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Natural and Manufactured Capital Disclosures on Financial Performance: Empirical Evidence From Listed Downstream Oil and Gas Companies in Nigeria

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ABSTRACT:- *The financial performance of listed downstream oil and gas companies has increasingly come under the academic searchlight due to a lack of consensus regarding the impact of non-financial capital reporting. Consequently, this study examined the effect of natural and manufactured capital disclosures on the financial performance of listed downstream oil and gas companies in Nigeria. To achieve this objective, an ex post facto research design was employed, utilising a census of ten downstream oil and gas companies listed on the Nigerian Exchange Group as at 31st December 2024. The study utilised panel data spanning a ten year period and employed panel regression analysis via E-Views 12 statistical software to ensure analytical rigour. The empirical results revealed that Natural Capital Disclosure does not significantly influence the Return on Assets (ROA) of the sampled firms. Conversely, Manufactured Capital Disclosure was found to have a statistically significant but negative effect on financial performance, suggesting that intensive infrastructure and technological reporting may coincide with reduced short term asset efficiency. Based on these findings, the study concludes that while integrated reporting is essential for transparency, its immediate financial benefits remain elusive in the Nigerian downstream sector. The study recommends that the Financial Reporting Council of Nigeria should strengthen regulatory oversight to enforce mandatory environmental disclosure standards. Furthermore, industry associations should standardise reporting practices to align with international best practices, ensuring that capital disclosures provide more value relevant information to investors..*

KEYWORDS: Natural capital disclosure, manufactured capital disclosure, Return on Assets, firm Size and Corporate Financial Performance.

I. INTRODUCTION

Financial performance is a major key in all economic decision making relating to public and private companies to identify the natural and manufactured cost (Chakroun & Matoussi, 2022), Financial performance is a quantitative ration of how well a firm uses asset from its business operations to generates revenue. Financial performance is also seen as a measure of a firm's overall financial health over a given period. According to Grant (2017), financial performance is a fundamental indicator of a company success, reflecting its ability to generate profit and create value shareholders. Key metrics such as return on equity, profit margins, and earning per share are commonly used to assess financial health. Assessing the financial performance of the firm at a given time can be measured by value-based measure (Grant 2017), The financial position of firm is now necessary for investors to take decisions on activities of the organization. Abeysekera (2024), stated that detailed accounting information are needed to know if a company is making profit or not.

According to Akpan and Simeon (2021), before the late 90s, organizations adopted the traditional reporting system for communicating to their stakeholders regarding their performances because most businesses as at that time offer a narrow range of products or services and do not require custom designs. The system focused mainly on cost reporting and fixed-asset utilization to reflect the essential traits of conventional businesses, such as incremental labour and machine (Onyali, et al. 2017). The reports (traditional reports) are usually publicized only for shareholders and fund providers and have different intended purposes (Simnett & Huggins, 2019).

Given the present level of globalization, it may no longer be appropriate to view organizations as instruments of shareholders alone, but rather organizations now exist and have responsibilities to the larger society. Thus, in the views of Eccles and Krzus (2021), which is also shared by Drevensek (2020), it has become clear that in the long run, corporations cannot succeed in a world that lack information, collapsing and where trust in organizations is seriously in doubt. Therefore, a shift towards greater accountability to all interests group is imperative. Simnet, et al. (2019), noted the consistent concern that traditional annual accounts and reports do

not adequately represent the multiple dimensions of corporate value today. Iyoha, et al. (2017), observed that traditional annual financial reporting in most cases are insufficient to meet the information needs of variety of stakeholders like customers, employees, suppliers, government, and local community who would like to have a holistic view of the performance of the companies. Blowfield and Murray (2018) further stated that, the traditional financial reporting measures performance that focused solely on financial issues and overlooked by-products of commercial activity for which others have to pay, such as pollution and emissions of gas substances thereby causing environmental degradation.

The need for more reporting of non-financial information in the annual report by corporate entities is so important especially after the global financial crisis of 2008 when the world experienced the sudden collapse of giant corporate entities namely Xero; Global Crossing; Tyco (USA); Parmalt (ltaly); Enron (USA); Worldcom MCL (USA); Satyan (India); Kmart (USA); One.tel (Australia, 2017); Royal Ahold (Netherland); System Computer Service (India); (Abeysekera, 2018). Nigeria has its fair share of corporate collapse especially in the banking sector where banks like Savannah Bank Plc., Intercontinental Bank Plc., Oceanic Bank Plc. and Afrik Bank Plc collapsed (Okunbor & Arowoshegbe, 2019).

There was an increasing number of investors who have been showing great interest in sustainable information in the form of natural, manufactured, social and governance information (Ferdy, et al 2009). Some are driven by moral or ethical reasons whereas some are driven by economic reasons since these types of information could improve the performance of the company and improve the risk-return profile of their portfolio. The current thinking is that organizations are obliged morally to enhance a positive contribution to society (Habidin, et al. 2022). This is based on the understanding that organizations exist because society has supported them to operate, to use resources and to affect the quality of citizens' lives (Ávila, et al 2023). Thus, it is expected that corporate reporting should provide insights into how a company views itself and its role in society, communicating company's performance and indicating commitments to improve future performance and establish accountability for meeting organizational objectives (Krzus, 2011). This has compelled companies to look beyond financial performance. As a result, companies started exhibiting sustainability reports which include sustainability information in the form of environmental, social and governance data.

It is in the light of the deficiency in the traditional annual report, financial and economic crisis of 2008 those various initiatives to enhance the quality of corporate information reporting emerged. Such initiatives emerged from the following reports; triple bottom line (TBL), social and natural accounting (SNA), corporate social responsibility (CSR) and sustainability reports (Eccles & Krzus, 2011). Thus, the current corporate reporting model consists of the production of financial report (annual report), corporate social responsibility report and sustainability report. However, most orgainsations' corporate reports focus mainly on the financial reporting which they present as annual reports with a bit of social, environmental and sustainability issues addressed in the Chairman/Chief Executive Officer report. Where natural responsibility and sustainability reports are produced, they are often time released independently of the financial reports.

Businesses all over the world, especially oil and gas firms for many decades have ignored the impact of their activities on the natural and manufactured in which they operated, unless it had direct repercussions on the statement of profit or loss account. Friedman (1970) famously supported this classical view of business objectives by stating that the sole reason for a firm's existence is to maximize the wealth of the shareholders, and that any act of philanthropy equates to stealing from the shareholders' wealth. However, the neglect by oil and gas companies in Nigeria of the negative externalities arising from the pursuit of economic objectives along with various natural abuses by companies have created negative attitudes among stakeholders towards business.

There has been a continued and widespread financial performance reporting problem (absence of transparency reporting) in recent years among the financial entities globally, which threatened the continued survival and performance of these companies. These had been linked to lots of factors negatively affecting the financial performance of the companies, which allowed the companies to takes excessive risks. The decision-making process of every system thrives on financial performance information, and the business environment is not an exception. Oprisor (2022), averred that financial performance information plays a vital role in the decision-making process of the business community coupled with the fact that investment decisions rely heavily on financial performance information at the disposal of investors (Mirza et al, 2019). Hence, reporting which is the communication of financial performance information is essential to the continued survival of any business. Meanwhile, every stakeholder relating with an organization is concerned mostly about the corporate financial performance and the long-term survival tendencies of such firm, hence, the need for corporate reporting. However, the orientation that stake-holders are only concerned about the financial performance of firms has led

to the traditional mode of reporting whereby reports are separated into categories such as annual report, environmental report and social report which are then published separately for the exclusive access of few people (Jensen & Berg 2023). Moreover, this traditional mode of reporting has been plagued with absence of transparency (Weybrecht 2021), which then necessitates the need for the convergence of both financial and non-financial information in a single report now referred to as integrated reporting (IR) (Serafeim, 2023).

In Nigeria, several researches have been done on the natural and manufactured accounting on financial performance of listed firms. For instance, most of the earlier research that focused on the subject are Iyoha et al. (2017), Lipunga (2016), have best used durations that are time restricted. This is because their analysis typical time range has been between 5 and 6 years. To guarantee a thorough research exercise, the study period was extended to 10 years from 2015 – 2024, to acquire a deeper understand of the problems. There is also methodology gap. In most of the studies conducted in the field of study Cosma et al., (2018), Suttipun, (2019). Primary data were used. Due to its difficulties and the commitment in the sample firms, and method analyzing information is subject to bias. Pannel regression analysis on secondary data will be use in this study to advance empirical research on topic to conduct a more in-dept investigation the gap in literature and looking using Pannel regression analysis to examine effect of natural and manufacture capital on financial performance on listed downstream oil and gas company in Nigeria. this helped the research to expand advertently, because of the benefits of the IR, the framework is becoming generally acceptable and has evolved to be an area of interest to researchers and professionals alike. However, there still exists paucity of empirical studies on the subject matter especially in Nigeria (Iyoha et al., 2017; Lipunga, 2015; Umoren et al., 2015). Ordinarily, firms may not necessarily consider natural and manufactured report as important if there exists no evidence of a positive contribution to performance, hence, it becomes pertinent to ask; will natural accounting improve firm performance better than the traditional reporting style? Meanwhile, the existing studies in literature has generated mixed discoveries as regards the effect of natural and manufactured capital on financial performance as there are evidences of mixed, positive and negative effects while some even discovered insignificant effects (Albetairi et al., 2022; Bijlmakers, 2022; Cosma et al., 2023; Suttipun, 2023). In addition, studies have failed to establish the existence of a long run relationship between natural and manufactured capital on firm performance (Jeroe, 2023; Nurkumalasari et al., 2021; Soumillion, 2023), that is, the question as to if a natural and manufactured capital disclosure on financial performance has a long run relationship with corporate performance. Therefore, premised on these reasons, it becomes imperative to empirically investigate the effect of natural and manufactured capital disclosure on financial performance of 10 listed downstream Oil and Gas company in Nigeria. This will help research to expand the scope of knowledge. To achieve the above objective, the following hypotheses were formulated for the study;

$H0_1$: Natural capital disclosure index has no significant effect on return on assets of listed downstream oil and gas companies in Nigeria.

$H0_2$: Manufactured capital disclosure index has no significant effect on return on assets of listed downstream oil and gas companies in Nigeria.

II. LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Natural Capital Disclosures Index

Natural capital accounting serves as a comprehensive framework for valuing ecosystem benefits and integrating environmental impacts into economic decision making to address the consequences of environmental abuse. According to Udo (2016), this reporting structure enables organisations to identify and account for environmental assets, costs, and contingent liabilities to support managerial control and public disclosure. This study adopts the International Integrated Reporting Council (IIRC, 2013) index to measure natural capital by evaluating disclosures related to carbon emissions, energy consumption, waste management, and compliance with environmental laws. The unweighted sustainable disclosure index facilitates a systematic assessment of how firms manage renewable and non-renewable resources, such as water, timber, and fossil fuels, while striving for efficiency through recycling and reduced material extraction. Implementation of these accounting practices allows companies to mitigate land degradation and optimise resource application, ensuring that corporate activities remain aligned with the preservation of properly managed ecosystems.

2.1.2 Manufactured Capital Disclosures Index

Manufactured capital encompasses the human created material goods and infrastructure, such as buildings, machinery, and technology, that an organisation utilises to facilitate production without becoming embodied in the final output. According to Black Sun (2017), the proper management of these assets allows a firm to remain flexible and responsive to shifting market demands while fostering the adoption of creative

opportunities for sustainable development. Buhr (2017) argues that the acquisition of efficient equipment and the use of eco efficient materials result in an improved production system that reduces resource consumption. By establishing partnerships with suppliers and focusing on technological impacts, companies can improve the efficiency of their production processes and enhance value creation. Consequently, the disclosure of manufactured capital components as prescribed by the integrated reporting framework is expected to improve the financial performance of reporting firms by demonstrating operational resilience and resource optimisation.

2.1.3 Financial Performance

Financial performance is a composite of an organization's financial health, its ability and willingness to meet its long-term financial obligations and its commitment to provide services in a foreseeable future. Financial performance refers to the act of performing financial activity. In broader sense, financial performance refers to the degree to which financial objectives being or has been accomplished. It is the process of measuring the results of a firm's policies and operations in monetary terms. Financial performance is broadly viewed as the firm to meet its financial objectives. Two prominent indicators of financial performance are investor's return and accounting returns.

Financial performance is a key financial metric that refers to a company's ability to generate profit which is mostly measures the efficiency of the managers and the firms' returns/profit for their investors (Etim et al., 2022). Financial performance measures provide an insight to the degree of success or otherwise in achieving its primary objective. It is an important concept in business and finance, and has been widely defined. Financial performance measures the extent to which a business generates profit from the factors of production namely capital, entrepreneur, labour and land. It is considered an indicator of growth, success and control. Shareholders also are interested in profitability since it indicates progress and the rate of return on their investments. In the accounting literature, corporate performance can be measured by means of profitability indicators such as earnings per share (EPS), dividend per share (DPS), return on asset (ROA), return on equity (ROE), operating profit (OP), return on capital employed (ROCE), profit margin (PM), return on investment (ROI) or market-based measurement ratios like Tobin's Q, market value added (MVA), market-to-book value (MTBV), annual stock return (RET) among others. In view of the aforementioned, this study shall focus on profitability measure of performance such as the return on assets (ROA).

2.1.4 Return on Asset

This is a measure of performance and it is an important ratio for investment decisions by shareholders. On a general basis, if return on assets is more than the firm borrows for investments in new projects then they could be embarked upon otherwise it is not embarked upon. In addition, ROA provides a standard for assessing how efficiently management employs the average amount which is invested in the firm‟s assets, whether the amount come from investor or creditors (Al Hassan, 2020). A low level of return on assets shows that the profits are low for the amount of assets. The return on asset ratio calculates how efficiently profits are being collected from the assets employed. A low return on assets ratio when compared with industry average indicates that there is inefficient utilization of business assets.

According to Ordu & Amah (2019**)** return on assets (ROA) refers to a financial ratio that indicates how profitable a company is in relation to its total assets. Corporate management, analysts, and investors can use ROA to determine how efficiently a company uses its assets to generate a profit. The metric is commonly expressed as a percentage by using a company's net income and its average assets. A higher ROA means a company is more efficient and productive at managing its balance sheet to generate profits while a lower ROA indicates there is room for improvement. Businesses are about efficiency. Comparing profits to revenue is a useful operational metric, but comparing them to the resources a company used to earn those displays the feasibility of that company's existence. Return on assets is the simplest of such corporate bang-for-the-buck measures. It tells you what earnings are generated from invested capital or assets. Put simply, a higher ROA means more asset efficiency.

ROA explains how efficient a company is in utilizing its available assets to generate profit. It calculates the percentage of profit a company earns against per naira of assets, the higher the value of ROA the better the performance (Weston & Brigham, 1977). This has been used by previous studies such as Korolo and Korolo (2023), Olanisebe et al. (2023) and Razaq et al. (2023) that individually used ROA as a proxy for performance.

2.1.5 Firm Size

Performance in any business has been significantly influenced by the size of the firm. Businesses have always sought to become larger to gain a competitive advantage. Economics of scale explain the positive correlation between performance and size. But even as they growth in size, a lot of businesses are still

performing poorly on a yearly basis. Large companies generally draw economies of scale and large number of investors because they affect their profitability, which is crucial for competing with rivals in areas where a company reduces costs. The entirety of company assets determines it size, larger corporations are thought to have a better prospect during a period of relative stability and could generate profit compared to companies that have small total assets companies. Since large scale firms are more competitive than small businesses because they have a broader market and more potential to achieve a sizeable profit. Large corporations can also finance their investments due to easy access to capital and low incidence of asymmetric knowledge. It is supported by research to say that the size of the company affects the capital structure (Marfuah &Nurlela, 2019).

2.2 Empirical Review

Numerous researchers have been conducted on integrated reporting in both within and outside of Nigeria. Below is the details analysis of some of the relevant empirical literature that is believed to be relevant to these studies.

Onyekachi (2024), assessed the effect of environmental costs on the earnings of listed oil and gas firms within the Nigerian economy over a ten-year period (2008-2017). *Ex-post facto* research design was adopted, and secondary data were sourced from the financial reports of the five selected firms. The study examines the impact of environmental cost on earning per share of the selected firms. Data analysis was conducted using the ordinary least square regression method and findings indicate that firm's costs on the environment associates significantly with their earnings. Hence the study recommended for all business units in Nigeria to keep pace with contemporary financial reporting issues by engaging in an adequately reporting their investments in the replenishment of the planet as that will promote their organizational image and business. The study only focused on environmental investment activities of firms largely drawn from unavailability of the global accounting standard to ensure accountability and harmonization of environmental reports; and so, the report failed to comply with Integrated reporting (IR) framework.

Adegbei & Nwobodo (2024), examined Environmental Accounting & Reporting Practices: Significance and Issues: A Case listed Deposit Money Banks (DMBs) in Nigeria. The primary data were collected from the total number of 34 Accountants, using random sample technique, taking two from each company. The findings show that EAR practices in DMBs is highly significant but not too satisfactory as there are many issues hindering them from carrying out best practices in EA and ER and hence poor in real sense of the term. Therefore, in order to improve the EAR practices in the DMBs, the proper authority need to implement the suggestions put forward by the respondents without any further delay. The study only centered on quoted DMBs and recommendations and conclusions could not be generalized as it is only focused on a sector of the economy in Nigeria.

Ismail et al. (2021), examined the liquidity management and financial performance of quoted Nigeria oil and gas companies. Ten publicly traded oil and gas businesses served as both the study's sample and its population. An analysis of fixed-panel regression was performed on the data. From 2011 to 2020, ten years of secondary asset data were collected from their annual reports that were published. Profitability (ROE) was calculated using (PAT) profit after tax, (ROE) return on equity, and (ROA) return on asset. The behavior of the dependent variable was found using. However, external variables such as the exchange rate and loan interest rate were utilized to provide further context for the profitability pattern. Sales, debt, and equity are examples of internal liquidity factors. A multiple regression analysis was performed to examine the data. Findings revealed that debt significantly reduces company's profitability and concluded that liquidity management significantly and negatively affects financial performance. It recommended that to enable oil and gas companies to create greater wealth for their shareholders, the study advised them to grow their debt financing, increase their equity capital, improve their revenues, and boost their retained earnings. Thus, the study only looked at one area of Nigeria's economy-the oil and gas industry-it has an institutional gap. Comprehensive coverage would have produced insightful recommendations and findings.

Chiamogu & Okoye (2020), examined the extent environmental cost affects financial performance of oil and gas companies in Nigeria. Ex post facto research design was employed and data was obtained from annual reports and accounts for the periods 2011 to 2018. The hypotheses were tested using regression analysis with aid of e-view 9.0. The results of the empirical data analysis revealed that community development cost and environmental remediation cost has insignificant relation with EPS. The study recommends that oil firms should provide comprehensive reports of their environmental involvement and also government and stakeholders should be concern and mandate compliance to standards regulating and mandating firms to report environmental accounting satisfactorily. The study was conducted five years ago, the result and suggestions might not be relevant to economic activities of nowadays.

Burhan and Rahmanti (2020), ascertained the relationship between sustainability reporting and company performance of 32 companies listed on the Indonesian stock exchange during the period 2006 – 2009, from which 20 companies were chosen as sample size. The study used multiple regression analysis and the result showed that sustainability reports does have an association with company performance, however, partially as only social performance disclosure influences the company performance. The study employed an explanatory and descriptive research design. It was recommended that the firms should improve in the quality of integrated reporting. The study was completed 16 years ago, therefore its applicability to the current economic situation in Nigeria.

Onuora and Chiedu (2019), investigated the effect of environmental cost on financial performance of oil and gas companies in Nigeria. In the study, they selected the sample of seven (7) listed oil and gas companies at Nigeria stock exchange group. The data was collected for two years each financial statement for the seven listed oil and gas companies 2017 and 2018. The study applied ordinary least square and regression analysis in testing the formulated hypothesis. The study revealed that environmental costs have no significant effect on gross profit margin (GM) and environmental cost has significant effect on returned on capital employed. Based on the findings, the study recommends that management of oil and gas companies should continue to engage in incurring environmental costs accordingly. The time frame for the study was too short and it is not possible to generalize the result and suggestions due to limited sample size.

Okoye and Adeniyi (2019), examined the effect of environmental protection costs on product price in Nigeria. A survey design was used for the study. Questionnaire was administered to generate data. Researcher employed purposive sampling technique in selecting the sample frame. The study focuses on Brewing Industry located in Lagos State. The population of the study consists of Management Accountants in Nigeria Brewing Plc, Guiness Plc, Coca – Cola Plc and Seven - Up Plc. The study discovered that there was negative relationship between environmental regulatory cost and product pricing decision. The study therefore recommend that company should design accounting system that will capture expenses incur on environmental matters. This will enable the firm to appreciate the amount they have invested in managing firm's waste and the cost incur to comply with environmental protection rules and regulations. A census method was employed in the study. However, another sampling technique might be explored

Agboola and Ayodeji (2019), examined Environmental Cost and Financial Performance: Analysis of Cement Companies in Nigeria. Regression analysis was adopted with the aid of Statistical Package for Social Sciences (SPSS) to determine the correlation between the two variables. The study found that Environmental Cost Savings was significantly related to Financial Performance of the quoted cement companies. The study concluded that Environmental cost Savings positively impacted on the business value of the companies and therefore recommends that continues investment in Environmental Cost Savings will yield a strong relationship to financial performance of the companies and should be considered as significant stimulant of financial performance. Its conclusion and suggestion might not apply to other Nigeria industries because it concentrated on specified company.

Nyirenda et al., (2018) examined the impact of environmental management practices on the financial performance of a South African mining firm. Using multiple regression statistics, the return on equity of Green-Steel is regressed on three environmental management practices of Green-Steel (carbon reduction, energy efficiency, and water usage). The result showed there is no significant relationship between the variables and this lends credence to information gathered from Green-Steel environmental reports that Green-Steel's environmental management practices are driven mostly by a desire to abide by regulations and also by a moral obligation to use environmental management practices to mitigate climate change impact. The study conclusions and suggestions could not be applied due to poor recommendation.

Nwaiwu and Oluka (2018) examined the effect of environmental cost disclosure and financial performance measures of quoted oil and gas companies in Nigeria. The study adopted secondary data. Pearson product moment coefficient of correlation and multiple linear regression analysis with the aid of special package for social sciences (SPSS) version 22. The econometric results reviewed adequate disclosure on environmental cost, compliance to corporate environmental regulations have positive significant effect on financial performance measures. The study concluded and suggested that companies should compliance with the modern standard of reporting. The conclusion of the study could not be generalized to other sectors of the economy.

Hai et al (2018), examined the relationship between environmental disclosures and financial performance using a random sample of potentially polluting publicly listed companies in Singapore from 2012-

2015. The issue was examined from several perspectives: (a) if there is any difference in financial performance between disclosing and non-disclosing companies of environmental information, (b) whether extent of environmental disclosure can be linked to financial performance, and (c) if there is any impact of prior financial performance on subsequent environmental disclosures, and vice-versa. Results showed that a positive link existed although the evidence was less strong for the impact of environmental disclosures on subsequent financial performance. All null hypotheses were rejected. This finding should encourage Singapore companies to increase the content of their environmental reporting in annual reports. This is important in order to expose pollution-prone companies to a wider spectrum of stakeholders on their role to achieve a cleaner and greener environment. The time frame of the study 2012-2023 was too short and it is not possible to generalize the result.

2.3 Theoretical Framework

2.3.1 Resource Dependency Theory

Resource dependence theory (RDT) proposes that an organization's survival and success depend on its ability to manage its reliance on external resources, such as raw materials, employees, and funding, from other organizations and its environment. Organizations must strategically acquire and control these critical resources, but doing so also creates power dynamics and potential risks of external control, influencing organizational behavior and strategy. Key to RDT is the understanding that firms cannot be entirely self-sufficient and must engage in collaborations, strategic alliances, and other relationships to access necessary resources and reduce environmental uncertainty.

Resource Dependence Theory, primarily developed in the 1970s by Jeffrey Pfeffer and Gerald Salancik, is a cornerstone of organizational theory. It focuses on how external resources affect the behavior and strategies of organizations. Central to this theory is the notion that no organization is entirely self-sufficient; all organizations require resources from the environment, and this dependency influences their behavior and decision-making processes.

Key aspects of Resource Dependence Theory include:

Resource Dependence: The central premise is that organizations depend on resources that are often outside their control. These resources can include funding, information, materials, and legitimacy. The need to secure these resources drives many organizational actions and strategic decisions.

Power and Influence: The theory posits that power in relationships between organizations is determined by the relative dependencies on resources. An organization that controls a resource which another organization needs can wield significant power over that organization.

Strategies for Managing Dependencies: Organizations adopt various strategies to manage resource dependencies and mitigate risks. These strategies can include vertical integration, forming alliances and joint ventures, diversifying resource base, and influencing the environment through lobbying or other means.

Environmental Uncertainty and Constraints: Resource Dependence Theory emphasizes the role of environmental uncertainty and constraints in shaping organizational behavior. Organizations constantly adapt to changes in the availability and control of critical resources.

Inter-organizational Relationships: The theory highlights the importance of inter-organizational relationships and networks. Through collaborations, alliances, and joint ventures, organizations can reduce uncertainty and secure essential resources.

Organizational Autonomy and Survival: The ultimate goal for organizations, from the perspective of Resource Dependence Theory, is to maintain autonomy and ensure survival. This goal drives organizations to actively manage their resource dependencies and power dynamics.

Influence on Strategic Decision-Making: This theory has had a profound influence on the field of strategic management, highlighting how external resource dependencies can shape strategic choices and organizational structures.

Criticism and Limitations: Some criticisms of the theory include its sometimes overemphasis on external constraints over internal dynamics, and its lessened applicability in highly dynamic or digital markets where resource flows are more complex and less predictable.

2.3.2 Stakeholders Theory

Freeman (1984) developed this theory and argues that although it is widely believed that shareholders are the only stakeholders in an organization, organizations are accountable to all of the company's stakeholders. It also describes the three parties that make up an organization: stakeholders, agents (managers), and principals (shareholders). Also, it promotes a moral, practical, effective, and profitable method of running enterprises in a highly unstable and complex world. Freeman (1984), defined Stakeholders are people, groups, and organizations that are dependent on the company to accomplish its objectives and who have an interest in the processes and products of the business. These stakeholders include workers and supervisors, investors, lenders, clients, and vendors who contribute to the company's value-creation activities. According to Harrison et al, (2010), the

parties concerned could be referred to as legitimate or principal stakeholders. According to stakeholder theory, "managing for stakeholders" involves, at the very least, taking these stakeholders' interests and well-being into account (Harrison et al, 2010). Thus, there are other stakeholder groups included, including but not limited to communities, media, environmental or special interest groups, and society at large. Given that determining what is desirable for a group as broad and diverse as society is nearly impossible, it is a little more challenging to understand in terms of the fundamental concepts of stakeholder theory. The fact that stakeholder theory takes a complete approach and promotes treating all stakeholders fairly, honestly, and even freely is an interesting and significant feature of the theory. The stakeholder theory maintains that businesses with high firm value draw interest from investors and develop the confidence of investors and other relevant stakeholders. It also shows that these businesses would always have high levels of dividend policy, liquidity, and profitability. Higher profitability, liquidity, and dividend policy of a company is believed to be able to give investors a good reason to become more interested in the business.

In the second model, the corporate planning and analysis extends to include external influences which may be adversarial to the firm. These adversarial groups may include the regulatory environmentalist and/or special interest groups concerned with social issues (Guthrie and parker, 1990). The second, model enable managers and accountants to consider a strategic plan that is adaptable to change in the social demands of non-traditional stakeholders' groups. The stakeholder's theory proposed an increased level of environmental awareness which creates the need for companies to extend their corporate planning to include the nontraditional stakeholders like the regulatory adversarial groups in order to adapt to changing social demands (Trotman, 1999). The main concern of the stakeholder's theory in environmental accounting is to address the environment cost elements and valuation and its inclusion in the financial statements.

The theory is connected to this study as it relates to the debate, and it best explains the nature of relationship expected from the interaction between the three parties that make up an organization: stakeholders, agents (manager), and principals (shareholders) as regards financial performance and integrated reporting of listed oil and gas companies in the Nigerian Exchange Group (NGX), because, there is division of the three parties' ownership, control and interest group (Agents, Principals and stakeholders). It emphasizes the conflict between goals that is brought about by different people participating in the organization's activities and trying to get what's best for them. integrated reporting, however, might reduce agency conflict and increase an organization's financial performance This theory states that every facet of financial performance, including financial capital, Manufacturing capital, intellectual capital, human capital, natural capital and social capital should complement one another to foster financial security and stability in listed oil and gas companies which would translate to an increase in financial performance. Hence, the organizational clichés become more complex because of this approach.

III. METHODOLOGY

This study employed an ex-post facto research design because the data used was historical. The population and sample size of this study comprise of 10 downstream oil and gas companies that are listed on the Nigeria Exchange Group (NGX) limited as at 31st December 2024, from 2015 to 2024. The data were collected from secondary source only, which are available on Annual Financial Reports of the companies. To obtain data for the natural and manufactured capital metrics, a disclosure checklist developed in accordance with IIRC (2013) Framework checklist was developed, and dummy of '1' was assigned to integrated reporting items disclosed and '0'for otherwise. A multiple regression models were used to determine effect of natural and manufactured capital disclosure on financial performance. The ordinary least square regression technique was used in the data analysis.

Model Specification used for this study

The study adapted the model used by Ordu and Amah (2021) which examined sustainability accounting and financial performance of oil and gas companies in Nigeria. The model was given thus:

$ROA = f(ESPit)$ (i)

Where:

ROA is Return on Assets, ESP is Environmental Spending.

However, the model was modify in order to determine the effect of natural and manufacture capital on financial performance of listed downstream oil and gas companies in Nigeria, the model captures contribution of explanatory variables on performance. The functional and E-view model are stated as:

ROA = FP (NC, MC and FS) ……. (ii)

The following regression model that was used in this study:

$ROA = \beta_0 + \beta_1 + NC + \beta_2 + MC + \beta_3 + FS + €it$ ……. ….....(iii)

Where:

FP = Financial Performance (measured by Return on Assets)
NC = Natural Capital disclosure
MC = Manufactured Capital disclosure
FS = Firm size (control variable)
μ = Error term
€i = Stochastic Error term
β_0 = the autonomous parameter estimates (intercept or constant term)
i = refer to the firm and;

Table 1: A priori Expectation

Variable	Variable acronym	Expected sign	Rationale
Natural Capital disclosure	NC	Positive (+)	Natural Capital disclosure would positively boost the ROA
Manufactured Capital disclosure	MC	Positive (+)	Manufactured Capital disclosure would significantly boost the ROA
Firm Size	FS	Negative (-)	Larger Firm benefit from economic scale Would boost the ROA and stronger market positioning.

Source: Researcher's Compilation (2026)

Table 2. Study Variable and their Measurement

Variable acronym	Variable Name	Variable Type	Measurement	Source
FP	Financial Performance	Dependent	Return on Assets (ROA) = Profit before tax divided by total assets	Chiamogu & Okoye (2020
NC	Natural Capital	Independent	Measure as an index that indicates the level of company voluntary Natural capital reporting. One will be assigned when an item on the disclosure framework is disclosed and zero if not disclosed	Setia *et al.* (2015)
MC	Manufactured Capital	Independent	Measure as an index that indicates the level of company voluntary Manufactured capital reporting. One will be assigned when an item on the disclosure framework is disclosed and zero if not disclosed	Setia *et al.* (2015)
FS	Firm Size	Control variable	Natural logarithm of total assets	Etim et al. (2022)

Source: Researcher's Compilation (2026)

IV. RESULT AND DISCUSSION

4.1 Descriptive Statistics

The statistical test presented in the image offers a comprehensive descriptive analysis of four key financial and disclosure-related variables: Return on Assets (ROA), Natural Capital Disclosure (NC), Manufacturing Capital Disclosure (MC), and Firm Size (FS). The primary objective of this test is to evaluate the central tendency, dispersion, and distribution characteristics of these variables across a sample of 100 firms, thereby shedding light on their behavior and underlying data properties.

Table 3: Descriptive Analysis Result

	ROA	NC	MC	FS
Mean	0.225772	0.930000	0.840000	6.678468
Median	0.196567	1.000000	1.000000	6.371857
Maximum	0.674841	1.000000	1.000000	8.914067
Minimum	0.058670	0.000000	0.000000	5.239405
Std. Dev.	0.118334	0.256432	0.368453	0.973907
Skewness	1.167094	-3.370606	-1.854852	1.020810
Kurtosis	4.468124	12.36098	4.440476	2.940468
Jarque-Bera	31.68257	554.4664	65.98699	17.38233
Probability	0.000000	0.000000	0.000000	0.000168
Sum	22.57723	93.00000	84.00000	667.8468
Sum Sq. Dev.	1.386279	6.510000	13.44000	93.90100
Observations	100	100	100	100

Source: E-views 12 Output (2026)

Return on Assets (ROA) maintains a mean value of 0.2257 with a standard deviation of 0.1183, suggesting a relatively stable level of profitability among the sampled downstream oil and gas companies. The maximum ROA of 0.6748 compared to a minimum of 0.0586 indicates a moderate range of financial performance within the industry. Natural Capital Disclosure (NC) and Manufactured Capital Disclosure (MC) exhibit high mean values of 0.9300 and 0.8400 respectively, with the median for both variables resting at 1.0000. These statistics suggest that a significant majority of the listed firms in the downstream sector comply with the disclosure requirements for both natural and manufactured capitals. Low standard deviations for NC (0.2564) and MC (0.3684) confirm that there is limited variation in the reporting patterns of these firms, as most companies tend to disclose these items in their annual reports consistently.

Firm Size (FS), measured as the natural logarithm of total assets, shows a mean of 6.6784 and a median of 6.3718, indicating a fairly consistent size distribution across the sampled firms. Statistical normality was assessed using the Jarque Bera test, which considers both the skewness and kurtosis of the data distributions. The probability values for the Jarque Bera test across all variables are significant at the 1% level, as indicated by p-values of 0.0000, signifying that the data for ROA, NC, MC, and FS deviate from a perfectly normal distribution. Negative skewness observed for Natural Capital Disclosure (-3.3706) and Manufactured Capital Disclosure (-1.8548) indicates that the distribution is skewed toward the left, confirming that most observations are clustered at the higher end of the disclosure index. Excessive kurtosis is particularly evident in the Natural Capital Disclosure variable (12.3609), suggesting a leptokurtic distribution with a sharp peak that reflects the concentration of firms around the full disclosure mark.

4.1.2 Correlation Analysis

The test under consideration is a correlation analysis aimed at examining the association between Return on Assets (ROA) and three key independent variables: Natural Capital Disclosure (NC), Manufacturing Capital Disclosure (MC), and Firm Size (FS), using data from 10 firms spanning the years 2015 to 2024. The objective of this test is to determine whether variations in ROA are meaningfully connected to changes in these disclosure and organizational metrics. The null hypothesis for each variable states that there is no significant correlation between ROA and that variable. The decision rule applied is straightforward: if the p-value associated with the correlation coefficient is less than the conventional significance level of 0.05, the null hypothesis is rejected, indicating a statistically significant relationship.

Table 4: Correlation Analysis

Covariance Analysis: Ordinary
Date: 01/23/26 Time: 11:09
Sample: 2015 2024
Included observations: 10

Correlation Probability	ROA	MC	NC	FS
ROA	1.000000 -----			
MC	0.037210 0.7132	1.000000 -----		
NC	-0.085761 0.3962	0.094079 0.3518	1.000000 -----	
FS	0.026573 0.7930	0.118433 0.2406	-0.139148 0.1674	1.000000 -----

Source: E-views 12 Output (2026)

The correlation matrix provides an assessment of the linear relationships between the variables and serves as a diagnostic tool for potential multicollinearity within the regression model. Return on Assets (ROA) exhibits a weak positive correlation with Manufactured Capital Disclosure (0.0372) and Firm Size (0.0265), while maintaining a weak negative correlation with Natural Capital Disclosure (-0.0857). These coefficients, coupled with probability values exceeding the 0.05 threshold (0.7132, 0.7930, and 0.3962 respectively), indicate that no statistically significant linear relationship exists between the individual independent variables and the dependent variable at the bivariate level. Furthermore, the correlation coefficients among the independent variables, such as the relationship between NC and FS (-0.1391) or MC and FS (0.1184), remain well below the common threshold of 0.70 or 0.80. This absence of high inter-correlations suggests that multicollinearity is not a concern for the stability of the panel regression estimates, allowing each variable to contribute uniquely to the explanation of financial performance.

4.1.3 Multicollinearity Test

The test presented is a Variance Inflation Factor (VIF) analysis conducted on the study sample. Its objective is to assess whether any multicollinearity exists among the independent variables used in a regression model—specifically Natural Capital Disclosure (NC), Manufacturing Capital Disclosure (MC), and Firm Size (FS) which could compromise the reliability of the model's coefficients. Multicollinearity occurs when variables are highly correlated with each other, potentially distorting the estimated effects of each variable. The null hypothesis (H_0) for this test posits that no multicollinearity exists among the independent variables. The decision rule involves evaluating the Centered VIF values: if any variable has a Centered VIF greater than 10, the null hypothesis is rejected, indicating significant multicollinearity. If all values are below 10, the null hypothesis is accepted.

Table 5: Multicollinearity Test

Variance Inflation Factors
Date: 01/23/26 Time: 11:15
Sample: 2015 2024
Included observations: 10

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	329.12501	8.04450	NA
NC	1.267883	3.59023	1.690921
MC	2.426416	7.61167	1.826201
FS	6.308404	6.30001	1.953446

Source: E-views 12 Output (2026)

The Variance Inflation Factor (VIF) analysis is conducted to detect the presence of multicollinearity, which occurs when independent variables are too highly correlated to provide unique and reliable estimates in a regression model. Data from the table reveals that the centered VIF values for Natural Capital Disclosure (NC), Manufactured Capital Disclosure (MC), and Firm Size (FS) are 1.6909, 1.8262, and 1.9534 respectively. These values sit comfortably below the generally accepted conservative threshold of 5.0 and the more liberal threshold of 10.0, indicating that the variance of the estimated regression coefficients is not significantly inflated by correlations among the predictors. Low centered VIF results confirm that Natural Capital, Manufactured Capital, and Firm Size maintain sufficient independence within the model to allow for a precise estimation of their individual effects on Return on Assets. No problematic multicollinearity exists among the explanatory variables, which ensures that the standard errors are not distorted and the subsequent t-statistics remain valid for hypothesis testing.

4.1.4 Heteroskedasticity Test

The test conducted is the Panel Cross-section Heteroskedasticity Likelihood Ratio (LR) Test, applied to evaluate whether the residuals (error terms) from a regression model exhibit constant variance across different cross-sectional units. The purpose of this test is to detect heteroskedasticity, a condition where the variance of the residuals differs across observations, potentially distorting the accuracy of estimated coefficients and leading to unreliable inferences. The null hypothesis (H_0) posits that the residuals are homoskedastic, meaning they maintain uniform variance. The decision rule relies on a significance threshold of 0.05: if the p-value derived from the LR test is less than 0.05, the null hypothesis is rejected, suggesting the presence of heteroskedasticity; otherwise, the null is accepted.

Hypothesis:

Ho_1 The Error Variances are all Equal (Heteroskedastic)

Ho_2 The Error Variances are not Equal (Heteroskedasticity)

Decision Rule: the Null Hypothesis is not to be rejected if the P value is greater than 5% level of significance

Table 6: Heteroskedasticity Test

Panel Cross-section Heteroskedasticity LR Test
Equation: UNTITLED
Specification: ROA C MC NC FS LOGROA
Null hypothesis: Residuals are homoscedastic

	Value	df	Probability
Likelihood ratio	13.34734	10	0.1494

LR test summary:

	Value	df
Restricted LogL	72.51080	96
Unrestricted LogL	81.68447	96

Source: E-views 12 Output (2026)

The results of the Panel Cross-section Heteroskedasticity LR Test reveal a Likelihood Ratio (LR) statistic of 13.34734 with 10 degrees of freedom and a p-value of 0.1494. Since this p-value is greater than the 0.05 significance level, the analysis fails to reject the null hypothesis of homoskedasticity. This indicates that the residuals have a constant variance across the sampled firms, confirming that the model does not suffer from heteroskedasticity issues. Consequently, the standard errors are considered reliable, and the regression outcomes can be interpreted without the immediate need for further corrective robust standard error adjustments.

4.1.5 Hausman Specification Test

The statistical procedure performed is the Hausman test for correlated random effects, applied to evaluate the appropriateness of using a random effects model versus a fixed effects model in panel data analysis. This test is essential when analyzing longitudinal data involving repeated observations of firms where both time-series and cross-sectional variations are present. The objective is to check whether the unique firm-specific effects are correlated with the regressors included in the model; if they are, then a fixed effects model is preferable, as the random effects assumptions would be violated. The null hypothesis (H_0) posits that the random effects is not correlated with the regressors, and therefore the random effects model is appropriate. The decision

rule is based on the significance level of 0.05: if the p-value associated with the test statistic is below this threshold, the null hypothesis is rejected in favor of the fixed effects model; otherwise, it is accepted.

Hypotheses

H_0 Random Effect Model is more appropriate

H_1 Fixed Effect Model is more appropriate

Decision Rule

If Pvalue > 0.05, reject H_0, otherwise do not reject.

Table 7: Hausman Specification Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.785543	3	0.8529

Source: E-views 12 Output (2026)

In this case, the test produced a Chi-Square statistic of 0.785543 with 3 degrees of freedom and a p-value of 0.8529. Since the p-value exceeds the 0.05 threshold, the null hypothesis is accepted. This implies that there is no significant correlation between the random effects and the regressors, and the random effects model can be validly applied to the dataset. The justification for this conclusion lies in the relatively high p-value, which suggests that the observed differences between the estimates produced by the random and fixed effects models are not statistically significant. Thus, the random effects model is suitable and does not introduce bias resulting from correlated regressors and error components.

4.1.6 Lagrange Multiplier Test

The test performed is the Lagrange Multiplier Test for Random Effects, specifically applying the Breusch-Pagan method to determine whether a random effects model is appropriate for the panel dataset. The core objective of this test is to assess whether there are significant variances across firms (cross-sectional units) or over time that warrant using a model accounting for random effects, as opposed to a simpler pooled regression. The null hypothesis (H_0) states that no random effects exist neither across firms nor over time implying that a pooled ordinary least squares (OLS) model would be adequate. The decision rule follows conventional standards: if the p-value associated with any of the test statistics (cross-section, time, or both) is below the 0.05 threshold, the null hypothesis is rejected for that component, indicating the presence of random effects.

Table 9: Lagrange Multiplier Test

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	35.68619	0.207422	35.89361
	(0.0000)	(0.6488)	(0.0000)

Source: E-views 12 Output (2026)

The findings reveal that the test statistic for the cross-sectional component is 35.68619 with a p-value of 0.0000, while the joint test for both cross-section and time yields a statistic of 35.89361 with an identical p-value of 0.0000. In contrast, the time component has a test statistic of 0.20742 and a p-value of 0.6488. Based on these results, the null hypothesis is rejected for both the cross-section and combined components due to the extremely low p-values, confirming the existence of random effects across firms. However, the null hypothesis is accepted for the time component, suggesting no significant random variation over time. This outcome justifies the use of a random effects model that incorporates firm-specific heterogeneity but does not require additional modeling of time-based variation. The acceptance and rejection decisions are firmly grounded in the disparity

between p-values and the significance threshold, reinforcing the model's need to account for cross-sectional randomness while excluding time-related components.

4.2 Test of Hypothesis

The test conducted is a Panel Estimated Generalized Least Squares (EGLS) analysis with cross-section random effects, applied to assess the influence of selected independent variables on Return on Assets (ROA). The primary objective is to estimate how Natural Capital Disclosure (NC) and Manufacturing Capital Disclosure (MC) contribute to variations in ROA while accounting for firm-level heterogeneity. The null hypothesis (H_0) asserts that each independent variable has no statistically significant effect on ROA that is, their coefficients equal zero. The decision rule involves comparing the p-values for each variable's t-statistic to a conventional significance level of 0.05. If a variable's p-value is below this threshold, its null hypothesis is rejected; otherwise, it is accepted.

Ho_1: Natural capital disclosure has no significant effect on the corporate financial performance of listed downstream oil and gas companies in Nigeria.

Ho_2: Manufactured capital disclosure has no significant effect on the corporate financial performance of listed downstream oil and gas companies in Nigeria.

Decision Rule: if P value is less than 5%, it means the probability is significant and should be accepted. If it is more than 5%, it means is insignificant and should be rejected.

Table 8: Panel Regression Result (Random Effect)

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 01/23/26 Time: 12:59
Sample: 2015 2024
Periods included: 10
Cross-sections included: 10
Total panel (balanced) observations: 10
Swamy and Arora estimator of component variances
White period (cross-section cluster) standard errors & covariance (d.f. corrected)
Standard error and t-statistic probabilities adjusted for clustering

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.598528	0.045387	13.18716	0.0000
MC	-0.023029	0.008709	-2.644216	0.0267
NC	0.005574	0.007095	0.785603	0.4523
FS	-0.000239	0.003421	-0.069878	0.9458
LOGROA	0.508245	0.028587	17.77873	0.0000

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.035635	1.0000

Weighted Statistics			
Root MSE	0.034927	R-squared	0.912003
Mean dependent var	0.225772	Adjusted R-squared	0.908298
S.D. dependent var	0.118334	S.E. of regression	0.035834
Sum squared resid	0.121988	F-statistic	246.1470
Durbin-Watson stat	1.586109	Prob(F-statistic)	0.000000

Source: E-views 12 Output (2026)

The panel regression results, estimated using the Cross-section Random Effects method with White period robust standard errors, indicate that the model possesses a high explanatory power, as evidenced by an Adjusted R-squared of 0.9082. This suggests that approximately 90.8% of the variations in the Return on Assets

(ROA) of listed downstream oil and gas companies in Nigeria are explained by the variables included in the model. The F-statistic of 246.1470 with a corresponding probability of 0.0000 confirms that the overall model is statistically significant and fit for empirical inference. Furthermore, the Durbin-Watson statistic of 1.5861 lies within an acceptable range, suggesting that the results are not significantly distorted by autocorrelation.

Regarding the individual variables, the results reveal that Manufactured Capital Disclosure (MC) has a negative coefficient of -0.0230 and is statistically significant at the 5% level (p = 0.0267). This indicates that, within the context of this sampled period, an increase in manufactured capital disclosure is associated with a marginal decrease in Return on Assets. Conversely, Natural Capital Disclosure (NC) shows a positive coefficient of 0.0055, but with a probability value of 0.4523, it fails to reach statistical significance. Similarly, Firm Size (FS) exhibits a negative coefficient of -0.0002 and is statistically insignificant (p = 0.9458), suggesting that the asset base of the firm does not directly dictate profitability levels. The highly significant constant (p = 0.0000) implies that other factors not captured in this specific model continue to play a substantial role in determining the financial performance of firms in the Nigerian downstream petroleum sector.

4.3 Discussion of Findings

The findings of this study reveal a diverging impact of integrated reporting components on corporate profitability, specifically showing that Natural Capital Disclosure (NC) does not significantly influence the Return on Assets (ROA) of listed firms in Nigeria. This specific result for NC aligns with the work of Iliemena and Ijeoma (2019), who found no significant effect of environmental disclosure on return on capital employed among manufacturing firms, and Chiamogu and Okoye (2020), who reported an insignificant relationship between environmental remediation costs and earnings per share. These parallels suggest that the disclosure of natural resources and environmental impacts may be driven more by regulatory compliance than by immediate profit generation within the Nigerian downstream sector.

In contrast, the study finds that Manufactured Capital Disclosure (MC) exerts a statistically significant but negative influence on Return on Assets. This negative relationship implies that higher levels of reporting on physical infrastructure and technological investments are associated with a decrease in current profitability for the sampled firms. This finding is supported by the broader financial dynamics observed by Ismail et al. (2021), who noted that heavy capital commitments and liquidity management often weigh down the short term profitability of oil and gas firms. Furthermore, international perspectives from Nyirenda et al. (2018) suggest that the high costs associated with maintaining and disclosing manufactured assets may overshadow their financial benefits in the immediate term. Consequently, while integrated reporting aims to provide a holistic view of value creation, the empirical evidence suggests that the intensive management of manufactured capital currently poses a challenge to the asset efficiency of listed downstream companies in Nigeria

3. CONCLUSION AND RECOMMENDATION

This study investigated the effect of Natural Capital Disclosure and Manufactured Capital Disclosure on the financial performance of listed firms in Nigeria, using Return on Assets as the primary performance metric. Despite the theoretical relevance of integrated reporting, the empirical results revealed a divergent impact: Natural Capital Disclosure showed no statistically significant effect on financial performance, while Manufactured Capital Disclosure demonstrated a significant but negative relationship with asset returns. These findings align with prior studies reporting weak or inconsistent relationships between environmental and infrastructure disclosures and short-term profitability. The study therefore concludes that while natural capital reporting remains largely inconsequential to current earnings, the disclosure and management of manufactured capital appears to temporarily constrain asset efficiency, likely reflecting the front-loaded cost burden of long-term infrastructure investment.

Recommendations

i. Financial Reporting Council of Nigeria (FRCN)

The FRCN should enforce mandatory natural and manufactured capital disclosure standards aligned with the International Integrated Reporting Council (IIRC) framework, transitioning current voluntary practice into a binding reporting requirement. Sector-specific directives should require downstream petroleum firms to report carbon liabilities, environmental obligations, and infrastructure investment outcomes as standardised items within annual integrated reports, thereby improving the comparability and investor relevance of disclosed information.

ii. Securities and Exchange Commission (SEC) Nigeria

The SEC should incorporate integrated reporting compliance as a listing requirement on the Nigerian Exchange Group (NGX), making adherence to both natural and manufactured capital disclosure standards a condition for continued capital market access. This would reposition disclosure from a compliance formality into a credible signalling mechanism for long-term value creation, strengthening investor confidence in the sector.

iii. Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA)
The NMDPRA should develop standardised disclosure templates tailored to the operational realities of downstream petroleum firms, requiring forward-looking information such as projected asset utilisation rates, infrastructure upgrade timelines, and expected productivity gains alongside historical cost data. This would enable investors and stakeholders to contextualise capital expenditure as long-term wealth generation rather than a short-term drag on financial performance.

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APPENDIX

DATA PRESENTATION

Year	Firm	Firm ID	ROA	NC	MC	FS
2015	11 PLC	1	0.298	0	1	6.350
2016	11 PLC	1	0.093	1	0	6.376
2017	11 PLC	1	0.126	1	1	6.310
2018	11 PLC	1	0.279	1	1	6.271
2019	11 PLC	1	0.140	1	0	6.246
2020	11 PLC	1	0.208	1	1	6.230
2021	11 PLC	1	0.149	1	1	6.220
2022	11 PLC	1	0.407	1	1	6.186
2023	11 PLC	1	0.173	1	1	6.144
2024	11 PLC	1	0.283	1	1	6.129
2015	Eternal Plc	2	0.126	1	0	6.115
2016	Eternal Plc	2	0.131	1	0	6.115
2017	Eternal Plc	2	0.180	1	0	6.455
2018	Eternal Plc	2	0.513	1	0	6.549
2019	Eternal Plc	2	0.102	1	1	6.561
2020	Eternal Plc	2	0.265	1	1	6.591
2021	Eternal Plc	2	0.223	1	1	6.613
2022	Eternal Plc	2	0.258	1	1	6.635
2023	Eternal Plc	2	0.088	1	1	6.657
2024	Eternal Plc	2	0.173	1	1	6.705
2015	Conoil Plc	3	0.308	1	1	6.697
2016	Conoil Plc	3	0.130	1	1	6.708
2017	Conoil Plc	3	0.178	1	1	6.743
2018	Conoil Plc	3	0.280	1	1	6.820

2019	Conoil Plc	3	0.294	1	1	7.582
2020	Conoil Plc	3	0.069	1	1	7.664
2021	Conoil Plc	3	0.369	1	1	7.717
2022	Conoil Plc	3	0.091	1	1	7.732
2023	Conoil Plc	3	0.234	1	1	7.800
2024	Conoil Plc	3	0.239	1	1	7.880
2015	MRS Oil Nigeria Plc	4	0.327	1	1	8.029
2016	MRS Oil Nigeria Plc	4	0.333	1	1	6.489
2017	MRS Oil Nigeria Plc	4	0.157	1	1	6.533
2018	MRS Oil Nigeria Plc	4	0.149	1	1	6.692
2019	MRS Oil Nigeria Plc	4	0.130	1	1	6.700
2020	MRS Oil Nigeria Plc	4	0.372	1	1	6.800
2021	MRS Oil Nigeria Plc	4	0.300	1	1	6.830
2022	MRS Oil Nigeria Plc	4	0.206	1	1	6.931
2023	MRS Oil Nigeria Plc	4	0.137	1	1	7.083
2024	MRS Oil Nigeria Plc	4	0.235	1	1	7.127
2015	Oando Plc	5	0.314	1	1	7.187
2016	Oando Plc	5	0.199	1	1	5.974
2017	Oando Plc	5	0.116	1	1	6.031
2018	Oando Plc	5	0.182	1	1	6.242
2019	Oando Plc	5	0.345	1	1	6.294
2020	Oando Plc	5	0.269	1	1	6.277
2021	Oando Plc	5	0.171	1	1	6.367
2022	Oando Plc	5	0.117	1	1	6.453
2023	Oando Plc	5	0.210	1	1	8.795
2024	Oando Plc	5	0.256	1	1	8.914
2015	Aradel Holdings Plc	6	0.172	1	1	5.984
2016	Aradel Holdings Plc	6	0.351	1	1	8.046
2017	Aradel Holdings Plc	6	0.090	1	1	6.177
2018	Aradel Holdings Plc	6	0.309	1	1	6.207
2019	Aradel Holdings Plc	6	0.153	1	1	6.236
2020	Aradel Holdings Plc	6	0.241	1	1	6.261
2021	Aradel Holdings Plc	6	0.136	1	1	6.326
2022	Aradel Holdings Plc	6	0.297	1	1	6.412
2023	Aradel Holdings Plc	6	0.234	1	1	6.425
2024	Aradel Holdings Plc	6	0.116	1	1	6.487
2015	Total Energies Plc	7	0.675	1	1	5.800
2016	Total Energies Plc	7	0.068	1	0	5.834
2017	Total Energies Plc	7	0.194	1	1	5.822
2018	Total Energies Plc	7	0.157	1	1	5.855
2019	Total Energies Plc	7	0.267	1	1	5.859

2020	Total Energies Plc	7	0.133	1	0	5.896
2021	Total Energies Plc	7	0.352	1	1	5.677
2022	Total Energies Plc	7	0.145	1	1	5.239
2023	Total Energies Plc	7	0.212	1	1	5.508
2024	Total Energies Plc	7	0.206	1	1	5.381
2015	JAPAUL OIL	8	0.242	0	1	7.835
2016	JAPAUL OIL	8	0.269	1	1	7.968
2017	JAPAUL OIL	8	0.091	1	1	8.282
2018	JAPAUL OIL	8	0.169	1	0	8.581
2019	JAPAUL OIL	8	0.489	1	1	8.730
2020	JAPAUL OIL	8	0.092	1	1	8.790
2021	JAPAUL OIL	8	0.191	1	1	8.762
2022	JAPAUL OIL	8	0.478	1	0	8.699
2023	JAPAUL OIL	8	0.135	1	1	8.704
2024	JAPAUL OIL	8	0.143	1	1	8.728
2015	SEPLAT ENERGY NIG PLC	9	0.156	0	1	8.785
2016	SEPLAT ENERGY NIG PLC	9	0.325	0	1	8.839
2017	SEPLAT ENERGY NIG PLC	9	0.332	1	1	5.804
2018	SEPLAT ENERGY NIG PLC	9	0.059	1	1	5.782
2019	SEPLAT ENERGY NIG PLC	9	0.270	1	1	5.752
2020	SEPLAT ENERGY NIG PLC	9	0.185	1	1	5.805
2021	SEPLAT ENERGY NIG PLC	9	0.219	1	0	5.627
2022	SEPLAT ENERGY NIG PLC	9	0.151	1	1	5.481
2023	SEPLAT ENERGY NIG PLC	9	0.346	1	1	5.793
2024	SEPLAT ENERGY NIG PLC	9	0.145	1	0	5.784
2015	Forte Oil	10	0.121	0	0	6.235
2016	Forte Oil	10	0.510	0	0	6.001
2017	Forte Oil	10	0.187	0	1	6.145
2018	Forte Oil	10	0.069	1	0	6.385
2019	Forte Oil	10	0.504	1	1	5.804
2020	Forte Oil	10	0.107	1	1	5.804
2021	Forte Oil	10	0.176	1	1	5.782
2022	Forte Oil	10	0.357	1	0	5.752
2023	Forte Oil	10	0.118	1	1	5.805
2024	Forte Oil	10	0.507	1	1	5.627

Source: NGX Fact Book (2015-2024)