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INTELLECTUAL CAPITAL AND CORPORATE FINANCIAL PERFORMANCE OF LISTED ICT FIRMS IN NIGERIA

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Abstract

The study determined the effect of intellectual capital on the corporate performance of listed information communication technology firms in Nigeria, using capital employed efficiency, structural capital efficiency and human capital efficiency as the independent variables, while return on equity was used for financial performance. The research used an Ex-Post Facto research design. The population of this study consists of the six information communication technology firms on the Nigerian Exchange Group. Data were generated from audited annual reports and accounts of the sampled information communication technology spanning from 2013 to 2024. The hypotheses were subjected to analysis using the pooled Ordinary Least Squares method. The study showed that capital employed efficiency and human capital efficiency have a positive significant effect on the return on equity of listed information communication technology firms in Nigeria. Structural capital efficiency has a negative and significant effect on the return on equity of listed information communication technology firms in Nigeria. It was recommended that the recognition of the positive correlation between capital efficiency and return on equity encourages agricultural enterprises in Nigeria to focus on optimizing asset utilization, prudently managing debt levels, and implementing strategic investment decisions to improve overall financial performance.

Keywords: Capital employed efficiency, Structural capital efficiency, Human capital efficiency and Return on equity

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Introduction

Intellectual capital includes a wide range of intangible resources, such as employee experience and skills, unique knowledge, innovative ideas, brand reputation, customer relationships, and organizational culture (Gidado et al., 2023; Rufus et al., 2022). Collectively, these intangible assets contribute to an organization's competitive advantage and market differentiation. Recognizing the importance of intellectual capital, leading companies have begun to focus on developing and leveraging these intangible resources to drive growth, innovation, and profitability (Otuya et al., 2023).

The era of unrestricted free trade increased mobility, initially limited to capital and goods, but extending to labor and science. These changes have also changed the way companies do business, moving from a labor-based business to a knowledge-based business with many characteristics of science (Sawarjuwono and Kadir, 2003). According to Mursida and Soetejo (2014), for companies to survive quickly, they need to change the structure of commerce from physical asset-based commerce (labor-based commerce) to knowledge-based commerce (knowledge-based commerce). Similar to the knowledge-based economy powered by information management, as finance changes, the health of businesses depends on the creation, modification, and capitalization of information itself. For modern companies, intellectuals constitute a crucial intangible capital for their assets (Clark et al., 2011).

The impact of intellectual capital in achieving competitiveness has garnered significant attention due to technological advancements, globalization, and the rise of knowledge-based economies (Abba, *et al* 2023). Intellectual capital has often been recognized as a crucial factor influencing the productivity and strategic competitiveness of firms. Intellectual capital refers to a collection of intellectual material, knowledge, experience, property, and information that contributes to creating value within an organization (Putri, *et al* 2023; Uagbale-Ekatah & Ofurum, 2022). It represents the wealth of knowledge that a company utilizes in its business operations to generate value. Studies have established that intellectual capital is an intangible asset that can influence a firm's earnings potential and absorptive capacity, making it increasingly regarded as a paramount resource for organizations (Ashraf, Sadiq, Ferreira & Almeida, 2023). In Nigeria, the recognition of intellectual capital's importance is evident in many annual reports and accounts, where the phrase "our greatest assets are our people" frequently appears (Major & Biragbara, 2023). This growing acknowledgment of intellectual capital is based on the belief that people hold as much value as other organizational resources. Over the years, the significance of intellectual capital has significantly increased, and it is now considered a crucial tool for achieving sustainable competitive advantage (Edet, *et al*, 2023). People are the most influential factor in value creation, as tangible assets can only add value when human beings effectively utilize them. Intellectual capital's dominance is a characteristic of emerging economies driven by global competition; and the valuation of intellectual capital within organizations should be based on its performance, further emphasizing its critical role in organizational success (Habib & Dalwai, 2023).

The assessment of intellectual capital efficiency involves determining whether the efforts made in developing intellectual capital contribute to achieving objectives or improving specific outcomes, such as reducing worker absences and turnover, enhancing work efficiency, and increasing productivity (Nguyen, 2023; Chukwuekwu, 2023). At the organizational level, efficiency evaluation provides insights into the company's ability to generate profits from its available resources and ensure future liquidity. This efficiency results from optimizing time, labor, and process costs (Salman, 2023). The effective utilization of human resources plays a crucial role in determining an organization's strength,

with intellectual capital efficiency revolving around maximizing productivity from human assets while minimizing costs (Tonye & Oruh, 2022).

According to Nadeem et al. (2017), Intellectual capital improves firms' financial performance regardless of geographical location. The organization's knowledge becomes a competitive advantage that distinguishes it from rivals. Consequently, numerous organizations are now aware of a fundamental truth: their actual worth is reflected in their physical and intellectual capital. This intellectual capital includes patents, customer relations, workers' innovations, skills, and the organization's mastery. On the other hand, the rapid change and development of the modern environment necessitate constant innovation in all aspects of economic, social, and technological life (Duho & Onumah, 2019).

The recent global financial crisis and numerous local and international financial scandals have reignited concerns and sparked debates regarding the connection between intellectual capital and the performance (Ofurum et al 2023). The value of an organization's intellectual capital and the role of financial accounting/reporting in corporate governance are additional arguments and concerns. Globalization, strategic coalitions, alliances between multinational corporations, and the transition to a knowledge-based economy have sparked this debate.

By appreciating the inherent value of knowledge, expertise, and intangible resources, companies are better equipped to optimize their corporate performance, achieve competitive advantage, and build a solid foundation for long-term growth and prosperity. As organizations continue to navigate the complexities of the modern business environment, the effective management and harnessing of intellectual capital will remain central to unlocking new opportunities and driving success in the ever-evolving corporate landscape (Misdar, 2023). Wilson and Eke (2025) investigated the relationship between intellectual capital performance and financial performance of Nigerian information and communication technology (ICT) companies. This study used a combination of explanatory and descriptive research on a seven-year dataset from 2017 to 2023. There was a dealth research on intellectual capital performance and financial performance of Nigerian information and communication technology (ICT) companies. The only study using ICT in Nigeria and this study ended in 2023 financial data, this leads to sectorial and periodic gaps. This study addresses this gap in literature; the study consequently, determines the effect of intellectual capital on the corporate performance of listed information communication technology firms in Nigeria. The specific objectives of the study sought to:

1. Determine the effect of capital employed efficiency on return on equity of listed information communication technology firms in Nigeria.
2. Ascertain the effect of structural capital efficiency on return on equity of listed information communication technology firms in Nigeria.
3. Examine the effect of human capital efficiency on return on equity of listed information communication technology firms in Nigeria.

Review of Related Literature

Intellectual Capital

According to Bhattu-Babaji and Sitana (2022), intellectual capital performance management is a complex process due to recognition and measurement challenges (Saez et al., 2007).

Previous literature has documented a measure of a company's intellectual capital based on the performance of human, structural, and relational capital, summarized by the value-added intelligence index (VAIC) (Acuña-Opazo & Gonzalez, 2021). VAIC is used by experts as a measure of the effectiveness of intellectual capital (Pulic, 2000, 2004).

Intellectual capital includes or represents the economic value of human, relational, and structural capital, all of which are intangible assets for a company (Otuya et al., 2023).

Intellectual capital is a complex organizational process that includes knowledge management, best practice inheritance, and organizational learning.

This process transforms employees' skills, knowledge, and experience into valuable assets essential to organizational performance. Specifically, intellectual capital is the intangible value derived from employee knowledge, skills, business learning and ideas, and assets that are not reported in the statement of financial position (Chukwuekwu, 2023).

Based on this perspective, Batubara et al (2021) and Ulm et al (2017) argue that VAIC does not have the ability to comprehensively measure the productivity of all resources. Therefore, it is necessary to consider innovation capital as a measure of the effectiveness of intellectual capital, and its importance is also recognized in the accounting literature. From this point of view, the modified value-added intelligence coefficient (MVAIC) aims to ameliorate this limitation. Therefore, research and development (R&D) expenditures have generally been used as an indicator of innovation capital performance in previous literature (Anifowose et al., 2018; Kuzey et al., 2022). Innovation efficiency from a scientific perspective is defined as: Where, InC = innovation capital expenditure for research and development.

Therefore, MVAIC is expressed as MVAIC = HCE + SCE + RCE + InCE. In the field of knowledge-based business, intellectual capital, if used correctly, is essential for measuring the internal capabilities of a company (Muhammad, 2010). Therefore, its measurement and management is very important. Intellectual capital has three main components. They are human capital, structural capital, and relational capital (Shahzad et al., 2022).

Human Capital Efficiency

Human capital performance combines a set of factors that extend beyond the knowledge and skills possessed by employees to their internal attributes and how these attributes contribute to the overall functioning of the organization (Major and Biragbara, 2023). Human capital performance emphasizes the idea that employees are not just cogs in a machine, but are the driving force behind a company's growth and development (Al-Delawi et al., 2023). This category of intellectual capital includes not only technical skills but also intangible qualities such as creativity, adaptability, and problem-solving abilities (Abba et al., 2023). These qualities contribute to employees' ability to innovate, find new solutions, and adapt to changing circumstances.

All of these are essential in today's rapidly changing business environment. Furthermore, human capital performance is a multidimensional concept that includes various aspects of an employee's background and personality (Salman, 2023). The importance of human capital performance in the broader field of intellectual capital is of great importance, as human capital is not only a component but also the core of intellectual capital (Al-Delavi et al., 2023). This statement is based on the understanding that a skilled, motivated and innovative workforce is the foundation for building competitive advantage and disruptive innovation.

Structural Capital Efficiency

Structural capital efficiency encompasses a diverse spectrum of elements that collectively form the foundation upon which a company's intellectual prowess is built (Salman, 2023). This facet of intellectual capital embraces an array of crucial components – technologies, data repositories, inventive creations, published materials, organizational culture, strategic

frameworks, structural setups, and operational systems (Abuaddous, *et al*, 2023). In essence, it is the intricate tapestry of procedures, methods, and activities that a company strategically assembles.

The significance of structural capital efficiency goes beyond its mere existence within an organization. It significantly influences the innovation process and directly contributes to the formation of innovative capital – the lifeblood of forward-looking enterprises (Sonali & Kaushala, 2023). The incorporation of advanced technologies and methodologies into operational processes, systems, and structures enhances a company's ability to not only produce goods but also effectively market and distribute them.

Structural capital efficiency comprises the efficiency of vital organizational processes, the accessibility and management of data through databases, the safeguarding of trademarks, the functionality of information systems, and even the intangible aspects of corporate culture (Abba, *et al* 2023). In simpler terms, structural capital encapsulates the legacy that remains embedded within a company even when the workforce departs at the end of the day.

Capital Employed Efficiency

Employed capital refers to the total amount of resources strategically placed in a company's fixed and current assets (Tonye & Oruh, 2022). This includes a pool of equity and long-term debt, which are the overall sources of funds that support a company's operations. Simply put, capital employed includes the total amount of fixed assets and working capital. However, the presence of capital employed does not tell the whole story. What really matters is the efficiency with which these resources are used. Capital efficiency includes all the complexities of resource utilization in a company's production and business activities (Sonali & Kaushala, 2023).

Capital efficiency becomes a strategic means of optimization. It is similar to a performance indicator that measures an organization's ability to transform financial inputs into valuable results. This measurement of intellectual capital is not just about numbers. This reflects a company's ability to efficiently allocate resources, optimize processes, and create value (Otuya et al., 2023). Therefore, capital efficiency is a strategic tool that companies can use to achieve broader financial goals (Sonali & Kaushala, 2023). It embodies intelligent resource allocation, operational optimization and value creation, all of which contribute to improving the overall competitiveness and long-term sustainability of the business.

Corporate Financial Performance

Financial performance is a measure of how a company structures its strategies and resources (human and non-human) to generate revenue, with the sole purpose of achieving the goal of profit maximization (Abubakar et al., 2021). Mutuma (2016) pointed out that financial performance is a measure of a company's ability to utilize its assets in the normal course of business to generate a series of economic benefits for shareholders.

Mutende et al (2017) considers financial performance as a company's ability to achieve planned financial results, measured against planned results. In this study, financial performance is considered as the ability of a company to utilize its assets to generate revenue in order to achieve the goal of profit maximization. Performance measurement is fundamental in the field of accounting and finance, as proper evaluation of financial status and performance tends to improve the value and performance of a company (Dankwah et al., 2024).

Corporate performance refers to the utilization of a company's resources within its core business to efficiently generate revenue (Sonali & Kaushala, 2023). Or it may involve achieving specific business objectives measured against predefined criteria, goals, and costs.

Performance reflects the extent to which a company achieves its strategic goals and objectives while making optimal use of its resources (Uagbale-Ekatah & Ofurum, 2022).

Business efficiency refers to an indicator of the overall competitiveness of an economic entity. This provides insight into the level of achievement of a company's strategic objectives (Habib and Dalwai, 2023).

However, as such measures are only available to publicly traded companies, market approaches are often influenced by forces beyond management's control (Galant & Cadez, 2017). Furthermore, the market approach focuses on market attributes that are not specific to a particular company, such as recessions (Galant & Cadez, 2017). Previous studies (Garcia-Castro et al., 2010; Rodgers et al., 2013) have used both approaches using measures such as Tobin's Q and MVA. Other researchers (Peng & Yang, 2014) used a comprehensive measure of financial performance by combining various existing measures (ROA, ROE, EPS, cash flow to assets, etc.) to form a single integrated measure. This study considers both approaches in order to identify the achievement of a company's short-term and long-term financial objectives, namely profit maximization. However, achieving these goals depends on the effective and efficient use of a company's intellectual capital.

Empirical Review

Wilson and Eke (2025) investigated the relationship between intellectual capital performance and financial performance of Nigerian information and communication technology (ICT) companies. This study used a combination of explanatory and descriptive research on a seven-year dataset from 2017 to 2023. Panel least squares (PLS) regression method was used to establish the relationship between explanatory and dependent variables. The results revealed that there is a clear and significant relationship between HCE and the financial performance of listed ICT companies in Nigeria. The study also revealed that there is a negative and significant relationship between ROCE and the financial performance of listed ICT companies in Nigeria.

Amin, Stephen, and Brian (2025) obtained observational evidence on the efficiency of capital employed, efficiency of human resources, and structural efficiency of capital regarding the financial performance of Indonesia Stock Exchange from 2021 to 2023. Twenty-nine tests met criteria using targeted testing methods. The model used in this study is a Microsoft Excel program and is processed using the E-views 10 program. The results of this study show that the capital employed, the efficiency of human resources, and the efficiency of structural capital simultaneously have a significant impact on financial performance. Financial performance is significantly influenced by human resource efficiency and structural capital efficiency factors.

Arumona et al. (2023) studied the link between intellectual capital and financial performance of seventy-six (76) quoted non-financial corporations in Nigeria for the period of ten (10) years from 2012 to 2021. Intellectual capital was decomposed into human capital efficiency, capital employed efficiency, and structural capital efficiency while financial performance was proxied with return on assets (ROA). The data obtained were analyzed using panel regression technique and found a negative and significant relationship between human capital efficiency and structural capital efficiency and financial performance in Nigeria. The study also found a

positive and significant connection between capitals employed efficiency and financial performance in Nigeria.

Nguyen (2023) assessed the impact of intellectual capital on the financial performance of service sector enterprises in Vietnam from 2005 to 2014. Using a two-stage GMM model, the results show that while human capital efficiency and capital efficiency have a positive impact on firm performance, the impact of structural capital efficiency is inconsistent across knowledge intensity and service activity levels.

Chukwuekwu (2023) investigated the impact of intellectual capital on the growth of companies listed on the Nigerian Stock Exchange. The sample size for this study was a sample of 10 publicly traded consumer goods companies over a 10-year period (2011-2020). Regression analysis techniques were used to study the influence of intellectual capital and its components on the growth of business sustainability.

The analysis found that physical, human, structural, and relational capital has a significant positive impact on predicting sustainable business growth.

Putri et al (2023) analyzed the impact of intellectual capital on financial performance and firm value in the Indonesian automobile industry. This study focused on automakers listed on the Indonesia Stock Exchange from 2014 to 2021. To test the hypotheses, the study used partial least squares (PLS) analysis. The hypothesis testing results show that intellectual capital has a positive and significant impact on financial performance.

Otuya et al (2023) investigated how intellectual capital performance contributes to shareholder wealth creation in Nigeria from 2011 to 2022. This study used VAIC model to estimate intellectual capital and used descriptive statistics and diagnostic tests before regression analysis. The results revealed a significant positive relationship between value-added intelligence index (VAIC) as a measure of intellectual capital and shareholder wealth.

Abba, Hamidu et al (2023) established the impact of intellectual capital on corporate value of listed technology companies in Nigeria. For the period 2012-2020, the workforce of 7 out of 9 companies was selected. The research results obtained through correlation analysis and multiple regression analysis show that intellectual capital has a negative and significant impact on corporate value.

Olohunlana et al (2023) identified the extent of intellectual capital effectiveness and factors influencing its effective utilization in listed commercial banks in Nigeria. This study uses data envelopment analysis (DEA) of annual financial statements from 2013 to 2019 to assess the intellectual capital performance of these banks. Next, this study uses Tobit regression to analyze the influence of firm-specific factors on intellectual capital performance. The results showed that only 8.33% of the Nigerian commercial banks surveyed are effectively optimizing their intellectual capital, while 91.67% are inefficient.

Misdar (2023) analyzed the impact of intellectual capital on the financial performance of banks listed on the Indonesia Stock Exchange from 2019 to 2021. The data used in this study is secondary data obtained from the financial statements of banking companies. Linear regression tests were used to test the research hypotheses that showed that human capital, structural capital, and relational capital have a positive impact on a firm's financial performance (FP).

Akintoyi et al (2022) investigated the relationship between intellectual capital and organizational performance of 35 listed financial companies in Nigeria over a 10-year period from 2010 to 2019. Intellectual capital was captured using VAIC decomposed into human

capital efficiency, structural capital efficiency, and capital efficiency, while organizational efficiency was measured using ROA, return on equity (ROE), leverage (LEV), and asset turnover. The data collected was analyzed using panel regression technique and revealed that there is a clear and significant relationship between intellectual capital and organizational performance in Nigeria.

Tonye and Oruh (2022) investigated the effect of intellectual capital efficiency on economic value of listed consumer firms in Nigeria for the period of 2016-2020. The result of the regression analysis showed that Human capital efficiency and Structural capital efficiency has positive and significant impact on economic value (ROA). However, Capital employed efficiency shows negative and non-significant effect on economic value in Nigeria.

Rufus, Festus and Dada (2022) examined the effect of intellectual capital on organisational performance of financial companies quoted in Nigeria. The study adopted *Ex-Post Facto* research design. The audited financial statements from 2010 to 2019 validated by the external auditors' report were the data source. Descriptive and inferential statistics using regression analyses were employed. The study found that human capital efficiency and structural capital efficiency has a non-significant positive effect on organizational performance whereas capital employed efficiency has a significant positive effect on firm performance.

Methodology

This study adopted an *ex-post facto* research design, specifically utilizing the casual-comparative method. Ex-post facto research comprises a study where the researcher works with independent variables that cannot be manipulated during the research process.

Population and Sample Size of the Study

The population of the study consists of the six information communication technology (ICT) firms quoted on the Nigerian Exchange Group. The study covered ten years annual reports and accounts of these companies from 2013 to 2024. The firms are Chams Plc, Courteville Plc, CWG (Computer Warehouse) PLC, E-TRANZACT, NCR Nigeria Plc and Tripple Gee. The researcher employed consensus sampling to choose all the six ICT firms in Nigeria.

Method of Data Collection

The research employs secondary data sourced from audited annual reports and accounts of the chosen companies. The data is extracted from the Statement of Financial Position and the Statement of Profit or Loss and Comprehensive Income. This dataset spans duration of eleven years, from 2013 to 2024. Annual reports and accounts are considered reputable and dependable sources as they bear the endorsement of the management, gain approval from the Security and Exchange Commission (SEC), and undergo external audit scrutiny.

Model Specification

The study adapted the model by Tonye and Oruh (2022)

EVA = a0 + a1 HCEit +b2 SCEit +b3 CEEit +u

Where;

A0 = constant

EVA = Economic Value (ROA)

HCE = Human capital efficiency

SCE = Structural capital efficiency

CEE = Capital employed efficiency

The model above was modified to produce the specific model suitable for the study.

$ROE_{it} = \beta 0 + \beta_1 CEE_{it} + \beta_2 SCE_{it} + \beta_3 HCE_{it} + \varepsilon_{it}$ i

Where:

ROE is Return on Asset, calculated as earnings after-tax/total asset
CCE is Capital Employed Efficiency, which is calculated as (Value Added)/(Capital Employed)
SCE is Structural Capital Efficiency, which is calculated as (Structural Capital)/(Value Added)
HCE is Human Capital Efficiency, which is calculated as (Value Added)/(Human Capital)
$\beta_{1\text{-}3}$ represents the regression coefficient;
ε represents the error term;
i represents individual firms and t represents the time/year.

Method of Data Analysis

The analysis of data for this research based on the data collected from publications of the Nigerian exchange Group and the annual reports of the quoted companies. Both the dependent and independent variables were computed from the data gotten from the Nigerian Exchange Group from 2013 to 2024.

Descriptive statistics employed to summarily describe the mean, median, standard deviation, kurtosis and skewness of the study variables. Inferential statistics will also be utilized with the aid of E-Views 9 using:

i. Coefficient of correlation: which is a good measure of relationship between two variables that tell us about the strength of relationship and the direction of the relationship as well?
ii. Multiple regressions analysis: Regression analysis predicts the value the dependent variable based on the value of the independent variable and explains the impact or effect of changes in the values of the variables.

Decision Rule

Accept the alternative hypothesis, if the Probability value (P-value) of the test is less than 0.05 (5%). Otherwise reject.

Data Analysis

Table 1: Descriptive Analysis

	ROE	CEE	SCE	HCE
Mean	0.076667	0.359167	-0.874167	1.367500
Median	0.065000	0.440000	0.325000	1.485000
Maximum	0.260000	0.530000	0.590000	2.450000
Minimum	-0.130000	-0.010000	-13.62000	0.070000
Std. Dev.	0.106258	0.157235	3.887364	0.543513
Skewness	0.135284	-1.225584	-3.004880	-0.514613
Kurtosis	2.777218	3.397730	10.05372	4.261761
Jarque-Bera	0.245677	12.33283	171.7443	5.302696
Probability	0.884406	0.002099	0.000000	0.070556
Sum	3.680000	17.24000	-41.96000	65.64000
Sum Sq. Dev.	0.530667	1.161967	710.2452	13.88410
Observations	48	48	48	48

Source: E-View output, 2025

Interpretation of Descriptive Statistics

The descriptive statistics in table 1 showed that the return on equity of the sampled companies is 0.077; the maximum of 0.260 with a minimum of -0.130 with a standard deviation of 0.106. The mean of capital employed efficiency (CEE) has mean of 0.359; standard deviation of 0.157; a maximum observation of 0.530 with a minimum value of -0.010. The mean value of structural capital efficiency (SCE) is -0.874, a standard deviation of

3.887; maximum observation of 0.590 with a minimum value of -13.620. The average mean of human capital efficiency (HCE) is 1.368; standard deviation of 0.544; a maximum observation of 2.450 with a minimum value of 0.070.

Skewness is the measure of how much the probability distribution of a random variable deviates from the normal distribution. Table 1 outlines that the probability distribution for ROE (0.884); CEE (0.002), SCE (0.000) and HCE (0.071) are positively skewed distribution.

Table 2: Pearson Correlation Matrix

	ROE	CEE	SCE	HCE
ROE	1			
CEE	-0.00016	1		
SCE	-0.49712	0.73487	1	
HCE	0.07899	0.75435	0.75479	1

Source: E-Views 9.0 Correlation Output, 2025

The Pearson Correlation Matrix in table 2 shows the existence of a negative relationship between CEE, SCE and ROE at a coefficient value of -0.000, and -0.497 while HCE (0.079) has a positive association with return on equity.

Test of Hypotheses

In other to examine the significant effect between the dependent variable return on equity and the independent variables (CEE, SCE and HCE) and to also test our formulated hypotheses, we used a pooled multiple regression analysis since the data had both time series (2013-2024) and cross sectional properties of Nigerian information communication technology (ICT). The pooled interaction based multiple regression results are presented and discussed in Table 3 below.

Table 3: OLS Regression Analysis Result

Dependent Variable: ROE
Method: Panel Least Squares
Date: 10/24/25 Time: 11:04
Sample: 2013 2024
Periods included: 12
Cross-sections included: 4
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.290195	0.034104	-8.509150	0.0000
CEE	0.284013	0.076764	3.699812	0.0006
SCE	-0.039785	0.003107	-12.80366	0.0000
HCE	0.168245	0.022961	7.327536	0.0000

R-squared	0.791467	Mean dependent var	0.076667
Adjusted R-squared	0.777249	S.D. dependent var	0.106258
S.E. of regression	0.050150	Akaike info criterion	-3.067939
Sum squared resid	0.110661	Schwarz criterion	-2.912005
Log likelihood	77.63053	Hannan-Quinn criter.	-3.009011
F-statistic	55.66608	Durbin-Watson stat	2.007775
Prob(F-statistic)	0.000000		

Source: E-Views 9.0 Correlation Output, 2025

Interpretation of Regression Result

In table 3, R-squared and adjusted Squared values were (0.79) and (0.78) respectively. The result shows that all the independent variables jointly explain about 78% of the systematic changes in return on equity of our samples firms over the eleven years periods (2013-2024). Table 3 indicates an adjusted R^2 value of 0.78. The adjusted R^2, which represents the coefficient of multiple determinations shows that 78% of the total variation in the dependent variable (ROE) of listed ICT firms in Nigeria is jointly explained by the explanatory variables (CEE, SCE, and HCE). The adjusted R^2 of 78% did not constitute a problem to the study because the F- statistics value of 55.66608 with an associated Prob.>F = 0.000 indicates that the model is fit to explain the relationship expressed in the study model and further suggests that the explanatory variables are properly selected, combined and used. The value of adjusted R^2 of 78% also shows that 22% of the variation in the dependent variable is explained by other factors not captured in the study model.

Test of Autocorrelation: using Durbin-Waston (DW) statistics which we obtained from our regression result in table 3, it is observed that DW statistics is 2.007 and an Akika Info Criterion and Schwarz Criterion which are -3.068 and -2.912 respectively also further confirms that our model is well specified. In addition to the above, the specific findings from each explanatory variable are provided as follows:

Hypothesis One

$H0_3$: Capital employed efficiency does not significantly affect return on equity of listed information communication technology firms in Nigeria.

Table 3 indicates that capital employed efficiency of the firm has a positive significant effect on return on equity of listed information communication technology firms in Nigeria. This can be observed from the beta coefficient (β_1) of 0.284013 with p-value of 0.001 which is statistically significant at 5% level of significance.

Since the P-value of the test was 0.001 less than 0.05 (5%)., this study upholds that capital employed efficiency of the firm has a positive significant effect on return on equity of information communication technology firms in Nigeria Thus, null hypothesis is Rejected and alternative hypothesis Accepted**.**

Hypothesis Two

$H0_2$: Structural capital efficiency does not significantly affect return on equity of listed information communication technology firms in Nigeria.

Table 3 indicates that structural capital efficiency of the firm has a positive significant effect on return on equity of listed information communication technology firms in Nigeria. This can be observed from the beta coefficient (β_1) of -0.039785 with p-value of 0.000 which is highly statistically significant at 5% level of significance.

Since the P-value of the test was 0.000 less than 0.05 (5%)., this study upholds that structural capital efficiency of the firm has a negative significant effect on return on equity of information communication technology firms in Nigeria Thus, null hypothesis is Rejected and alternative hypothesis Accepted.

Hypothesis Three

$Ho_{1:}$ Human capital efficiency does not significantly affect return on equity of listed information communication technology firms in Nigeria

Table 3 indicates that human capital efficiency of the firm has a positive significant effect on return on equity of listed information communication technology firms in Nigeria. This can be observed from the beta coefficient (β_1) of 0.168245 with p-value of 0.000 which is highly statistically significant at 5% level of significance.

Decision

Since the P-value of the test was 0.000 less than 0.05 (5%)., this study upholds that human capital efficiency of the firm has a positive significant effect return on equity of information communication technology firms in Nigeria Thus, null hypothesis is Rejected and alternative hypothesis Accepted.

Conclusion and Recommendations

The study determined the effect of intellectual capital on the corporate performance of listed information communication technology firms in Nigeria, using capital employed efficiency, and structural capital efficiency and human capital efficiency, as the independent variables, while return on equity represent the dependent variable. The study included six listed companies in the information and communication technology sector that are members of the Nigeria Exchange Group.

Companies that recognize the importance of intellectual capital and incorporate it strategically into their business strategies actively invest in developing and maintaining intellectual capital through employee training and development programs, develop a culture of knowledge sharing, and foster innovation and creativity. The negative impact on return on equity highlights the important role of qualified, motivated and well-managed human resources in the consumer goods sector. In an environment where innovation and adaptability are essential, weaknesses in human capital management can lead to higher costs, lower productivity, and ultimately lower returns on capital.

The negative impact on return on equity highlights the importance of optimizing organizational structures, processes and technology. Companies that fail to adapt to changing market dynamics and technological advances may experience increased operating costs, reduced competitiveness and, as a result, reduced return on equity.

The positive correlation with return on equity highlights the importance of prudent financial management and optimal capital allocation. Companies that strategically allocate their total capital by balancing debt and equity and investing in high-return projects are likely to achieve higher profitability, which in turn positively impacts return on equity. Addressing human and structural capital issues will therefore be essential to achieving sustainable growth and profitability in the competitive ICT sector.

Recommendations

1. The recognition of the positive correlation between capital efficiency and return on equity encourages agricultural enterprises in Nigeria to focus on optimizing asset utilization, prudently managing debt levels, and implementing strategic investment decisions to improve overall financial performance.

2. Leaders of information and communication technology companies in Nigeria should prioritize streamlining processes, improving intellectual property management, and optimizing supply chain operations.

3. By addressing these structural issues, companies can improve their financial performance and remain competitive in the marketplace.

4. Information and communication technology companies should consider making strategic investments in employee training and development to improve overall productivity and, in turn, financial performance.

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