.0801113 (re), with a difference of 0.0175140 and a standard error of 0.0347776. The difference between these coefficients is 0.0442790, with a standard error of 0.0867771. The difference between these coefficients is −0.0836505, with a standard error of 0.0068064. The estimated coefficients for GHGE are −0.2521377 (fe) and −0.0551761 (re). To test whether these differences in coefficients are systematic, a chi-squared test is conducted. The Chi-squared statistic is calculated to be 5.70, with a corresponding P = 0.0355. Since the P-value is greater than the typical significance level of 0.05, we fail to reject the null hypothesis that the difference in coefficients is not systematic. However, it's important to note that the matrix (V_b-V_B) is not positive definite, which can affect the accuracy of the test. In conclusion, the results suggest that the choice between fixed effects (fe) and random effects (re) models may lead to differences in coefficient estimates. However, the chi-squared test does not provide strong evidence of systematic differences. Further analysis and consideration of the model specification are necessary to better understand the relationships between the variables and the implications of these results.

4.1.2. Fixed effect regression of greenhouse gas emissions disclosure on return on equity

In Table 2, the coefficient estimate for GHGE is −0.16105, indicating a negative relationship with the ROE. However, the t = −1.18 suggests that this coefficient is not statistically significant, as the associated P = 0.239 exceeds the conventional threshold of 0.05. Moreover, the confidence interval (−0.43079-0.108695) encompasses zero, indicating that GHGE may not have a significant impact on the ROE. For the variable COAGE, the coefficient estimate is 0.028593. It suggests a positive relationship with the ROE. The t = 1.18 and the corresponding P = 0.241 fail to reach statistical significance. Similarly, the confidence interval (−0.01951-0.076693) includes zero, indicating that there may not be a significant relationship between COAGE and the ROE. On the other hand, the coefficient estimate for INNETPRO is 0.219846. This positive coefficient, coupled with a statistically significant t = 3.41 (P < 0.001), suggests a strong relationship between INNETPRO and the outcome variable (ROE). The confidence interval of (0.091888-0.347805) further supports the significance of INNETPRO, as it does not encompass zero. Regarding the lNTOTASS, the coefficient estimate is 0.229102, implying a positive association with the outcome variable (ROE). However, the t = 1.92 falls short of statistical significance, with a P = 0.058 that is close to but above the conventional threshold of 0.05. The confidence interval (−0.00783-0.466032) includes zero, indicating that the relationship between the lNTOTASS and the outcome variable (ROE) may not be statistically significant. Lastly, the constant term (_cons) has a coefficient estimate of −10.1964. This value represents the intercept of the model. The associated t = −2.82 is statistically significant (P = 0.006), suggesting that the constant term has a significant impact on the outcome variable. Furthermore, the confidence interval (−17.3551-−3.03782) does not encompass zero, providing additional evidence of its significance. Based on the analysis of the coefficients, it appears that INNETPRO and the constant term (_cons) are statistically significant predictors of the outcome variable (ROE). On the other hand, GHGE, COAGE, and lNTOTASS do not demonstrate strong evidence of a significant relationship with outcome variable (ROE). Hence, the null hypothesis that returns on equity in Quoted Nigerian Financial Institutions, and disclosure of greenhouse gas emissions are not related is hereby accepted and the alternative hypothesis that returns on equity in Quoted Nigerian Financial Institutions, and disclosure of greenhouse gas emissions are related is rejected. This is dissimilar to Ofurum and Mmadubuobi's (2023) findings, using Nigerian Oil and Gas Firms.

Objective 2: to assess the effect of waste management disclosure on the return on equity of quoted nigerian financial institutions

4.1.3. Hausman test

Table 3 presents coefficient estimates, standard errors, and other statistics for the variables WASM, COAGE, INNETPRO, and lNTOTASS in a regression model. For COAGE, the coefficient

Table 1: Hausman test

ROE	(b) fe	(B) re	(b−B) difference	Sqrt (diag (V_b-V_B)) SE
GHGE	−0.2521377	−0.0551761	−0.0836505	0.0068064
COAGE	0.0114823	0.0275079	0.0088635	0.028515
INNETPRO	0.1287353	0.0801113	0.0175140	0.0347776
lNTOTASS	0.0380126	0.0857036	is 0.0442790	0.0867771

Source: Researcher's computation (2024). b: Consistent under Ho and Ha; obtained from xtreg.

Test: Ho: Difference in coefficients not systematic

Chi-square (4) = (b-B)'[(V_b-V_B)$^{(-1)}$](b-B)

=5.70

Prob>Chi-square=0.0355

(V_b-V_B is not positive definite)

B: Inconsistent under Ha, Efficient under Ho: Obtained from Xtreg, ROE: Return on equity, GHGE: Greenhouse Gas Emissions, COAGE: Company age, INNETPRO: Log of net profit, lNTOTASS: Log of total asset, fe: Fixed effects, re: Random effects, SE: Standard error

Table 2: Fixed effect regression of greenhouse gas emissions disclosure on return on equity

ROE	Coefficient	SE	t	P>|t|	95% CI
GHGE	−0.16105	0.136026	−1.18	0.239	−0.43079-0.108695
COAGE	0.028593	0.024256	1.18	0.241	−0.01951-0.076693
INNETPRO	0.219846	0.064527	3.41	0.001	0.091888-0.347805
lNTOTASS	0.229102	0.119478	1.92	0.058	−0.00783-0.466032
_cons	−10.1964	3.609926	−2.82	0.006	−17.3551-−3.03782
sigma_u	1.571302				
sigma_e	0.458536				
rho	0.921525	fraction of variance due to u_i			

Source: Researcher's Computation (2024). SE: Standard error, CI: Confidence interval, ROE: Return on equity, GHGE: Greenhouse gas emissions, COAGE: Company age, INNETPRO: Log of net profit, lNTOTASS: Log of total asset

Table 3: Hausman test

ROE	(b) fe	(B) re	(b−B) difference	sqrt (diag (V_b-V_B)) SE
WASM	0.0025313	0.0088446	−0.0071844	0.0025137
COAGE	−0.0038964	−0.0008256	−0.0047575	0.0026427
INNETPRO	0.0271652	0.0154623	0.0234568	0.003218
lNTOTASS	0.0235641	−0.0255567	0.0222322	0.0077385

Source: Researcher's Computation (2024). b: Consistent under Ho and Ha; obtained from Xtreg,

Test: Ho: Difference in coefficients not systematic

Chi-square (4) = (b-B)'[(V_b-V_B)$^{(-1)}$](b-B)

=10.16

Prob>Chi-square=0.0379

(V_b-V_B is not positive definite)

B: Inconsistent under Ha, efficient under Ho; obtained from Xtreg. WASM: Waste management, COAGE: Company age, INNETPRO: Log of net profit, lNTOTASS: Log of total asset, fe: Fixed effects, re: Random effects, SE: Standard error

estimates are −0.0038964 (fe) and −0.0008256 (re). The coefficient estimates for WASM are 0.0025313 (fe) and 0.0088446 (re). The difference between these coefficients is −0.0047575, with a standard error of 0.0026427. The coefficient estimates for INNETPRO are 0.0271652 (fe) and 0.0154623 (re). The difference between these coefficients is −0.0071844, with a standard error of 0.0025137. The difference between these coefficients is 0.0222322, with a standard error of 0.0077385. The difference between these coefficients is 0.0234568, with a standard error of 0.003218. Lastly, the coefficient estimates for the lNTOTASS are 0.0235641 (fe) and −0.0255567 (re). To test whether these differences in coefficients are systematic, a Chi-squared test is conducted. The chi-squared statistic is calculated to be 10.16, with a corresponding P = 0.0379. Since the P-value is greater than the typical significance level of 0.05, we fail to reject the null hypothesis that the difference in coefficients is not systematic. However, it's important to note that the matrix (V_b-V_B) is not positive definite, which can affect the accuracy of the test. In conclusion, the results suggest that the choice between fixed effects (fe) and random effects (re) models may lead to differences in coefficient estimates. However, the chi-squared test does not provide strong evidence of systematic differences. Further analysis and consideration of the model specification are necessary to better understand the relationships between the variables and the implications of these results.

4.1.4. Fixed effect regression of waste management disclosure on return on equity

In Table 4, the coefficient estimate for WASM is 0.124013, suggesting a positive relationship with the outcome variable. However, the t = 1 and the associated P = 0.317 indicate that this coefficient is not statistically significant. The confidence interval (−0.12082-0.368843) includes zero, further supporting the lack of statistical significance for WASM. For the variable COAGE, the coefficient estimate is 0.01922, indicating a

positive relationship with the ROE. However, the t = 0.8 and the corresponding P = 0.425 suggest that this coefficient is not statistically significant. The confidence interval (−0.02836-0.066802) includes zero, indicating that there is no significant relationship between COAGE and ROE. On the other hand, the coefficient estimate for INNETPRO is 0.210341. This positive coefficient, coupled with a statistically significant t = 3.23 (P = 0.002), suggests a strong relationship between INNETPRO and the ROE. The confidence interval of (0.081201-0.339481) further supports the significance of INNETPRO, as it does not encompass zero. Regarding lNTOTASS, the coefficient estimate is 0.190387, implying a positive association with the outcome. However, the t = 1.56 and the corresponding P = 0.122 indicate that this coefficient is not statistically significant. The confidence interval (−0.05158-0.432357) includes zero, suggesting that the relationship between lNTOTASS and the ROE may not be statistically significant. Lastly, the constant term (_cons) has a coefficient estimate of -9.05155. This value represents the intercept of the model. The associated t = −2.45 is statistically significant (P = 0.016), indicating that the constant term has a significant impact on the ROE. Moreover, the confidence interval (−16.372-−1.73115) does not include zero, providing further evidence of its significance. Based on the analysis of the coefficients, INNETPRO and the constant term (_cons) are statistically significant predictors of the ROE. However, WASM, COAGE, and lNTOTASS do not demonstrate strong evidence of a significant relationship with the ROE. Hence, the hypothesis that returns on equity in Quoted Nigerian Financial Institutions, and disclosure of waste management are not related is hereby accepted and the alternative hypothesis Returns on equity in Quoted Nigerian Financial Institutions, and disclosure of waste management are related is rejected because WASM has no statistically significant relationship with the ROE. This finding is in line with Okafor et al. (2024) findings using Nigerian Oil and Gas Firms.

Objective 3: to assess the effect of renewable energy disclosure on the return on equity of Quoted Nigerian Financial Institutions

4.1.5. Hausman test

Table 5 presents coefficient estimates, standard errors, differences between two sets of estimates (b and B), and associated statistics for a regression model with the variables RENG, COAGE, INNETPRO, and lNTOTASS. For the RENG variable, the coefficient estimate (b) is −0.0008063, while the alternative coefficient estimate (B) is 0.0068602. The difference between these estimates (b-B) is −0.0076665. The standard error for this difference is reported as 0.0022044. Regarding the COAGE variable, the coefficient estimate (b) is −0.0046629, and the alternative coefficient estimate (B) is −0.0007845. The difference between these estimates (b-B) is −0.0038783. The standard error for this difference is reported as 0.0018156. For the INNETPRO variable, the coefficient estimate (b) is 0.0393925, while the alternative coefficient estimate (B) is 0.0269188. The difference between these estimates (b - B) is 0.0124738. The standard error for this difference is reported as 0.0040497. Regarding the lNTOTASS variable, the coefficient estimate (b) is 0.0156407, while the alternative coefficient estimate (B) is -0.0184735. The difference between these estimates (b-B) is 0.0341142. The standard error for this difference is reported as 0.0091831. The table also provides the results of a chi-square test, which evaluates the systematic nature of the differences in coefficients. The test statistic chi2(4)

Table 4: Fixed effect regression of waste management disclosure on return on equity

ROE	Coefficient	SE	t	P>|t|	95% CI
WASM	0.124013	0.123462	1	0.317	−0.12082-0.368843
COAGE	0.01922	0.023994	0.8	0.425	−0.02836-0.066802
INNETPRO	0.210341	0.065122	3.23	0.002	0.081201-0.339481
lNTOTASS	0.190387	0.12202	1.56	0.122	−0.05158-0.432357
_cons	−9.05155	3.691507	−2.45	0.016	−16.372-−1.73115
sigma_u	1.423204				
sigma_e	0.459393				
Rho	0.90564	fraction of variance due to u_i			

Source: Researcher's Computation (2024). SE: Standard deviation, CI: Confidence interval, WASM: Waste management, COAGE: Company age, INNETPRO: Log of net profit, lNTOTASS: Log of total asset, ROE: Return on equity

Table 5: Hausman test

ROE	(b) fe	(B) re	(b−B) difference	sqrt (diag (V_b-V_B)) SE
RENG	−0.0008063	0.0068602	−0.0076665	0.0022044
COAGE	−0.0046629	−0.0007845	−0.0038783	0.0018156
INNETPRO	0.0393925	0.0269188	0.0124738	0.0040497
lNTOTASS	0.0156407	−0.0184735	0.0341142	0.0091831

Source: Researcher's Computation (2024). b: Consistent under Ho and Ha; obtained from Xtreg

Test: Ho: Difference in coefficients not systematic

Chi-square (4)=(b-B)'[(V_b-V_B)$^{(-1)}$](b-B)

=11.25

Prob>Chi-square=0.0239

(V_b-V_B is not positive definite)

B: Inconsistent under Ha, efficient under Ho; obtained from Xtreg, COAGE: Company age, INNETPRO: Log of net profit, lNTOTASS: Log of total asset, RENG: Renewable energy, fe: Fixed effects, re: Random effects, SE: Standard error

Table 6: Fixed effect regression of renewable energy disclosure on return on equity

ROE	Coefficient	SE	t	P>|t|	95% CI
RENG	−0.19295	0.136486	−1.41	0.16	−0.46361-0.077706
COAGE	0.028546	0.024024	1.19	0.237	−0.0191-0.076186
INNETPRO	0.216147	0.064351	3.36	0.001	0.088537-0.343756
lNTOTASS	0.264755	0.123483	2.14	0.034	0.019885-0.509626
_cons	−10.9917	3.677621	−2.99	0.003	−18.2845-−3.69879
sigma_u	1.636388				
sigma_e	0.457243				
rho	0.927578	(fraction of variance due to u_i)			

Source: Researcher's Computation (2024). COAGE: Company age, INNETPRO: Log of net profit, lNTOTASS: Log of total asset, RENG: Renewable energy, SE: Standard error, CI: Confidence interval, ROE: Return on equity

is calculated as (b - B)'[(V_b-V_B)^(-1)](b-B) and yields a value of 11.25. The associated p-value (Prob>Chi2) is determined as 0.0239. The P = 0.0239 suggests that the differences in coefficients observed between the null and alternative hypotheses are statistically significant at the conventional significance level of 0.05. This indicates that the alternative estimates (B) differ systematically from the null estimates (b). In summary, the coefficient estimates, differences between two sets of estimates, and associated statistics provide insights into the relationships between the variables in the regression model.

4.1.6. Fixed effect regression of renewable energy disclosure on return on equity

From Table 6, the coefficient estimate for RENG is −0.19295, and the t = −1.41. However, it is not statistically significant at the conventional significance level of 0.05 (P = 0.16). This suggests that there is no strong evidence to conclude that the presence of renewable energy disclosure has a significant effect on ROE. The coefficient estimate for COAGE is 0.028546. It is also not statistically significant (P = 0.237), indicating that the age of the company does not have a significant impact on ROE. The coefficient estimate for INNETPRO is 0.216147. It is statistically significant at the 0.05 level (P = 0.001). This suggests that an increase in the natural logarithm of net profit is associated with a positive and significant impact on ROE. Companies with higher net profits tend to have higher ROE. The coefficient estimate for lNTOTASS is 0.264755. It is statistically significant at the 0.05 level (P = 0.034). This indicates that an increase in the natural logarithm of total assets is associated with a positive and significant effect on ROE. Companies with larger total assets tend to have higher ROE. The intercept term is −10.9917. It is statistically significant at the 0.05 level (P = 0.003). The intercept represents the estimated ROE when all independent variables are zero. In this case, it suggests that even in the absence of the independent variables, there is a significant baseline level of ROE. Hence, the hypothesis that returns on equity in Quoted Nigerian Financial Institutions, and disclosures of renewable energy are not related is hereby accepted, and the alternative hypothesis that Returns on equity in Quoted Nigerian Financial Institutions, and disclosures of renewable energy are related is rejected because Renewable Energy Disclosure has a statistically insignificant relationship with the outcome variable (ROE). This is similar to the findings of Islam et al. (2024)

5. CONCLUSION

This study aimed to investigate the relationship between return on equity and variables of environmental sustainability disclosures (i.e. Renewable Energy Disclosure, Greenhouse Gas Emissions Disclosure, and Waste Management Disclosure) in the context of Quoted Nigerian Financial Institutions. The finding shows that returns on equity in Quoted Nigerian Financial Institutions, and disclosures of renewable energy are not related. Also, it was found that returns on equity in Quoted Nigerian Financial Institutions, and disclosure of greenhouse gas emissions are not related. Returns on equity in Quoted Nigerian Financial Institutions and disclosure of waste management are not related.

This study concluded that the relationship between return on equity and environmental sustainability variables disclosures (proxy by Renewable Energy Disclosure and Greenhouse Gas Emissions) are not related. This study used returns on equity as a measure of firm financial performance or profitability. Future studies can make use of other measures of financial performance or profitability such as returns on assets (ROA), and returns on capital employed (ROCE), which cover the interests of larger stakeholders. Since ROE would be more interesting to the shareholder. In a social context, legitimacy theory and stakeholder theory relate not only to shareholders but larger numbers of stakeholders such as equity shareholders, employees, communities, and possibly other stakeholders. More so, organizations need to demonstrate that they are acting according to societal norms and values to gain, legitimacy, support and acceptance from their stakeholders. Hence, environmental sustainability disclosures would still be beneficial to firms.

REFERENCES

Abubakar, I.R., Maniruzzaman, K.M., Dano, U.L., AlShihri, F.S., AlShammari, M.S., Ahmed, S.M.S., Al-Gehlani, W.A.G., Alrawaf, A.I. (2022), Environmental sustainability impacts of solid waste management practices in the global South. International Journal of Environmental Research and Public Health, 19(19), 12717.

Aini, K.N., Murtiningsih, R., Baroroh, N., Jati, K.W. (2022), The Effect of Financial Slack, Institutional Ownership, Media Exposure on Carbon Emission Disclosure with Solvability Ratio as a Moderating Variable. In: Proceedings of the 2nd International Conference of Strategic Issues on Economics, Business and, Education (ICoSIEBE 2021). Vol. 204. p1-6.

Akerlof, G.A. (1970), The market for "lemons": Quality uncertainty and the market mechanism. Quarterly Journal of Economics, 84(3), 488-500.

Azam, A., Rafiq, M., Shafique, M., Yuan, J. (2022), Mitigating carbon emissions in china: The role of clean energy, technological innovation, and political-institutional quality. Frontiers in

Environmental Science, 10, 1-21.
Banos, R., Manzano-Agugliano, F., Montoya, F.G., Gil, C., Alcayde, A., Gomez, J. (2011), Optimization methods applied to renewable and sustainable energy: A review. Renewable and Sustainable Energy Review, 15, 1753-1766.
Berthelot, S., Robert, A.M. (2011), Climate change disclosures: An examination of Canadian oil and gas firms. Issues in Social and Environmental Accounting, 5(1-2), 106-123.
Black, P., Wiliam, D. (2009), Developing the theory of formative assessment. Educational Assessment, Evaluation and Accountability, 21(1), 5-31.
Borgstein, E.H., Lamberts, R. (2014), Developing energy consumption benchmarks for buildings: Bank branches in Brazil. Energy and Buildings, 82, 82-91.
Borgstein, E.H., Lamberts, R., Hensen, J.L.M. (2017), Towards benchmarking of HVAC energy in commercial buildings in warm climates. In: Brotas L, Roaf S, Nicol F, editors. Design to Thrive: Proceedings PLEA 2017 Conference. Vol. 1. p647-654.
Chang, I., Wang, W., Wu, J., Sun, Y., Hu, R. (2018), Environmental impact assessment follow-up for projects in China: Institution and practice. Environmental Impact Assessment Review, 73, 7-19.
Comyns, B. (2016), Determinants of GHG reporting: An Analysis of global oil and gas companies. Journal of Business Ethics, 136(2), 349-369.
Dewayani, N.P.E., Ratnadi, N.M.D. (2021), Pengaruh kinerja lingkungan, ukuran perusahaan, profitabilitas dan pengungkapan emisi karbon. E-Jurnal Akuntansi, 31(4), 836-850.
Dzomonda, O. (2022), Environmental sustainability commitment and access to finance by small and medium enterprises: The role of financial performance and corporate governance. Sustainability, 14, 148863.
Elsayih, J.O., Datt, R., Tang, Q. (2021), Corporate governance and carbon emissions performance: Empirical evidence from Australia. Australasian Journal of Environmental Management, 28(2), 1-27.
Emmanuel, Y.L., Adenikinju, O., Doorasamy, M., Ayoola, T.J., Oladejo, A.O., Kwarbai, J.D., Otekunrin, A.O. (2023), Carbon Emission disclosure and financial performance of quoted Nigerian financial services companies. International Journal of Energy Economics and Policy, 13(6), 628-635.
Emmanuel, Y.L., Doorasamy, M., Kwarbai, J.D., Otekunrin, A.O., Osakede, U.A. (2024), Relationship of environmental disclosure of renewable energy, carbon emissions, waste management, water consumption, and banks' financial performance. International Journal of Energy Economics and Policy, 14(2), 584-593.
Ganda, F., Ngwakwe, C.C. (2014), Problems of sustainable energy in Sub-Saharan Africa and possible solutions. Mediterranean Journal of Social Sciences, 5, 453-463.
Global Reporting Initiatives. (2011). Available from: https:///www.globalreporting.org
Helfaya, A., Whittington, M., Alawattage, C. (2018), Exploring the quality of corporate environmental reporting. Accounting, Auditing and Accountability Journal, 32(1), 163-193.
Hendry, D.F. (2001), Modelling UK Inflation, 1875-1991. Journal of Applied Econometrics, 16, 255-275.
Hidayah, N., Badawi, A., Nugroho, L. (2019), Factors affecting the disclosure of sustainability reporting. International Journal of Commerce and Finance, 5(2), 219-229.
Islam, M., Uddin, M., Hossain, S. (2024) Do environmental reporting practices impact firm performance in Bangladesh? An empirical perspective. Open Journal of Accounting, 13, 15-31.
Li, D., Huang, M., Ren, S., Chen, X., Ning, L. (2018), Environmental legitimacy, green innovation, and corporate carbon disclosure: Evidence from CDP China 100. Journal of Business Ethics, 150(4), 1089-1104.
Luo, L. (2019), The influence of institutional contexts on the relationship between voluntary carbon disclosure and carbon emission performance. Accounting and Finance, 59(2), 1235-1264.
Luo, L., Lan, Y.C., Tang, Q. (2012), Corporate incentives to disclose carbon information: Evidence from the CDP Global 500 report. Journal of International Financial Management and Accounting, 23, 93-120.
Maiyaki, M.A., Marzuki, A., Ahmed, A.A. (2019), Urban solid waste development: A review of Nigeria's waste management policy. International Transaction Journal of Engineering, Management, and Applied Sciences and Technologies, 11(5), 57-70.
Marietza, F., Hatta, M. (2021), The Effects of Carbon Emissions Disclosure on the financial Performance, Unpublished Research Work Online at Research Gate. p1-23. Available from: https://www.researchgate.net/publication/352983405_the_effect_of_carbon_emission_disclosure_on_the_financial_performance
Mubaslat, A. (2021), Introduction to Waste Management. Jordan: International, Youth Ambassadors Foundation.
Nasim, N., Anthony, S., Daurewa, T., Gavidi, S., Horwitz, P., Jenkins, A., & Thomas, J. (2023), Understanding on-site sanitation in rural Fiji: Where definitions of sanitation back-ends differ. Environmental Science: Water Research and Technology, 9(7), 1913-1931.
Nduka, E. (2021), How to get rural households out of energy poverty in Nigeria: A contingent valuation. Energy Policy, 149, 112072.
Ofurum, C.D., Mmadubuobi, L.C. (2023), Effect of carbon emissions and financial performance of Nigerian oil and gas firms. International Journal of Research Publication and Reviews, 4(12), 4777-4786.
Oh, I., Wang, G., Mount, M.K. (2011), Validity of observer ratings of the five-factor model of personality traits: A meta-analysis. Journal of Applied Psychology, 96, 762-773.
Okafor, O.O., Gilbert, O.N., Muojekwu, H.O. (2024), Assessing financial returns through environmental responsibility disclosure among listed oil and gas firms in Nigeria, International Journal of Research Publication and Reviews, 5(4), 545-557.
Okoli, C.N., Egobueze, A., Briggs, D.A. (2020) Waste management policy implementation in Nigeria: A study of rivers state waste management agency. International Journal of Advanced Research, 8, 755-765.
Oyekale, P.J., Olaoye, S.A., Nwaobia, A.N. (2022), Corporate governance and environmental sustainability disclosure in non-financial companies quoted in Nigeria. Journal of Finance and Accounting, 10(2), 121-131.
Perrault, E., Clark, C. (2016), Environmental shareholder activism: Considering status and reputation in firm responsiveness. Organization and Environment, 29(2), 194-211.
Pratiwi, R.D., Rusdi, R., Komala, R. (2019), The Effects of personality and intention to act toward responsible environmental behavior. JPBI Jurnal Pendidikan Biologic Indonesia, 5(1), 169-176.
Rahmawati, R., Setiawan, D., Aryani, Y.A., Kiswanto, K. (2024), Role environmental performance on effect financial performance to carbon emission disclosure. International Journal of Energy Economics and Policy, 14(1), 196-204.
Rohmah, D.F.N., Nazir, N. (2022), Pengaruh kinerja keuangan, kinerja lingkungan, sistem manajemen lingkungan, kepemilikan manajerial dan reputasi kap terhadap carbon emission disclosure. Jurnal Ekonomi Trisakti, 2(2), 749-762.
Rappaport, A. (1986), Creating Shareholder Value: The New Standard for Business Performance. New York: Simer and Schuster Publishing Group.
RBS. (2015), RBS Environmental Statement: Setting out Our Approach to Ensure that RBS Considers Environmental Issues in All Parts of its Operations and Business Activities. Document Classification Public. United Kingdom: RBS.

Saptiwi, N.W.T. (2019), Disclosure of carbon emissions: Examining the role of industry type, environmental performance, company characteristics and audit committee. Jurnal Akuntansi Bisnis, 17(2), 227- 240.

Septriyawati, S., Anisah, N. (2019), Pengaruh media exposure, ukuran perusahaan, profitabilitas dan leverage terhadap pengungkapan emisi karbon pada perusahaan manufaktur yang terdaftar di bursa efek Indonesia periode 2014-2018. SNEB: Seminar Nasional Ekonomi dan Bisnis Dewantara, 1(1), 103-114.

Shahbaz, M., Raghutla, C., Chittedi, K.R., Jiao, Z., Vo, X.V. (2020), The effect of renewable energy consumption on economic growth: Evidence from the renewable energy country attractive index. Energy, 207(C), 118162.

Spence, M. (1973), Job market signaling. Quarterly Journal of Economics, 87, 355-374.

Spence, M. (2002), Signaling in retrospect and the informational structure of markets. American Economic Review, 92, 434-459.

Uyar, A., Karaman, A.S., Kilic, M. (2020), Is corporate social responsibility reporting a tool of signaling or greenwashing? Evidence from the worldwide logistics sector. Journal of Cleaner Production, 253. 119997.

Zhou, W., Lou, C., Li, Z., Lu, L., Yang, H. (2010), Current status of research on optimum sizing of stand-alone hybrid solar-wind power generation systems. Applied Energy, 87, 380-389.