International Journal of Economics, Commerce and Management
United Kingdom ISSN 2348 0386 Vol. X, Issue 11, Nov 2022

http://ijecm.co.uk/

INTELLECTUAL & NATURAL CAPITAL AND FINANCIAL PERFORMANCE: EVIDENCE FROM LISTED MULTINATIONAL COMPANIES IN NIGERIA

LAMBE Isaac, PhD
Department of Accounting, Faculty of Administration, Bingham University,
Karu, Nasarawa State, Nigeria
talk2ice@yahoo.com

AME Jacob Ojobo, PhD
Department of Accounting, Faculty of Administration,
Nasarawa State University, Keffi, Nigeria
amejacob@nsuk.edu.ng

DZUGWAHI Haruna
Department of Accounting, Faculty of Administration, Bingham University,
Karu, Nasarawa State, Nigeria
hdbirdling@gmail.com

Abstract

The era of the industrial economy is being replaced by a knowledge-based economy; hence a paradigm shift from resource-based to knowledge-based. This study, therefore, examines the effect of intellectual and natural capital on financial performance of listed multinational companies in Nigeria. The study period spanned ten (10) years from 2012 to 2021 and the data used for the study were sourced from the published financial statements of the companies and the Nigerian Exchange Group (NGX). Twenty-four (24) listed multinational companies constitute the population and nineteen (19) of them were selected as a sample based on a study filter. The ex-post facto research design and positivist research philosophy were adopted, and the study is anchored on resource-based theory and diffusion of innovation theory. The dependent variable

of the study is proxied by Return on Equity (ROE) while Intellectual Capital (IC), and Natural Capital are the independent variables of the study. Revenue Growth (RG) is the control variable. Value Added Intellectual Coefficient (VAIC) measures intellectual capital. Natural Capital (NC) is proxied by Environmental Disclosure Index (EDI) in line with guidelines of the Global Reporting Initiative (GRI 2016). EDI is the average of all disclosures reported on eight parameters of environmental issues. Multiple regression with the aid of a statistical tool STATA version 16was used for the data analysis. The outcome of the study revealed that intellectual capital has a positive and significant effect on financial performance of listed multinational companies in Nigeria. On the other hand, natural capital has a positive but insignificant effect on financial performance. The study concludes that intellectual capital enhances financial performance. Therefore, the study recommends that there should be more investment in intellectual capital as it significantly improves financial performance. The policy implication is for the management of the companies to continue and sustain the best practice of recruiting highly competent staff using high-rated human resources consultants because such creates value for the business owners and other stakeholders in the short, medium, and long-term.

Keywords: Integrated Reporting (IR), Intellectual Capital (IC), Natural Capital (NC), Value-Added Intellectual Coefficient (VAIC), Environmental Disclosure Index (EDI)

INTRODUCTION

The age of the industrial economy is being replaced by a knowledge-based economy (Akintoye et al., 2022). Previous research has demonstrated that sustainable performance improvement cannot be achieved just via the use of material and financial capital (Zhang et al., 2021; Kasoga, 2020; Shahid et al., 2014). Higher-performance firms should use strategic resources, especially intellectual capital, to gain a competitive advantage. The extent to which knowledge and intellectual capital are efficiently utilized in our modern society becomes a key influential factor in influencing the financial performance of an organization (Chechet et al., 2020). Four different socio-economic phases have been experienced throughout human history which includes primitive society, agricultural society, industrial society, and the current information age (Yalama, 2013). Through these phases, the hierarchy of production factors varied from one enterprise to another. Knowledge, information technologies, and intellectual capital factors take priority in this information society, unlike the other phases that witnessed an extreme focus on traditional factors such as labour, capital, natural resources, and entrepreneurship (Yalama, 2013). Businesses are faced with stiff competition all over the world and to survive, hence different strategies on how to efficiently allocate resources must be

contemplated by decision-makers. Valuable resources are often rare, non-substitutable, and inimitable, and therefore empower a firm to sustain its competitive advantage and outperform its competitors. The most demanding factor for success, however, is the intangible resources of an organization (Winter & Szylanski, 2002). In fact, intangible resources of a company which includes skills, customer relationships, corporate culture and values, reputation, and so on, are indisputably more difficult to imitate by competitors.

The market value of leading organizations in the modern-day business world is much higher than their book value (Saeed et al., 2013). The difference between these values according to the study could result from intellectual capital which includes intangible assets as well as the presence of natural capital available for use by the company. These factors have caused an increasing gap between the market value and the book value of companies. The real value of an organization cannot be measured by traditional financial reporting (Yang et al., 2009). It is common knowledge that statement of financial position provides information on the actual value of an enterprise, useful for decision-making purposes. Moreover, the relationship between the data obtained from financial reports (which are produced in line with traditional accounting systems), and the value of an enterprise accounted for financial information only. In addition, traditional accounting systems failed to reflect intellectual and natural capital in creating value for enterprises (Lhaopadchan, 2010). Hence, stakeholders seek to find a method for evaluating internal intangible assets to determine the true value of their investment.

Researchers in some developing and developed nations have conducted studies on sustainability reports and the outcome of studies, especially from the developed countries have shown that sustainable capital (environmental/natural, social, human, and intellectual) accounting and reporting is an important ingredient of corporate success and that it can contribute more to firm's performance (Etimet al., 2022). According to them, environmental or natural capital reporting drives pricing and profitability, assists decision-makers to target cost reduction, reduces waste, and improves eco-efficiency. However, these are submissions that must be empirically subjected to testing to determine the effect of these factors on the performance of Nigerian firms.

Intellectual capital is defined as knowledge that can be converted to value. For organizations that do not recognize intellectual capital, there will always be an unaccounted gap between book value and market value. Intellectual capital is present in every business sector and is the most important factor in maintaining competitive advantage and value creation of a firm (Maditinos et al., 2011). Human capital, customer (relational) capital and structural capital are the three main components of Intellectual capital (Maditinos et al.,2011). Human capital refers to knowledge, skills, and experiences that employees take with them when they leave the

organization; structural capital includes all non-human resources of knowledge in the organization which consists of databases, organizational charts, procedures, administrative processes, strategies, and generally consist of everything that creates higher value for the organization other than its physical aspect. Customer capital is the knowledge that exists in marketing channels and relationships with customers, and it is a determinant factor in converting intellectual capital to market value.

Natural capital is the most fundamental of the core forms of capital since it provides basic conditions such as fertile soil, multifunctional forests, productive land and seas, quality freshwater, and clean air for human existence (EU, 2013). Put in a business perspective, natural capital is the inventory of mined, stored, or produced natural resources held by companies, such as water, gold, natural gas, silver, or oil. Natural capital explorers and refiners should adhere to environmental regulations which may include rules on exploration conditions and production locations to limit risk to the environment. In reality, companies, that are explorers and producers of natural capital spend a substantial amount of their expenses on recovery and protection measures which creates an expense level that affects the profitability of the company. Economic value and wealth in the modern-day business environment do not only include products produced by enterprises, but also intangible assets which are explained by intellectual capital (Chen et al., 2005). In essence, economic value and wealth are created using both the natural and intellectual capital accessible to an organization. According to Powell (2003), these two forms of capital could play a greater role in value creation. Studies revealed that sustainable performance improvement cannot be achieved using material and financial capital (Zhang et al., 2021; Kasoga, 2020; Shahid et al., 2014). Therefore, given the information age, performance measurements for a firm may not be possible with traditional accounting practices anymore. Hence a growing need to develop new methods taking account of natural and intellectual capital (Berzkalne & Zelgalve, 2014). This study investigates the effect of intellectual capital and natural capital on financial performance of firms taking evidence from listed multinational companies in Nigeria. The following hypotheses stated in their null form have been developed to address the question of the effect intellectual capital and natural capital have on financial performance of listed multinational companies in Nigeria:

H_{01}: Intellectual capital has no significant effect on financial performance of listed multinational companies in Nigeria.

H_{02}: Natural capital has no significant effect on financial performance of listed multinational companies in Nigeria.

The research assists in providing management of multinational companies in Nigeria with the real essence of ensuring quality sustainable environmental or natural capital reporting in the annual reports and as a would-be benchmark to these firms since intellectual capital and natural capital are important resources of an organization. The outcome of the study adds to the existing body of knowledge on the relationship between intellectual capital, natural capital, and financial performance.

LITERATURE REVIEW

Integrated Reporting

Integrated reporting provides financial and non-financial information that helps with informed decision-making. It is an explanation of how an organization's strategy, governance, performance, and prospects considering its external environment contribute to the generation of value over the short, medium, and long terms provided in an integrated report (Adegboyegun, 2020). Traditional corporate reporting's shortcomings, such as its failure to consider business models, reliance on historical data, and omission of the value created by employees, as well as investors' current perception that external corporate disclosure is insufficient for providing comprehensive information, gave rise to integrated reporting (Jhunjhunwala, 2014). Real-time data, simpler procedures, openness, and a more effective reporting system are all anticipated benefits of integrated reporting (IIRC, 2021; Farneti, 2019; Kosovic & Patel, 2013). The Integrated Reporting (IR) framework, which includes a strategic focus on future orientation and connectivity of information, provides the guiding principles for creating and presenting the integrated report. Relations with stakeholders, among other things (Jhunjhunwala, 2014). According to the IR Framework, capital can be classified as being financial, manufactured, intellectual, human, social, relationship, or natural (IIRC, 2021; IIRC, 2013). In this study, intellectual capital and natural capital are examined to determine their relationship with financial performance.

Intellectual Capital

Globalization has evolved from an industry-based economy to one based on knowledge, thereby keeping the focus of enterprises on developing their intangible assets to compete and produce value for long-term success (Gupta *et al*., 2020). A knowledge-based economy is defined as an economy in which development and expansion are driven by the generation, production, and utilization of knowledge (OECD, 1996). This knowledge is intangible in nature and comes in the form of intellectual capital. Intangible assets include employee skills, research and development, systems, and databases that provide a competitive advantage (Ahmed *et al.,*

2019). Despite the significant role of intellectual capital in a firm's wealth creation, it is not captured in the statement of financial position as intellectual capital (Xu & Liu, 2020).

Intellectual capital has been defined by different scholars in different ways, but there is no consensus as to which definition best describes the concept of intellectual capital. However, according to Mondal and Ghosh (2012), intellectual capital can be seen as intangible assets which are not listed explicitly on a firm's statement of financial position which influences financial performance. Cuozzo *et al.* (2017), opined that intellectual capital is value not only in monetary gain but also includes environmental, social, and economic matters. Shahwan and Habib (2020) defined intellectual capital as the sum of all employee competencies and skills that generate wealth for the firm. This study aligns with the definition of Shahwan and Habib (2020) since the different components of intellectual must work together. In adopting this definition, disaggregating intellectual capital does not provide much value. Intellectual capital is a driving force behind the financial performance of non-financial firms (Shahid *et al*., 2022). Value Added Intellectual Coefficient (VAIC) was developed by Pulic in 2000, in which he said, in discussing the company's non-physical added value, the term "intellectual capital" is used. There are three types of capital: structural, relational, and human. Skills, expertise, and training fall under the category of "human capital," while relationships with customers, stakeholders, brands, and agreements fall under "relational capital," and systems, work environments, and company culture fall under "structural capital."(Stahle et al., 2011). Investment in intellectual and physical capital allows companies to optimize their financial performance by maximizing resource utilization.

The concept of intellectual capital encompasses three components which are human capital, structural capital, and customer capital. Human capital is the various know-how that leaves an organization when people leave, and it includes the skills, capabilities, experience, and expertise of employees. Structural capital covers the system, structure, and processes of an organization and it involves non-physical components such as databases, organization charts, management processes, and business strategies. However, customer capital refers to all intangible assets which regulate and manage the relationships of an organization. It comprises the organization's relationships with its customers, suppliers, shareholders, and other stakeholders (Joshi *et al.,* 2013).

Natural Capital

Natural or environmental capital accounting and reporting is currently a global issue because of the need for sustainability and preservation of natural resources and the minimization of the externalities associated with the exploration and exploitation of bio-sphere

assets (Etim*et al.*, 2022). This accounts for the overwhelming increase in the number of studies that have been carried out on sustainable capital reporting in recent years concerning the environment, social, human, and intellectual capital. Kalash (2020) asserted that corporate environmental performance has become a more important issue to stakeholders because of the harmful impact of a firm's operations on the environment. Industrial activities bear primary responsibility for climate change and global warming with their attendant disastrous consequences. As a result, society and the government are mounting pressure on firms to disclose more environmental information, and to adopt a production strategy that improves environmental performance, provides low-carbon products, and reduces greenhouse gas emissions and environmental pollution (Lu & Abeysekera, 2014). In response to these pressures, environmental issues are increasingly considered in firms' activities (Kalash, 2020).

Although companies have an important role to play in nation-building, the economic activities of these companies also portend great discomfort to the immediate environment which culminates in social disputes that causes disruption of their operations and in turn affect performance (Okegbe & Ofurum, 2019). In the past, corporate organizations placed much emphasis on profitability, without recourse to the environment in which they operate (Charles & Muyiwa, 2022). Ndifon *et al.* (2014) opined that a major challenge in the world is the systemic destruction of the environment, which can destroy the entire world if not properly controlled. This, therefore, led to the enactment of various laws and regulations to control environmental problems in Nigeria. These laws expect companies to be conscientious and exhibit a high sense of responsibility by correcting the negative impact of their operations on the environment and society at large. Non-compliance to rules and regulations often culminate in health hazards, disturbance of land and marine ecosystem, economic problems, and disputes between firms and host communities, which in turn affect firms' financial performance. Emakponuzo and Udih (2015) attributed non-compliance with these regulations to weak infrastructure, technology deficits, and high levels of corruption in society. The attitude of several firms not to consider environmental costs makes financial performance below expectations (Sengottuvel, 2018).

Sustainable capital reporting discloses environmental, social, and governance (ESG) as it affects a firm's performance, society, and the economy (Kalash, 2020). Such reporting according to them enhances firms' reputation, reduces information asymmetry, and reduces agency costs and cost of capital. All these benefits encourage managers to be forthcoming and to present good environmental behaviour. Besides these benefits, the concept of legitimacy theory obligated firms to disclose environmental information to legitimize their activities and operations within society. In the framework of information cost theory, the environmental disclosure decisions are subject to a trade-off between the benefits and costs of information

disclosure which may impact the financial position of the company if not properly designed (Dejean, 2009). In Brammer and Pavelin (2006), it was asserted that firms disclose more information when benefits exceed costs and that these costs will always relate to collating, confirming, measuring, and publishing information. Hence, to avoid proprietary costs that could be incurred when firms disclose private information, managers would not disseminate private information that could be used by stakeholders, which will negatively affect the firm's value (Guidry & Patten, 2012). This study has used natural or environmental capital synonymously.

Financial Performance

Performance is an indicator of a survivor for an organization. It can be viewed in terms of how economically, efficiently, and effectively the resources of the organization have been used to achieve its goals (Nwaimo, 2020). Performance borders on the evaluation, comparison, and assessments of the administrative activities, practices, and management policies; obtaining maximum useful output from the resources devoted to each activity and ensuring that output from any given activity is achieving the desired results (Charles & Muyiwa, 2022). Simply put, organizational performance describes an organization's ability to attain its goals by using resources efficiently and effectively. Organizational performance is the ability of an organization to achieve its goals and objectives (Birley & Westhead, 2013). The performance of a firm is pointed out in three specific areas - financial performance, market performance, and shareholders returns (Nwaimo, 2020). This study focuses on the financial performance of the firm.

Financial performance explains the measurement of the financial health of an organization over time (Farrukh & Faizan, 2016). Financial performance is a measure of stewardship reported to investors by the management. Hence, financial performance could be viewed from the difference between the starting point of a business concern and the target points within a space of time (Charles & Muyiwa, 2022). According to Magara *et al.,* (2015), financial performance could be measured in different ways, including profitability, market share growth, return on investment (ROI), return on equity (ROE), and liquidity. The Institute of Chartered Accountants of Nigeria Study Pact on Performance Management (2019) averred that the financial performance of a firm could be computed in various ways, like net profit margin (NPM), gross profit margin (GPM), earning per share (EPS), and other performance measures. In this study, financial performance was measured by returns on equity (ROE).

Return on Equity

Return on Equity (ROE) effectively measures how much profit a company can generate on the equity capital investors have deployed in the business and can be used over time to

evaluate changes in a company's financial situation (Zhang et al. 2021). Adam (2016), sees a return on equity as the company's annual net income after taxes (excluding non-recurring items), divided by the average shareholder equity. Net Income in this sense is the amount of profit that a company has made after all expenses and taxes are deducted from revenues. Return on equity can provide valuable insight into a company's operations. Return on Equity indicates the amount of earnings generated by each naira of equity. In general, the higher the ROE the better, as high ROE companies, all other things being equal, will produce more earnings and free cash flow that can be used to support a higher level of growth, keep the company financially strong, and provide cash returns to shareholders.

To understand what drives a company's return on equity, it is possible to break down return on equity into several parts, deconstructing the ratio of Net Income to Shareholder Equity into other ratios to evaluate how each affects the company's total return on equity. Such deconstruction illustrates how return on equity works alongside some of the other measures when performing further due diligence on a company. Return on equity is one of the all-time favourites and perhaps the most widely used overall measure of corporate financial performance (Monteiro, 2006). ROE is popular among investors because it links the income statement to the statement of financial position. The fact that return on equity represents the result of structured financial ratio analysis, called DuPont analysis, also contributes to its popularity among analysts, financial managers, and shareholders alike. DuPont analysis help deduces whether it is profitability, utilization of assets, or debts that are driving return on equity (Stowe *et al.,* 2002).

Revenue Growth

Revenue is the total amount of income generated by the sale of goods or services related to the company's primary operations (Charles & Muyiwa, 2022). Revenue is often referred to as the top line because it sits at the top of the income statement. The revenue in value is the income a company generates before any expenses are subtracted. Revenue growth is the amount of money a company makes over a pre-determined time compared to the previous, identical amount of time (Kasogo, 2020). Companies would always come up with a revenue growth strategy that edges their competitor to help them improve performance. A revenue growth strategy is a plan for increasing revenue over both the short and long term. Every company has different needs, so each revenue growth strategy will be different. In developing a revenue growth strategy, all marketing, sales, and customer experience teams are aligned, communicating, and working cohesively (Charles & Muyiwa, 2022). This may require

using an all-in-one platform to streamline communication and work to keep things moving smoothly between teams.

Empirical Review

Aluwong (2022) investigated how intellectual capital has impacted firm performance in Nigeria drawing samples from listed non-finance firms on the floor of the Nigerian Exchange Group market from 2011 to 2020. The study proxied firm performance by return on asset (ROA) and the independent variables adopted for the study include structural capital efficiency (SCE), capital employed efficiency (CEE), human capital efficiency (HCE), and value-added intellectual capital coefficient (VAIC). In line with related extant literature, the variable of leverage was employed to control the model. Panel fixed and Random effect regression techniques were used as an econometric method for analysis. The empirical result of the study showed that out of the four independent variables adopted in the study, only human capital efficiency insignificantly affects the performance of listed non-finance firms in Nigeria. It was concluded that structural capital efficiency, capital employed efficiency, and value-added intellectual coefficient significantly improve firm performance. On the bases of these findings, the recommendation was made that managers should place great emphasis on structural capital. Investment in human capital instruments through continuous learning and training should be prime in the mind of decision-makers. Therefore, managers should provide more resources for the proper training of employees and ensure that the right persons are selected for the jobs. The study disaggregated intellectual capital when in reality greater value is achieved when aggregated (Shahwan & Habib, 2020).

Etim *et al*. (2022) studied the effect of natural/environmental capital reporting on the corporate profitability of manufacturing firms in Nigeria. Twenty-three (23) firms that engaged in industrial and natural resources processing were selected for the study. An ex-post facto research design was adopted in the study involving the generation of data from the annual reports of these firms using a content analysis checklist. The study period was from 2009 to 2018. The environmental/natural capital index (scores) were generated using seven (7) items in line with the contents of the integrated report issued by the International Integrated Reporting Council (IIRC). Data obtained were analyzed using descriptive and simple linear regression of the ordinary least squares (OLS) technique. The profitability of manufacturing firms was proxied by Return on Assets (ROA). Results revealed that environmental/natural capital reporting (ER) has a significant negative effect on ROA. The study concludes that environmental and natural capital enhances financial performance of manufacturing firms in Nigeria. The study recommends that in line with global best practice, regulatory agencies in Nigeria issue reporting

standards that would make reporting of all sustainable capital items and particularly environment/natural capital mandatory. The study concentrated on manufacturing firms; integrated reporting disclosures are sensitive to sectoral differences (Matemane & Wentzel, 2019).

Esy and Heri (2022) investigated the relationship between intellectual capital and financial performance of Sharia Commercial Banks in Indonesia. Using the value-added intellectual coefficient (VAIC), the study measured the efficient performance of Islamic banking in Indonesia. Also, the study examined the relationship between the efficiency of Intellectual Capital and Financial Performance. Secondary data were collected from quarterly reports for 2015 to 2020 on state-owned banks (BUMN) Islamic Banks; BNI Syariah, Bank Syariah Indonesia, BRI Syariah, and Bank Mandiri Syariah. Structural Equation Modelling using Partial Least Square (PLS) analysis was employed to analyze data. The study found that intellectual capital affects the financial performance of Islamic banks. The study concluded with empirical evidence that optimal utilization of intellectual capital and resources leads to higher bank profitability. It was recommended therefore that Islamic banks desiring to improve financial performance should focus on improving the intellectual capital of the organization. Data from a country like Indonesia will not generate results that can apply to a developing country like Nigeria, because of country-specific differences including legal and cultural.

Scholars have examined the relationship between environmental disclosure and bank performance, for instance, Munjal and Malarvizhi (2021) study of the effects of environmental performance on financial performance in the Indian banking sector for the years 2013to 2014 and 2017 to 2018 provides evidence for this. Eighty-three (83) Indian banks were used as a sample for the secondary data. The study used content analysis to extract data on environmental disclosures from the financial statements that had been independently reviewed. Disclosures on compliance, E-waste, emissions, energy, material, products and services, and water are used to estimate environmental performance. Return on assets (ROA) and return on banks equity were used to measure financial performance (ROE). Using a hierarchical multiple regression model, the relationship between environmental performance and financial performance was examined. Firm size, financial leverage, and capital intensity were the study control variables. The financial performance of Indian banks and their environmental performance are not significantly correlated. The study concludes that environmental disclosures have not significantly affected financial performance. Based on the outcome of the study, environmental performance by way of disclosure on compliance, E-waste, emissions, energy, material, products and services, and water has affected financial performances of banks in India insignificantly. Since banks act as middlemen in the financing of different economic

sectors, the risk posed by climate change compels them to assess their environmental performance to ensure sustainability. However, the analysis time frame covers only 2013 and 2014, 2017 and 2018 having a piece of updated information provides greater insight into the relationships being examined.

Tahir *et al*. (2021) examined the effect of intellectual capital on the financial statements of Pakistani banks from 2007 to 2015. By the end of 2015, exactly forty-four (44) banks were functioning throughout Pakistan, of which twenty-four (24) institutions were chosen as a sample. Twenty (20) mainstream banks and four (4) Islamic banks made up the sample. Because the remaining twenty (20) banks lacked the necessary data, they were not included. From 2007 to 2015, the data used in this investigation. Data was extracted from yearly reports that the involved banks had posted online. Numerous research has examined the connection between intellectual capital (IC) and bank financial success. This study from 2007 to 2015 uses the Value-added Intellectual Coefficient (VAIC) to assess the twenty-four (24) banks (split into two groups kinds)' intellectual capital efficiency, and it demonstrates how intellectual capital affects the financial performance of Pakistani banks. According to the study's findings, Human Capital Efficiency (HCE) in Pakistan largely affects banks' financial performance. HCE is more effective in adding value to the Pakistani banking sector than the other two VAIC components Capital Employed Efficiency and Structural Capital Efficiency (CEE and SCE). The implication is that banks should employ their human resources to increase their level of profitability. Capital Employed Efficiency (CEE) and Structural Capital Efficiency (SCE) have no beneficial effects on the financial health of banks. The Value-added Intellectual Coefficient (VAIC) technique may be helpful for banks and policymakers in a knowledge economy to incorporate intellectual capital in the decision-making process. The study's time gap, which would cover the 2016 to 2020 fiscal years, might bring the work up to date. Furthermore, bringing in non-banking firms provides information in understanding how these disclosures affect non-financial companies.

Chechet *et al.* (2020) investigated the impact of Intellectual Capital (IC) on the financial performance (FP) of listed Nigerian deposit money banks (NDMBs) for the years 2013 to 2017. Secondary data came from the financial institutions audited financial reports. The return on asset (ROA) served as a measure of financial performance, and the Value-Added Intellectual Coefficient (VAIC) model of Pulic (1998) was used to assess the various intellectual capital (IC) components, including capital employed efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency (SCE). Twelve banks were chosen as the study samples, and the study's population includes all 14 of the NDMBs indicated Multiple regression analysis was used to evaluate the four hypotheses at the 5% level of significance. The resource-based theory was applied. The study's findings demonstrate that IC in aggregation (VAIC) significantly improves

NDMBs' Return on Assets (ROA). The individual study of IC components, however, yields a variety of findings. SCE shows a substantial inverse association with Return on Assets (ROA), whereas capital employed efficiency (CEE) and human capital efficiency (HCE) show a significant inverse link with NDMBs' ROA. The study concludes that intellectual capital and human resources are crucial for the profitability and competitiveness of NDMBs. The study so suggested, among other things, that NDMBs desiring to further enhance their financial performance should concentrate more on enhancing their intellectual capital. The study, contrary to reality, disaggregated intellectual capital while aggregating provides more information (Shahwa & Habib, 2020).

Kalash (2020) investigated the determinants of public disclosure of environmental information by firms and its effect on their financial performance. Using a sample of 66 firms listed on the Istanbul Stock Exchange between 2014 and 2018, it was found that highly leveraged and larger firms and firms with higher equity agency costs are more likely to disclose environmental information. The Turkey climate change reports were used to measure the dependent variable (environmental disclosure) which is a binary variable. Because of the binary character of the dependent variable, a binary logistic regression model was used to test the hypotheses related to the first question. The model predicts whether the firm characteristics will affect the probability that the firm will disclose environmental information (the firm will belong to G1). As a deviation from the approach to model building from previous studies, the researcher used four measures of financial performance as a dependent variable (return on assets, return on equity, operating profit margin, and stock returns). The ordinary least squares (OLS) regressions were estimated to determine the effect of environmental disclosure on financial performance. The result of the test concluded that profitability, industry type, information asymmetry, investment opportunities, and business risk do not affect the probability that the firm will disclose environmental information. It was discovered that the environmental information disclosed has a weak impact on the financial performance of companies in Turkey. Despite the outcome of the study companies are encouraged to disclose environmental issues to meet the information needs of the diverse stakeholders of companies in Turkey. The study results could have been influenced by the political instability at the time. Furthermore, country-specific differences affect this relationship (Matemane & Wentzel, 2019).

Sudha (2020) investigated the connections between company environmental performance and financial performance in India using eco-efficiency indicators. The PROWESS database, the Centre for Monitoring Indian Economy (CMIE) from 2002 to 2011, served as the source of secondary data for two hundred and twenty-four (224) Indian S & P 500 firms. Return on assets (ROA), return on equity (ROE), and return on sales (ROS)were used as proxies for

corporate financial performance. Earnings per share (EPS), company size (SIZE), leverage (LEV), and R&D intensity (RDI)are the control variables. The independent variables are the polluting industry dummy (POLDUM), the energy and water intensity (ENWI), and the material intensity (MATI). The statistical tool STATA12 software was used to analyze the data using the panel data regression model. The results of the study demonstrate a favourable relationship between financial performance and energy, water, and material efficiency. At the individual level, the material intensity had a good impact on return on assets (ROA) and return on sales (ROS), while energy and water efficiency had a considerable impact on both. In conclusion, long-term corporate financial performance (CFP) is impacted by eco-efficiency based on corporate environmental performance (CEP). The study concludes that environmental performance positively affects financial performance. The study, therefore, recommends compliance to comply with the disclosure requirements of the Global Reporting Initiative (GRI) on environmental matters. It is equally, important to abide by national laws and regulations in India. The policy implication of the study is that companies should give full disclosures on company activities including reporting on environmental information; because it was empirically established that, environmental performance improves the financial performance of companies in India both in the short and the long run. The Global Reporting Index provides several more matrices than those provided by PROWESS as used in this study. The data collected using GRI with updated information may give a clearer picture of the relationship between the variables examined.

Oyedokum and Saidu (2018) examined how intellectual capital affected the financial performance of the listed Nigerian oil marketing companies. The study covered a 10-year time frame from 2007 to 2016. Market-to-book value ratio (MB), Value Added Intellectual Coefficient (VAIC), and the Monetary Model of Tobin's Q (MMQR) were used to quantify intellectual capital, whereas the return on asset was used to measure financial performance (ROA). Data were gathered from the published financial accounts of the companies using the ex-post facto research design. The influence of intellectual capital on financial performance was assessed using multiple regression analysis. The results of the study showed that market-to-book value had a considerable adverse influence on return on assets. The return on the asset is not significantly influenced by Tobin's Q monetary model, and it is not significantly influenced by the value-added intellectual coefficient either. According to the study's findings, intellectual capital has had little effect on the financial performance of the listed Nigerian oil marketing companies. The study concludes that intellectual capital insignificantly impacted financial performance. The study, therefore, advised the listed Nigerian oil marketing companies to invest more in the various components of intellectual capital, particularly human, structural, and relational capital,

to promote stakeholder/community relationships which may enhance performance in the medium or long-term operations of the companies judging the politically volatile nature of the oil and gas industry.

Yilmaz and Acar (2018) used data from Turkey to analyze how intellectual capital affects financial performance and market value. The information is comprised of the financial and market data for the production companies included in the Borsa Istanbul 100 index (BIST-100) for the years 2011 through 2014. Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM) are three different indicators of financial performance, and the Market to Book Ratio is one measure of market value. Modified Value-Added Coefficient (M-VAIC), followed by its three components (human capital, relational capital, and physical capital), are used as independent variables. The natural logarithm of assets was examined to account for company-specific asset size variance. The result reveals that human capital and physical capital have a significant impact on financial performance, whereas relational capital and physical capital have a big impact on market performance. The study also shows that models for predicting market performance are less reliable than those for predicting financial performance. The study concludes that intellectual capital drives the financial performance of companies. However, the analysis time frame covers only 2013 and 2014, 2017 and 2018 having updated information provides greater insight into the relationships being examined. The study suggests allocating financial resources to intellectual capital because it has a beneficial impact on companies' financial performance. The control variable (s) that are crucial in data analysis were not considered. The study could have been extended to 2017 which may have impacted the outcome of the study.

Kosovic and Patel (2013) examined the benefits of integrated reporting among South African listed companies for the period 2009 to 2011. Out of the four hundred and thirty-four (434) listed companies, one hundred and forty-two (142) were chosen after the filtering system. Secondary data from integrated annual reports from 2009 and 2011 were used in the study. To indicate value relevance, an Olhson valuation model and a self-made disclosure index comprising environmental and social characteristics were used. The Mann-Whitney U- and T-tests, as well as correlation estimation, were used to assess the study's hypotheses. The result shows that South Africa's level of compliance disclosure increased between 2009 and 2011. Furthermore, the result revealed that integrating social and environmental reporting increases a company's market value. The study concludes that the adoption of an integrated reporting system significantly influences the market value of companies in South Africa. The study suggested that companies should sustain the practice of an integrated reporting system, a such system of reporting positively impacted the companies value in South Africa. South Africa is a

pioneer country that made integrated reporting (intellectual capital and natural capital inclusive) mandatory by all companies. A study of the relationship between these variables in Nigeria will provide a greater understanding of the extent to which intellectual/natural capital affects firm performance, particularly since companies in Nigeria disclose these issues voluntarily.

Theoretical Framework

This study considers the diffusion of innovation theory, information cost theory, stakeholder theory, and resource-based theory to establish the relationship between intellectual/natural capital and financial performance.

Diffusion of Innovation Theory

One of the earliest social science theories is the Diffusion of Innovation (DOI) Theory, which was created by E.M. Rogers in 1962. It first appeared in communication to describe how an idea or product gathers steam and diffuses (or spreads) within a particular population or social system over time. There are four main interacting elements of the key concept: Diffusion of Innovations - 1) an innovation, 2) communicated through certain channels, 3) over time and 4) among members of a social system. The diffusion of innovation theory explains the rate at which consumers will adopt a new product or service (CFI, 2022). Depending on the category of adoption of a new idea, comprises innovators, early adopters, early majority, late majority, and laggards (CFI, 2022). Diffusion is a social process that occurs among people in response to learning about an innovation (Dearing& Cox, 2018). Recent developments in management accounting have occurred often, and practitioners are particularly interested in how these new technologies spread throughout firms (Shahid *et al.,* 2014). Thus, it is necessary to investigate how accounting innovation is disseminated to establish a foundation for its adoption in organizations. Innovation is a term used to describe an idea or behaviour that an individual or other unit of adoption perceives as being novel to the system (Rogers, 1995). How quickly new knowledge and technology spread throughout a particular population or civilization is explained by the diffusion of innovations theory. The rate and degree of adoption for each unit, however, are impacted by several factors. The goal of diffusion of innovation is to identify the elements influencing the dissemination curve of innovation through time (Nizar, 2016). The accounting practices used in Nigeria are very recent, and integrated reporting is one of them. Intending to generate value throughout the short, medium, and long terms, this reporting method combines six capitals-financial capital, manufactured capital, intellectual capital, human capital, social and relationship capital, and natural capital into a single report (IIRC, 2021, IIRC, 2013). Integrated reporting is an innovation in reporting that is diffused through Value Reporting Foundation, now

consolidated into International Financial Reporting Standards (IFRS) Foundation (VRF, 2022), which companies are all likely to adopt.

Information Cost Theory

Bar-Gill and Ben-Shahar (2021) assert that information costs have an impact on the creation of optimal defaults. People are considered to stay ignorant in situations where knowledge costs rise, and they have the choice to choose the uninformed opt-out option if doing so will improve their expected reward. When parties are informed, the criteria are met at the best possible position. a system established to monitor the significant participants' informed preferences. or the rule that optimizes anticipated rewards. While the usual, low information-costs analysis focuses on educated opt-out, the study focused on ignorant opt-out when information costs were high. In both circumstances, the objective is to reduce the incidence of opt-out. Brillouin (2013) assets that a greater range of fields are using developed information theory. The fundamental idea behind transaction cost theory is that businesses prefer to transact business through channels with reduced transaction costs. Hsieh (2016). The level of information costs, in conjunction with the nature of the global environment's volatility, determines the multinational firm's most effective organizational structure (Casson, 1999). According to Denti (2022), the price of information acquisition varies according to the type of experiment carried out. Information costs are expenses incurred by a person or a business while gathering data to use in making a financial decision. If these expenditures are substantial enough, they may have an impact on a company's profitability or the value of a customer's purchase (Zhang, 2020). The cost of acquiring natural and intellectual capital can have an impact on how well-listed multinational companies do financially in Nigeria. This may make this theory not applicable in the short run because integrated reporting certainly brings additional cost in the short run but could be beneficial in both the medium and long-term operations of the firm.

Stakeholders Theory

Edward Freeman introduced the stakeholder theory in 1984. Stakeholders are anybody or anything who has an impact on or has the potential to have an impact on the company (Abanyam*et al.,* 2020). Shareholders, management, staff, customers, suppliers, and the community are a few examples of stakeholders (Ovidiu & Ciprian, 2022). According to the stakeholder theory, a company's operations have an impact on its stakeholders, and as a result, they are responsible to them all (Abanyam*et al.,* 2020). The realization of value for all stakeholders forms the theoretical foundation (Ame, 2021). However, Charles Blatter contends

that balancing the interests of several stakeholders is difficult (Abanyam*et al.,* 2020). An integrated report offers thorough information to satisfy the information needs of many stakeholders and adds value to the business (IIRC, 2021; Farneti*et al.,* 2019; Ofoegbu *et al.,* 2018; Dagiliene & Nedzinskiene, 2018; Kilic & Kuzey, 2017).

A stakeholder-oriented approach to Corporate Social Responsibility (CSR) emphasizes that organizations exist within large networks of stakeholders, all of which stake claims on organizations (Theaker, 2004). Stakeholder engagement has been listed as a central aspect of assessing the standard of CSR, alongside aspects such as stakeholder commitment, management system, reporting, audit, and certification (Tencati *et al.,* 2008). In the light of these two fundamental principles, a stakeholder can be defined in the following slightly more precise way: A stakeholder of a corporation is an individual or a group that either is harmed by, or benefits from, the corporation; or whose rights can be violated, or must be respected by the corporation. It is said that a company has primary stakeholders, that is, stakeholders that are critical for the company's continued existence, and secondary stakeholders that are affected, directly or indirectly, by the company's decisions (Rosam & Peddle, 2004). A stakeholder-oriented approach to CSR emphasizes that organizations exist within large networks of stakeholders, all of which stake claims on organizations. Within the organization, the interests of these various stakeholders meet and interact with one another and the organization's interests. When organizations face demands from stakeholders to recognize the importance of CSR, they generally translate those demands into CSR objectives and develop CSR policies for the stakeholders. An integrated reporting of which intellectual capital and natural capital are an integral part of the reporting system that communicates concisely to all stakeholders of the business geared toward value creation to all of them (IIRC, 2021).

Resource Based Theory

Barney (1999) propounded resource-based theory. According to the resource-based approach, a company's reputation and image are intended to maintain its competitive advantage through the effective and efficient use and management of both tangible and intangible resources (Baye *et al.,* 2014). Value added is recognized as a legitimate indicator of a company's performance. Morris *et al.* (2010) established that resource-based theory in a portfolio of resources is the conceptualization of the resource-based theory of firm resources in a situation where the quality and availability of the number of resources in a portfolio is the primary factor in determining organizational performance. The resource-based view being a theoretical perspective of strategic management follows strictly difficult-to-imitate features of a firm that are fundamental drivers of organizational performance (Schulze, 1992). Resource-

based view approaches strategic analysis through an entire process that corresponds with the concepts of integrated reporting rooted in the six capitals (financial, manufactured, intellectual, human, social and relationship, and natural) available to a firm (Abeywardana *et al.,* 2021). According to the International Integrated Reporting Foundation (IIRF), organizational success depends on the available resources which in finance are called capital. Capital is the input of the business model process and transforms into outputs that determine the level of performance and perhaps acceptability in the marketplace. The resource-based theory is related to this study to explain how the availability of intellectual capital and natural capital influences the performance of listed multinational companies in Nigeria. It was established in the diffusion of innovation theory that the information on intellectual and natural capital is diffused through the Value Reporting foundation to all stakeholders. The stakeholder theory assumes that the interests of all parties are considered in company policymaking and implementation. The study is anchored on the diffusion of innovation theory and resource-based theory because the resources, intellectual capital, and natural capital are the resources of the organization when harnessed would add value to stakeholders in the short, medium, and long-term in line with the goal of integrated reporting, which is the new innovation.

METHODOLOGY

This study adopted an ex-post facto research design as it used observations based on existing data and information, that is independent of the researcher's interference or manipulation. Positivism research philosophy was adopted against the backdrop that the researcher remained independent in the research process and data were collected as well as variables operationalized and measured objectively. The population of the study is twenty-four (24) listed multinational companies on the Nigerian Exchange Group (NGX) as of 31st December 2021. In sampling, five companies were removed from the study based on pre-determined criteria for selection. In other words, purposive sampling was adopted as a method. Therefore, nineteen (19) sampled listed multinational companies were used for the study. The secondary data were sourced from the published financial statements of the companies and the Nigerian Exchange Group (NGX). Panel data was used because it takes into consideration a cross-section of multinational companies in twelve (12) sectors of the Nigerian Exchange Group (NGX) and time series for ten years (10) from 2012 to 2021. The rationale for selecting the year 2012, is the period the Federal Government of Nigeria approved the implementation of international financial reporting Standards (IFRS). The IFRS is the global best practice that supports full disclosures of information by entities in the public interest and for all stakeholders. The period of 2021 year is the latest period companies' financial statements were made public

as approved by the Nigeria Securities and Exchange Commission (SEC) and the Nigerian Exchange Group (NGX). The data were analyzed using multiple regression techniques to evaluate the effect of intellectual and natural capital on the financial performance of listed multinational companies in Nigeria. STATA 16 statistical tool was used to aid the analysis.

Model Specification

The study adopts the regression model used by Sudha (2020) and is represented as follows:

$ROE_{it} = \beta_0 + \beta_1 IC_{it} + \beta_2 NC_{it} + \beta_3 RG_{it} + \varepsilon_{it}$…….. (1)

Where:

ROE= Return on Equity

IC= Intellectual Capital

NC = Natural Capital

RG = Revenue Growth

$\beta_0 - \beta_{it}$ = coefficient of the regression

i = number of multinational companies

t = number of years

ε = Error term.

Dependent Variable: The dependent variable financial performance is proxied by Return on Equity (ROE).

Independent Variables are Intellectual Capital (IC)and Natural Capital (NC).

The control variable is proxied by Revenue Growth (RG).

Table 1 below shows the study variables and their measurements.

Table 1 Study Variables Measurement

Variable	Proxies	Measurement	Source(s)
FP	Return on Equity (ROE)	The ratio of Profit After Tax (PAT) to Total Equity (TE).	Zhang *et al.* (2021). Nailal and Rika (2016).
IC	Intellectual Capital	Value Added Intellectual Coefficient (VAIC) is the summation of Capital Employed Efficiency (CEE), Human Capital Efficiency (HCE), and Structural Capital Efficiency (SCE).	Ousama (2020).

Variable	Proxies	Measurement	Source(s)
NC	Natural Capital	Dummy (1 or 0) of Environmental Disclosures of Energy, Water, Biodiversity, Emission, Effluent and Waste, Products and Services, environmental impact disclosure, and compliance to environmental laws and regulations. A firm is assigned 1 if any of the above is disclosed in annual report of a company, otherwise, 0.	Zamil and Hassan (2019).
RG	Revenue Growth	Current Year Revenue (CYR) minus Prior Year Revenue (PYR) divided by Prior Year Revenue (CYR-PYR/PYR)	Kasogo (2020).

Source: Author's Compilation

The apriori expectation for the study is that the independent variables; intellectual capital, and natural capital are expected to have a positive and significant effect on the dependent variable, return on equity (financial performance).

RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistics gives the idea of the overall distribution in a dataset (Jennifer & Brooks,2021; Kothari & Garg, 2019). Here, mean, standard deviation, maximum, minimums, and Shapiro-Wilk probability are used in describing the data for the study. Table 2 presents the descriptive statistics for the variables of the study below.

Table 2 Descriptive Statistics (STATA Version 16 output)

Stats	roe	ic	nc	rg
N	190	190	190	190
mean	13.62	4.98	0.14	0.08
sd	25.72	3.48	0.23	0.27
max	187.28	21.68	1.00	1.42
min	-71.42	-7.34	0.00	-.84
Prob(SW)	0.00	0.00	0.00	0.00

Table 2 shows the total observations of one hundred and ninety (190) consisting of 19 sampled listed multinational companies in Nigeria for the period of 10 years (2012 to 2021). The probability value for return on equity, intellectual capital, natural capital, and revenue growth is 0.00 which is less than a 5% significant level. The descriptive statistics reveals that the mean return on equity (ROE)of the sampled listed multinational companies in Nigeria was 13.62 with a standard deviation (SD) of 25.72. The maximum value of return on equity was 187.28 while the minimum value was -71.42. This means that the maximum return on equity attributed to shareholders stands at 187.28 and a negative return on equity for companies that incurred losses during the period. Nestle Nigeria Plc recorded the highest return on equity of 187% in the year 2021. It is worth noting that Nestle Nigeria Plc operates in the consumer goods sector of the Nigerian economy. This performance is obvious that despite the global negative impact of COVID-19 on businesses, demand for consumable goods was sustained.

The descriptive statistics reveals that the mean intellectual capital (IC)of the sampled listed multinational companies in Nigeria was 4.98 with standard deviation (SD)of 3.48. The maximum value of intellectual capital (IC) was 21.68 while the minimum value was -7.34. This means that the maximum intellectual capital contribution through Capital Employed Efficiency (CEE), Human Capital Efficiency (HCE), and Structural Capital Efficiency (SCE) is 187.28 during the period under review.

Further, descriptive statistics reveal that the mean natural capital (NC)of the sampled listed multinational companies in Nigeria was 0.14withastandarddeviation (SD)of0.23. The maximum value of natural capital (NC) was 1.00 while the minimum value was 0.00. This means that the maximum natural capital is 1.00 and a minimum value of 0.00 because natural capital is measured by the environmental disclosure index adopted by the Global Reporting Initiative 2016. The moment the company discloses the parameters such as Energy, Water, Biodiversity, Emission, Effluent and Waste, Products and Services, environmental impact disclosure, and compliance with environmental laws and regulations. 1 if any of the above is mentioned in an annual report of a company and 0 otherwise during the period under review.

The descriptive statistics in Table 2 further reveal that the mean revenue growth (RG), the control variable used for the sampled listed multinational companies in Nigeria was 0.08 with standard deviation (SD) of 0. 27. The maximum value of revenue growth (RG) was 1.42 while the minimum value was -0.84. This means that the maximum growth in revenue during the period under review, occurred in the 2021 financial year, Scoa Nigeria Plc recorded revenue growth of 1.42 in 2021, meaning that the company exceeded the 2020 total revenue position by 142%. On the other hand, the least revenue growth during the period was -0.84. In the 2021 financial period, Transcorp Nigeria Plc recorded negative growth in revenue by -0.84.

Correlation Analysis

Correlation measures the degree of relationship between two variables in a linear manner. The range of coefficient of correlation falls within perfectly positive (+1) and perfectively negative (-1) values. When the coefficient of correlation is zero (0) it implies that there is no correlation (Adefila, 2008). Positive correlation connotes that a change in one variable causes a directly proportional change in the other variable. A negative correlation means that an increase in one variable will cause a decrease in the other variable by the degree of association between the two variables. According to Gujurati and Porter (2009), a coefficient of correlation 0.8 and above indicates a strong relationship between two variables. Hair et al. (2010) argues that a positive or negative correlation of 0.9 is safe.

Table 3 below reveals the degree of correlation and association among dependent, independent, and control variables of the study.

Table 3 Correlation Matrix (STATA Version 16 output)

	roe	ic	nc	rg
roe	1.0000			
ic	0.0939	1.0000		
nc	0.1050	-0.2507	1.0000	
rg	0.1627	0.1835	0.0348	1.0000

The above results in Table 3 show that there exists a positive association between return on equity (ROE) and intellectual capital (IC) (ROE/IC=0.09). This positive association supports the idea that one percent (1%) improvement in intellectual capital directly impacts financial performance proxied with return on equity (ROE) by nine percent (9%). The interaction between return on equity (ROE) and natural capital reveals the coefficient of correlation (ROE/HC=0.11) meaning that a unit change in natural capital directly affects financial performance represented by return on equity (ROE) to a degree of eleven percent (11%). Also, the extent of the relationship existing between return on equity (ROE) and revenue growth (RG), the control variable of the study (ROE/RG=0.16) implies that a unit change in revenue growth (RG) causes a proportional change of 16% in financial performance. The positive relationship exists between return on equity (ROE) and the independent variables (intellectual capital and natural capital) and revenue growth (RG). It can also be observed that our control variables exhibit a positive relationship with financial performance. From Table 3 correlation matrix above, all the coefficients of correlation are below 0.8, which indicates that the degree of association between variables is not highly correlated based on the decision criterion of a 0.8 correlation

coefficient (Gujurati and Porter, 2009). To test an absence of multicollinearity or otherwise, among the variables the Variance Inflation Factor (VIF) test is conducted.

Multi Collinearity Test

Multicollinearity arises in multiple regression models when two explanatory (independent) variables are “collinear’’ that is when they stand in an exact or almost exact linear relationship to each other (or to one another). Variance Inflation Factor (VIF) is used to detect multicollinearity in regression analysis. VIF measures how much the variance of an independent variable is influenced or inflated by its interaction or correlation with other independent variables (Folio et al., 2020; Gujarati& Porter, 2009).

Decision Rule

The decision rule is that the variance Inflation Factor (VIF) above 10 is an indication of multicollinearity existence in the data, on the other hand, a VIF of less than 10 shows the absence of a multicollinearity problem (Gujarati & Porter, 2009). The variance Inflation Factor (VIF) result is presented in Table 4.

Table 4 Results of Multi collinearity/VIF Test (STATA Version 16 output)

Variable	VIF	1/VIF
ic	1.11	0.900138
nc	1.07	0.930369
rg	1.04	0.959358
Mean VIF	1.08	

To confirm or otherwise the results of the low degree of correlation between independent variables of the study established in correlation analysis above (Table 3 referenced). A multicollinearity test was carried out on all independent variables of the study as shown in Table 4 above. The results show that intellectual capital (IC) has a VIF of 1.11, at a 0.900138 acceptance level, indicating that there is no issue of high collinearity with other variables; natural capital (NC) has a VIF of 1.07 at a 0.930369 acceptance level, which indicates that the data for natural capital (MC) has lower collinearity with other independent variables in the model. Furthermore, the results revealed that revenue growth (RG) has a Variance Inflation Factor (VIF) of 1.04 at a 0.959358 acceptance level, which is an indication that the data for revenue growth (RG) has lower collinearity with other explanatory variables of the study. The mean VIF for all explanatory variables is 1.08 indicating that the problem of multicollinearity among the

independent variables of the study does not exist in the dataset. The decision rule is that the mean VIF above 10 is an indication of multicollinearity existence in the data, on the other hand, the mean VIF of less than 10 shows the absence of a multicollinearity problem. Here, the mean Variance Inflation Factor (VIF) value of 1.08 which is less than the benchmark value of 10 indicates the absence of multicollinearity among the explanatory variables of the study.

Spam Test

The decision rule for selecting pooled OLS regression model or fixed-effects model is conducting a spam test.

Decision Rule

If the p-value is more than 0.05, that is at a 5% significant level, do not reject Ho and conclude that Pooled OLS model is appropriate. If the p-value is less than 0.05, reject Ho and conclude that the Fixed Effect model is appropriate.

The Null Hypothesis is represented by (Ho), and the Alternate Hypothesis is represented by (H_1).

H_o: *Pooled OLS regression model rather than a Fixed Effect model is appropriate*

H_1: *Pooled OLS regression is not appropriate.*

Table 5 below presented the spam test result to ascertain the appropriate model between pooled OLS and fixed effects model.

Table 5 Spam Test (STATA Version 16 output)

	$Chibar^2$	Prob.> chi^2
Spam test	13.58	0.0000

The results presented in the Table 5 above show that the spam test probability of Chi-square value of 13.58 with a corresponding probability of P >Chi^2- value of 0.0000. The probability value of 0.0000 is less than t the critical value of 0.05. The null hypothesis restated that; Pooled OLS regression model rather than a Fixed Effect model is appropriate. Therefore, based on the decision rule, the null hypothesis stands rejected, and the study accepts the alternate hypothesis, and the study concludes that the fixed effects model is the most appropriate.

Breusch and Pagan Lagrangian multiplier (LM) test

LM test is a test that determines the most appropriate model between the random effect model and pooled ordinary least square model.

Decision Rule

If the probability of LM is less than the critical value or significance level, in this case, 0.05, the Random Effect model is most appropriate and if the probability of LM is greater than the critical value or probability, in this case, 0.05 then, Pooled OLS model is the appropriate model (Zulfikar, 2018).

Table 6 below presents a test for random effects to investigate the appropriate model between Pooled OLS and Random effect models using the LM test.

Table 6 Breusch and Pagan Lagrangian multiplier test for random effects (STATA Version 16 output)

```
roe[pid,t] = Xb + u[pid] + e[pid,t]

Estimated results:
                  |       Var     sd = sqrt (Var)
         ---------+------------------------------
              roe |   661.5298       25.72022
                e |   290.7296        17.0508
                u |   431.8662       20.78139
Test:   Var(u) = 0
                     chibar2(01) =   248.87
                   Prob > chibar2 =   0.0000
```

The Breusch and Pagan Lagrangian multiplier (LM) test determines whether the model contains any random effects. Individual- or time-specific error components being zero is the null hypothesis. The LM test contrasts the pooled OLS model and the random-effects model. The ruling read as follows: The decision rule states that if the P value is larger than 0.05%, there may be no justification to reject the null hypothesis, and if it is less than 5%, accept the alternative hypothesis (0.05). The probability of the LM test is less than the significant level of 0.05, as shown by the Chibar^2 value of 275.02 and the probability > Chibar^2 of 0.000 (Table 6 above, refers); therefore, we conclude that the Random Effects model is the most appropriate.

Hausman Test

The Hausman test is a statistical test to select between the fixed effects model and random effects model, which model is appropriate to interpret and recommend policy implication of the study.

Decision Rule

If the p-value is larger than 0.05, do not reject Ho and conclude that the Random Effects model is appropriate.

If the p-value is less than 0.05, reject Ho, and conclude that Fixed Effects is appropriate (Zulfikar, 2018).

H_o: *Random Effects model rather than Fixed Effect model is appropriate.*

H_1: *Random Effects model is not appropriate.*

Table 7 Hausman Test (STATA Version 16 output)

```
                 ---- Coefficients ----
   |      (b)           (B)             (b-B)     sqrt(diag(V_b-V_B))
   |       fe            re         Difference          S.E.
-------------+----------------------------------------------------------------
-------
ic |    1.115892     1.074966        .0409259        .1385322
nc |    6.077239     7.003604       -.9263657        2.172889
rg |    12.58433     12.72004       -.1357126        .7611142
------------------------------------------------------------------------------
-------
        b = consistent under Ho and Ha; obtained from xtreg
  B = inconsistent under Ha, efficient under Ho; obtained from xtreg
    Test:  Ho:  difference in coefficients not systematic
                  chi2(3) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
                          =         0.42
                Prob>chi2 =      0.9360
```

Spam test results indicated that the fixed effect model is appropriate (Table 5 referred), and Breusch and Pagan Lagrangian multiplier (LM) results indicated that the random effect model is appropriate (Table 6 referred). The outcome of the Spam test and LM test necessitated the need to conduct the Hausman test to choose between the fixed effects model and random effects mode, the suitable model for interpretation. The two commonly used panel data regression estimate techniques (fixed effect and random effect) were employed to examine the cause-and-effect connection between the dependent (return on equity) and independent variables (intellectual capital and natural capital). The estimation of the random effect panel regression assumes that the error term and explanatory variables are associated, and the estimation of the fixed effect panel regression assumed that there is no association between the error term and explanatory variables.

The Hausman test was used to choose between the two-panel regression estimation findings, and the test is based on the null hypothesis that the random effect model is preferable to the fixed effect model. The Hausman test's p-value of 0.94 (Table 7 referenced) suggests that

there is no reason to reject the null hypothesis at a 5% level of significance, because the probability value of Chi-square of 94% fall outside, the critical value of 5% significance. Therefore, the study rejects the alternate hypothesis, which that states the fixed effects model is preferred. This suggests that for drawing our conclusions and making recommendations, the study should use the random effects panel regression results.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Test

The Breusch-Pagan test is used to determine whether heteroskedasticity is present in a regression model. The assumption that the residuals are distributed with equal variance at each level of the predictor variable is one of the fundamental tenets of linear regression. Homoscedasticity is the name for this presumption. We claim that heteroscedasticity is evident in the residuals when this presumption is violated. When this happens, the regression's findings are no longer reliable (Gujurati & Porter, 2009).

Decision Rule

If the p-value of the Breusch-Pagan / Cook-Weisberg test for the heteroskedasticity Test is less than the significance level of 0.05, is an indication that heteroskedasticity is present in a regression model. If the p-value of the Breusch-Pagan / Cook-Weisberg test for the heteroskedasticity Test is greater than the significance level of 0.05, is an indication that heteroskedasticity is absent in a regression model (Gujurati & Porter, 2009). The hypothesis is stated thus,

Ho: *Homoskedasticity is present (the residuals are distributed with equal variance).*

H_1: *Heteroscedasticity is present (the residuals are not distributed with equal variance).*

The decision rule for heteroscedasticity is stated thus, rejecting the null hypothesis, and concluding that heteroscedasticity is present if the p-value associated with this Chi-Square test statistic with p (the number of predictors) degrees of freedom is less than the 5% significance level (that is, = 0. 05). The null hypothesis should not be rejected, and heteroscedasticity is not present if the likelihood of Chi-Square is greater than the 5% level of significance.

Table 8 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Test Results

(STATA Version 16 output)

Ho: Constant variance; Variables: fitted values of roe

	Chi^2	Prob > chi2
Hettest	0.68	0.4105

The absence of homoskedasticity, the Ordinary Least Square estimator's constant variance assumption, is referred to as heteroskedasticity. The breakdown of the BLUE (Best Linear Unbiased Estimator) features, which results in the loss of the efficiency and consistency property, is implied by the absence of non-constant variance.

The outcome of the test for heteroscedasticity is shown in Table 8 above. The probability of Chi-Square is 0.41, which is greater than the significant level of 5%, automatically, no justification to reject the null hypothesis implying that the data are homogenous. The conclusion is that there is no issue of heteroscedasticity. The test for heteroscedasticity yielded a probability value of 0.41, which suggests that there is no uneven variance in the model. The implication is that our probability values for inferring the degree of importance are valid and dependable. There is no need for robust or weighted least square regression because the absence of heteroscedasticity validates the OLS results.

Results of Random Effects Model

According to the random effects assumption, the unobserved individual heterogeneity has no relationship to the independent variables. The error terms of each company are used in the random effect model to account for the variance in intercepts (Zulfikar, 2018). Table 9 below presents the result of the random effects model for interpretation.

Table 9 Random Effects Model (STATA Version 16 output)

```
Random-effects GLS regression                   Number of obs     =        190
Group variable: pid                             Number of groups  =         19
R-sq:                                           Obs per group:
within  = 0.0805                                              min =         10
between = 0.0087                                              avg =       10.0
overall = 0.0381                                              max =         10
                                                Wald chi2(3)      =      15.01
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0018
------------------------------------------------------------------------------
         roe |      Coef.   Std.Err.      z    P>|z|     [95% Conf.interval]
-------------+----------------------------------------------------------------
          ic |   1.074966   .5062112     2.12   0.034    .0828107    2.067122
          nc |   7.003604   7.700065     0.91   0.363   -8.088246    22.09545
          rg |   12.72004   5.00317     2.54   0.011    2.914007    22.52607
       _cons |   6.203639   5.71628     1.09   0.278   -5.000078    17.40736
-------------+----------------------------------------------------------------
     sigma_u |  20.78139
     sigma_e |  17.050795
         rho |  .59765941   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

The model is appropriate to explain the association presented in the study, as evidenced by the Wald chi-square value of 15.01 and a matching Prob.>F of 0.0018 which is below the 5% significant level.

Test of Hypotheses

Hypothesis 1: *Intellectual capital has no significant effect on financial performance of listed multinational companies in Nigeria.*

The intellectual capital as an independent variable to financial performance proxied with return on equity (ROE/IC) presented in Table 9 regression results show that the intellectual capital of the listed multinational companies in Nigeria, during the study period has a positive and significant effect on financial performance at the 5% level (ceff1.075, p=0.034). Therefore, because of the probability of p>z of 0.034, the study rejects the null hypothesis and concludes that intellectual capital has a significant effect on the financial performance of listed multinational companies in Nigeria. It implies recruitment of highly competent staff directly improves the financial performance of listed multinational companies in Nigeria by 2.9% in terms of return on equity. This finding is consistent with the study outcome of (Yahir et a., 2021; Chechet et al., 2020; Yilmaz & Acar, 2018) that intellectual capital positively and significantly influenced financial performance.

Hypothesis 2: *Natural capital has no significant effect on financial performance of listed multinational companies in Nigeria*

The natural capital as an independent variable to financial performance proxied with return on equity (ROE/NC) presented in Table 9 regression results show that the natural capital of the listed multinational companies in Nigeria, during the study period has a positive but insignificant effect on financial performance at the 5% level (ceff. 7.004, p=0.363). Therefore, because of the probability of p>z of 0.363, the study has no reason to reject the null hypothesis and concludes that natural capital has no significant effect on the financial performance of listed multinational companies in Nigeria. It implies that a unit variation in the natural capital will cause a directly proportional effect of 7% in the financial performance of listed multinational companies in Nigeria. This finding varies with the findings of (Mujal & Malarvizhi, 2021; Sudha, 2020; Kosovic & Patel, 2013). Who found that natural capital significantly affected the financial performance of companies

DISCUSSION OF FINDINGS

The study evaluated the effect of intellectual and natural capital on financial performance: Evidence from listed multinational companies in Nigeria. The outcome of the study revealed that intellectual capital has a positive and significant impact on the financial performance of listed multinational companies in Nigeria. The findings are consistent with the findings of (Aluwong, 2022; Esy & Heri, 2022; Tahir et a., 2021; Chechet et al., 2020; Yilmaz & Acar, 2018) documented that intellectual capital significantly affects financial performance. This consistency arises because they also used the same methodology. They proxied the intellectual capital using Value Added Intellectual Coefficient (VAIC) which is made of three components Capital Employed Efficiency (CEE), Human Capital Efficiency (HCE), and Structural Capital Efficiency (SCE). Despite the decomposition of the Value-Added Intellectual Coefficient (VAIC) by Yilmaz & Acar (2018) and employed multiple methods to measure financial performance. They argue that their findings of multi-component models are more effective in explaining the market and financial performance than the single-factor model. The policy implication of the findings is that companies should engage in the hiring of competent employees as it contributes significantly to enhancing the financial performance of companies. The outcome of the study is that intellectual capital has a positive and significant effect on the financial performance of listed multinational companies in Nigeria. This finding is inconsistent with the findings of Oyedokum and Saidu (2018). Their investigation on the impact of intellectual capital on the financial performance of listed Nigerian oil and marketing companies. The domain for the study the oil and gas sector could have contributed to the study result being different from the study at hand. The use of Tobin's Q in addition to the return on assets (ROA) may have contributed to the disparity and inconsistency in the outcome of the study.

The study's second findings revealed that natural capital has a positive but insignificant effect on the financial performance of listed multinational companies in Nigeria. This finding is consistent with the outcomes of Kalash (2022) who studied the effect of environmental capital on financial companies in Turkey. It was discovered that the environmental information disclosed in Turkey has a weak impact on the financial performance of companies. The consistency of this finding with the study at hand could be attributed to the similarity of the measurement of the environmental capital disclosure used. However, our findings are inconsistent with the outcome of studies by (Mujal & Malarvizhi, 2021; Sudha, 2020; and Kosovic & Patel, 2013). Their results showed natural/environmental capital significantly affects financial performance. These inconsistencies may have resulted from sectoral and country-specific factors since these are known to affect disclosures (Matemane & Wentzel, 2019).

CONCLUSION AND RECOMMENDATIONS

Integrated reporting captures the six capital, financial capital, manufactured capital, intellectual capital, human capital, social and relational capital, and natural capital as its components. It incorporates information that is clearly and coherently conveyed to users of the information, both financial and non-financial.

This study, therefore, examined the effect of intellectual and environmental capital on the financial performance of listed multinational companies in Nigeria. The study period spanned ten (10) years from 2012 to 2021; data used for the study were sourced from the published financial statements of the companies and the Nigeria Exchange Group (NGX). The study was underpinned by resource-based theory. Extensive literature was reviewed on intellectual capital and natural capital on the financial performance of companies in Nigeria and beyond to establish the gaps and motivation for the study. The study outcome revealed that intellectual and natural capital improves financial performance.

The study concludes that intellectual capital has a significant effect on the financial performance of listed multinational companies in Nigeria. Companies that disclose information on natural capital are not likely to have an improvement in their financial performance.

The study recommends that multinational companies should invest more in intellectual capital by using highly rated human resource consultants in recruiting staff, as it significantly improves financial performance. The management of the companies is advised to continue and sustain the best practices of integrated reporting because, it creates value for the business owners and other stakeholders in the short, medium, and long term.

The study used conglomerates which are large companies and the inclusion of smaller listed companies in a study may affect the generalization of the study. The variables used in this study were limited to intellectual capital and natural capital. However, the use of other variables such as financial capital, manufactured capital, social capital, and human capital could affect the disclosures and performance of companies. Furthermore, the data used was sourced from the financial statement of companies the same result could have come from the Nigeria Exchange Group (NGX) but in condensed form. Our study examined the effect of intellectual and natural capital on the financial performance of listed multinational companies in Nigeria. The study focused on large conglomerates/multinationals further studies can explore all listed companies that will provide more understanding of the relationships. A similar study can examine other variables like financial capital, manufactured capital, social capital, and human capital.

REFERENCES

Abanyam, N.L., Akinlola, F.A. & Dankano, E. (2020). Multinational corporations and socio-economic development in developing countries. *Interdisciplinary Journal of African and Asian Studies*, *6*(2), 1-16.

Abeywardana, S.M., Azam, F., & Low, K.L.T. (2021). Theoretical review on integrated reporting. *International Journal of Scientific and Technology Research*. *10* (5).

Adam, C. (2016). Return on equity: A compelling case for investors. *Jensen Investment Management*, 1-15.

Adegboyegun, A. E., Alade, M. E., Ben-Caleb, E., Ademola, A. O., Eluyela, D. F., & Oladipo, O. A. (2020). Integrated reporting and corporate performance in Nigeria: Evidence from the banking industry. *Cogent Business & Management, 7*(1). http://dx.doi.org/10.1080/23311975.2020.1736866

Adefila, J.J. (2008). *Research methodology in behavioural sciences*. Apani Publications.106 -109.

Ahmed, M., Waseer, W. A., Hussain, S. & Ammara, U. (2018). Relationship between environmental accounting and non-financial firms' performance: An empirical analysis of selected firms listed in Pakistan Stock Exchange, Pakistan. *Advances in Social Sciences Research Journal*, *7*(3), 197-209.

Akintoye, I. R., Adegbie, F. F. & Bello, I. D. (2022). Intellectual capital and organisational performance of the financial sector: Evidence from Nigeria. *International Journal of Accounting, Finance and Risk Management*. *7*(1), 1-10. https//doi.org/10.11648/j.ijafrm.20220701.11

Ali, S., Murtaza, G., Hedvicakova, M. Jiang, J. & Naeem, M. (2022). Intellectual capital and financial performance: A comparative study. *Frontiers of Psychology*. 01-12.

Aluwong D.B. (2022). Intellectual capital performance of non-finance firms In Nigeria. *European Journal of Business and Innovation Research*, *10(*1), 1-17.

Ame, J. O. (2021). Advanced Auditing Theory ACC 924 Lecture Note. Bingham University, Karu, Nasarawa State, Nigeria.

Bar-Gill, O., & Ben-Shahar, O. (2021). Rethinking Nudge: An Information-Costs Theory of Default Rules. *The University of Chicago Law Review, 88*(3), 531-604. https://www.proquest.com/scholarly-journals/rethinking-nudge-information-costs-theory-default/docview/2533826375/se-2

Baye, F.M., Douanla, J. & Fonkem, N.M. (2014). Impact of intellectual capital efficiency on the financial performance of financial institutions in Yaoundé, Cameroun. *International Journal of Arts and Commerce*, *3*(4). https://www.ijac.org.uk/images/frontImages/gallery/Vol._3_No._4/14.pdf.

Berzkalne, I. & Zelgalve, E. (2014). Intellectual capital and company value**.** *Procedia – Social and Behavioral Sciences*, *110* (2014), 887-896.

Birley, S., & Westhead, P. (2013). Growth and performance contrasts between 'types' of small firms. *Strategic Management Journal*, *11*(7), 535-557.

Brammer, S. & Pavelin, S. (2006). Voluntary environmental disclosures by large UK companies, *Journal of Business Finance & Accounting*, *33*(7-8), 1168-1188.

Brillouin, L. (2013). *Science and information theory*. Courier Corporation.

Casson, M. (1999). The Organisation and Evolution of the Multinational Enterprise: An Information Cost Approach. *MIR: Management International Review*, *39*(1), 77–121. http://www.jstor.org/stable/40835812

CFI (2022). Diffusion of innovation. The rate at which new ideas and technology spread *https://corporatefinanceinstitute.com/resources/knowledge/other/diffusion-of-innovation/*

Charles, S. & Muyiwa E. A. (2022). Environmental accounting and financial performance of listed family-owned companies in Nigeria. *International Review of Business and Economics*. 6 (1),

Chechet, I.L., Ayuba, I.A., Ahmad, A., Ishola, A.K., & Olaranrewaju, I.S. (2020). Intellectual capital and financial performance of listed Deposit Money Banks in Nigeria. *ResearchGate*, 1-18.https://www.researchgate.net/publication/344632529_Intellectual_Capital_and_Financial_Performance_of_Listed_Deposit_Money_Banks_in_Nigeria

Chen, M.C., Cheng, S.J. & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital*, *6* (2), 159-176.

Cooperation and Development, OECD Group of Financial Statisticians, Development. Committee on International Investment, and Multinational Enterprises (1996). OECD Benchmark Definition of Foreign Direct Investment. Paris, France, OECD.

Cuozzo, B., Dumay, J., Palmaccio, M., & Lombardi, R. (2017). Intellectual capital disclosure: A structured literature review. *J. Intellect. Cap*. *18*, 9-28. https//doi.org/10.1108/ JIC-10-2016-0104

Dagiliene, L., & Nedzinskiene, R. (2018). An institutional theory perspective on non-financial reporting: The developing Baltic context. *Journal of Financial Reporting and Accounting*, 00–00. https://doi.org/10.1108/JFRA-06-2016-0054

Dearing, J.W. & Cox, J.G. (2018). Diffusion of innovation theory, principles, and practice. *Health Affairs*, *37*(2), 183-190. https://doi.org/10.1377/hlthaff.2017.1104

Déjean, F. & Martinez, I. (2009). Environmental disclosure and the cost of equity: The French Case, *Accounting in Europe*, *6*(1), 57-80.

Denti, T., Marinacci, M., & Rustichini, A. (2022). Experimental cost of information. *American Economic Review*, *112*(9), 3106-23.

Emeakponuso, D. E., & Udih, M. (2015). Environmental accounting practices by corporate firms in Nigeria. *Advances in Research*, *3*(2), 209 -220.

Etim, O. E., Idorenyin H. E. &Nsima J. U. (2022). Effects of environmental/natural capital reporting on profitability of manufacturing firms in Nigeria. *International Journal of Social Science Humanity & Management Research.1*(1), 25-34.

Esy, N. A. &Heri, P. (2022). Intellectual capital and financial performance in Sharia Commercial Banks in Indonesia. *International Journal of Social Science Research and Review.5*(4),12-19.http://ijssrr.com editor@ijssrr.com

Farneti, F., Casonato, F., Montecalvo, M., & de Villiers, C. (2019). The influence of integrated reporting and stakeholder information needs on the disclosure of social information in a state-owned enterprise. Meditari Accountancy Research, *27*(4), 556–579. https://doi.org/doi.org/10.1108/MEDAR-01-2019-0436

Farrukh, I. &Faizan, N. (2016). Financial performance of firms; evidence from Pakistan cement industry. *Journal of Teaching and Education,5*(1), 81-94.

Folli, G. S., Nascimento, M., de Paulo, E., H., Cunha, P. H. d., Romão, W., &Filgueiras, P. R. (2020). Variable selection in support vector regression using angular search algorithm and variance inflation factor. *Journal of Chemometrics*, *34*(12). https://doi.org/10.1002/cem.3282

GRI (2016). Global Reporting Initiative: Consolidated set of GRI standard. https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-english-language/

Gujarati, D.N. and Porter, D.C. (2009). *Basic Econometrics*. 5th Edition, McGraw Hill Inc., New York.

Gupta, K., Goel, S. & Bhatia, P. (2020). Intellectual capital and profitability: Evidence from Indian pharmaceutical sector. *Vision 24*, 204–216. https//doi.org/10.1177/0972262920914108

Hair, J.F., Black, W.C., Babin, B.J. & Anderson, R.E. (2010). *Multivariate Data Analysis*. 7th Edition, Pearson, New York

Hsieh, C.-T., Huang, H.-C. &Lee, W.-L. (2016). Using transaction cost economics to explain open innovation in start-ups, *Management Decision*, *54*(9), 2133-2156. https://doi.org/10.1108/MD-01-2016-0012

The Institute of Chartered Accountants of Nigeria (2019). Study Pact on Performance Management.

IIRC (2021). International integrated reporting framework January 2021. https://integratedreporting.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf

Jennifer, D. A., & Brooks, S. (2021). Descriptive statistics are powerful tools for organizational research practitioners. Industrial and Organizational Psychology, 14(4), 481-485. https://doi.org/10.1017/iop.2021.116

Jhunjhunwala, S. (2014). Beyond financial reporting- international integrated reporting framework. *Indian Journal of Corporate Governance*, *7*(1), 73-80.

Joshi, M., Cahill, D., Sidhu, J. & Kansal, M. (2013). Intellectual capital and financial performance: An evaluation of the Australian financial sector*, Journal of Intellectual Capital*, *14*(2), 264-285.

Kalash, I. (2020). Environmental disclosure: Determinants and effects on financial performance? An empirical evidence from Turkey. *Sosyoekonomi*, *28*(46), 95-115

Kasoga, P. S. (2020). Does investing in intellectual capital improve financial performance? Panel evidence from firms listed in Tanzania DSE. *Cogent Economics & Finance*, *8*(1). http://dx.doi.org/10.1080/23322039.2020.1802815

Kilic, M. &Kuzy, C. (2017). Factors influencing sustainability reporting: Evidence from Turkey. *ResearchGate*, 139-175. https://www.researchgate.net/publication/321772618

Kothari, C. R. & Garg, G. (2019). *Research Methodology: Methods and techniques* (4th ed.). New Age International Publishers. 1- 449.

Kosovic, K., & Patel, P. (2013). Integrated Reporting - Is it value relevant? A quantitative study on Johannesburg Stock Exchange. Master (Thesis) Jonkoping University.

Lhaopadchan, S. (2010). Fair value accounting and intangible assets: Goodwill impairment and managerial choice. *Journal of Financial Regulation and Compliance*, *18* (2), 120-130.

Lu, Y. & Abeysekera, I. (2014) "Stakeholders' power, corporate characteristics, and social and environmental disclosure: Evidence from China, *Journal of Cleaner Production*, *64*, 426-436.

Maditinos, D. Chatzoudes,D., Tsairidis, C. &Theriou, G. (2011). The impact of intellectual capital on firms' market value and financial performance. *Journal of Intellectual Capital*, *12* (1) (2011), 132-151.

Magara, R., Aming, N.N., & Momanyi, E. (2015). Effect of environmental accounting on company financial performance. *British Journal of Economics, Management and Trade*, *10*(1), 1-11.

Mavridis, D.G.& Kyrmizoglou, P. (2005). Intellectual capital performance drivers in the Greek banking sector, *Management Research News*, 28 (5), 43-62.

Matemane, R., & Wentzel, R. (2019). Integrated reporting and financial performance of South African listed banks. *Bank and Banks System*, *14*(2), 128–139. http://dx.doi.org/10.21511/bbs.14(2).2019.11

Mondal, A. & Ghosh, S.K. (2012). Intellectual capital and financial performance of Indian banks. *Journal of Intellectual Capital*, *13* (4) (2012), 515-530.

Monteiro, A. (2006). A Quick Guide to Financial Ratios. *The Citizen: Moneyweb Business Insert*, 6 May: 3.

Morris, M. H., Kuratko, D. F., Allen, J. W., Ireland, R. D., & Schindehutte, M. (2010). Resource acceleration: Extending resource-based theory in entrepreneurial ventures. *Journal of Applied Management and Entrepreneurship*, *15*(2), 4-25. https://www.proquest.com/scholarly-journals/resource-acceleration-extending-based-theory/docview/497134744/se-2?accountid=194676

Munjal, P., & Malarvizhi, P. (2021). Impact of Environmental Performance on Financial Performance: Empirical Evidence from Indian Banking Sector. *Journal of Technology Management for Growing Economies*, *12*(1), 13–24. https://doi.org/10.15415/jtmge.2021.121002

Nailal, H. & Rika, A. (2016). The analysis of financial performance on net profit margin at the coal company. *Journal of Management and Applied Sciences*, *2*(4), 105 -108. http://www.iraj.in/journal/journal_file/journal_pdf/14-245-1463031463105-108.pdf

Ndifon, O. E., Orok, E. O., & Sackey, J. A. (2014). The development of environmental accounting and disclosure practices of manufacturing companies in Nigeria. *Journal and Sustainable Development*, *5*(12), 70-73.

Nizar, M. A. (2016). The diffusion of accounting innovations in the new public sector as influenced by IMF reforms: actor-network theory*. International Journal of Actor-Network Theory and Technological Innovation (IJANTTI)*. *8*(4), 26-51.

Nwaimo, S.C. (2020). Effect of environmental cost on performances of quoted firms in Sub – Saharan Africa. *European Journal of Accounting, Auditing and Finance Research*, *8*(7), 97 - 120.

Ofoegbu, G. N., Odoemelam, N., & Okafor, R. G. (2018). Corporate board characteristics and environmental disclosure quantity: Evidence from South Africa (integrated reporting) and Nigeria (traditional reporting). *Cogent Business & Management*, *5*(1), 1-27.

Okeagbe, T.O., &Ofurum, D.I. (2019). Effect of environmental management accounting and financial performance of Nigerian consumer goods. *International Journal of Advanced Academic Research*, *5*(1), 1-15.

Ousama, A. A., Hammami, H., & Abdulkarim, M. (2020). The association between intellectual capital and financial performance in the Islamic banking industry: An analysis of the GCC banks. *International Journal of Islamic and Middle Eastern Finance and Management*, *13*(1), 75-93. http://dx.doi.org/10.1108/IMEFM-05-2016-0073

Ovidiu, N &Ciprian, N. (2022). Stakeholders management and social responsibility: Concepts, approaches, and tools in COVID context, Routledge, 1-397.

Oyedokum, G.O. & Saidu, B. (2018). Impact of intellectual capital on financial performance of listed Nigerian oil marketing companies. Information and Knowledge Management, 8(9), 13-27.

Powell, S. (2003). Accounting for intangible assets: current requirements, key players and future directions. *European Accounting Review*, *12* (4) (2003), 797-811.

Rogers, E.M. (1995). *Diffusion of Innovations* (4th ed.). the Free Press, New York.

Rosam, I. and Peddle, R. (2004). *Implementing effective corporate social responsibility and corporate governance: A guide*, British Standards Institutions.

Saeed, F., Shekoofeh, F. & Mahnaz, K. (2013). Impact of intellectual capital on financial performance. *International Journal of Academic Research in Economics and Management Sciences*, *2*(1), 6.

Schulze, W. S. (1992). The two resource-based models of the firm: Definitions and implications for research. *Academy of Management Best Paper Proceedings*,

Sengottuvel, C. (2018). Environmental accounting and firms' profitability. *International Journal of Innovative Research in Management Studies*, *3*(1), 22-27.

Shahid, J., Neelam, T., Israr, K. Y. & Muhammad, H. (2014). The impact of training and development on employees performance and productivity: A case study of United Bank Limited Peshawar City, KPK, Pakistan, *International Journal of Academic Research in Business and Social Sciences*, *4*(4), 86-98.

Shahwan, T. M. & Habib, A. M. (2020). Does the efficiency of corporate governance and intellectual capital affect a firm's financial distress? Evidence from Egypt. *J. Intellect. Cap.21*, 403–430.https// doi.org/ 10.1108/JIC-06-2019-0143

Ståhle, P., Ståhle, S., & Aho, S. (2011). Value added intellectual coefficient (VAIC): A critical analysis. *Journal of Intellectual Capital, 12*(4), 531-551. https://doi.org/10.1108/14691931111181715

Stowe, J. D., Robinson, T. R., Pinto, J. E. & McLeavey, D. W. (2002). *Analysis of equity investments: Valuation*. Baltimore, MD: Association for Investment Management and Research (AIMR), 1-336.

Sudha, S. (2020). Corporate environmental performance–financial performance relationship in India using eco-efficiency metrics. *Management of Environmental Quality: An International Journal*. https://doi.org/10.1108/MEQ-01-2020-0011

Tahir, M., Shah, S.Q.A., Khan, M.M. &Afridi, M.A. (2021). Intellectual capital and financial performance of banks in Pakistan. *The Dialogue*, *XIII* (1), 106-118.

Tencati, A., Russo, A. & Quaglia, V. (2008). Unintended consequences of CSR: Protectionism and collateral damage in global supply chains: The case of Vietnam. *Corporate Governance*. *8*(4), 518-531.

Theaker, A. (2004). *The Public Relations Handbook* (2nd ed.). Routledge. https://doi.org/10.4324/9780203600740

VRF (2022). The Value Reporting Foundation [Online]. Available at https://www.valuereportingfoundation.org/

Winter, S. &Szubanski, G. (2002). Replication of organizational routines: conceptualizing the exploitation of knowledge assets, in The Strategic Management of Intellectual Capital in Organizational Knowledge (eds) C. Choo and N. Bontis (New York, NY: Oxford University Press), 207–221.

Xu, J. & Li, J. (2019). The impact of intellectual capital on SMEs' performance in China: Empirical evidence from non-high tech vs. high-tech SMEs. *J. Intellect. Cap.20*, 488–509. https//doi.org/10.1108/JIC-04-2018-0074

Yalama, A. (2013). The relationship between intellectual capital and banking performance in Turkey: Evidence from panel data. *International Journal of Learning and Intellectual Capital*, *10* (1), 71-87.

Yang, C.C., Lin, C.Y.Y. (2009). Does intellectual capital mediate the relationship between HRM andorganizational performance? Perspective of a healthcare industry in Taiwan. *International Journal of Human Resource Management*, *20*(9), 1965-84.

Yilmaz, I. & Acar, G. (2018). The Effects of Intellectual Capital on Financial Performance and Market Value: Evidence from Turkey. *Eurasian Journal of Business and Economics*, *11*(21), 117-133.

Zamil, G. M. S., & Hassan, Z. (2019). Impact of environmental reporting on financial performance: Study of global fortune 500 companies. *Indonesian Journal of Sustainability Accounting and Management*, *3*(2), 109–118. https://doi.org/10.28992/ijsam.v3i2.78

Zhang, L., Yu, Q., Jin, Z., & Xu, J. (2021). Do intellectual capital elements spur firm performance? Evidence from the textile and apparel industry in China. Mathematical Problems in Engineering. http://dx.doi.org/10.1155/2021/7332885

Zhang, T. (2020). Beyond information costs: Preference formation and the architecture of property law, *Journal of Legal Analysis*, *12*, 1–78, https://doi.org/10.1093/jla/laz007

Zulfikar, R. (2018). Estimation model and selection method of panel data regression: An overview of common effect, fixed effect, and random effect model. https://www.researchgate.net/publication/326142125_Estimation_Model_And_Selection_Method_Of_Panel_Data_Regression_An_Overview_Of_Common_Effect_Fixed_Effect_And_Random_Effect_Model