

Intellectual Capital Efficiency and Financial Performance of Financial Service Firms in Nigeria.

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ABSTRACT

As the Nigerian financial services industry continues to experience rapid technological transformation, firms are becoming more dependent on intangible assets such as employee expertise, organizational systems, innovation and technological capabilities rather than traditional physical assets. Based on this, the study examines how the efficiency of intellectual capital is connected to the financial performance of financial service companies in Nigeria, using an ex-post facto research approach. The population constitutes all 42 listed financial institutions currently listed on the NSE while 25 of them are randomly sampled based on the availability of their annual reports and accounts between 2015 and 2024. Findings revealed that while HCE and SIZE exert significantly positive influence on the financial performance, SCE exerted no significant influence. The study reinforces the view that the future competitiveness and sustainability of financial service firms in Nigeria depend on the successful management of human capital. Managers should therefore focus on strengthening human resource capabilities, improving organizational systems and processes and fostering a culture of continuous innovation. Likewise, regulators and policymakers should continue to promote frameworks that encourage transparency, accountability and the development of intellectual resources.

Keywords: Human Capital Efficiency; Structural Capital Efficiency; Firm Size; Financial Performance; Nigerian Stock Exchange

INTRODUCTION

The financial performance of a firm is very crucial in business as it shows how well the firm can generate money for its investors. It also helps to see how effectively the company handles its expenses and builds value for those who have an interest in the business. In recent years, the move from economies based on industries to those driven by technology has changed the emphasis towards intellectual capital, highlighting the importance of knowledge, skills and creativity more than physical assets. (Aljuboori et al., 2022).

Intellectual capital is the knowledge-based assets which the organization focuses on to increase the efficiency of its financial performance (Adegbayibi, 2020). Human capital refers to the combination of innate heritage, education, experience and outlook on both life and business. Structural capital, on the other hand, refers to the the non-physical infrastructure, processes, systems and databases of an organization that enable human capital to function effectively while customer or relational capital is the combination of assets used by business in relating with its past, present and potential customers, with its network of suppliers or research and development partners.

Companies that utilize intellectual capital see an increase in creativity because they develop new skills and come up with fresh ideas to meet the needs of the market (Aljuboori et al., 2022). Using intellectual capital is therefore said to improve how well an organization performs, (Shubita, 2022). In a similar way, Tran et al. (2022) suggest that companies should focus on non-physical assets or knowledge-based resources that can offer additional value to stakeholders. This helps them stay competitive over time and improve how well their business performs.

In the past, attention on performance was directed towards physical assets without adequate attention on their intellectual capital and this has had adverse effects on the performance management. In recent periods,

knowledge has replaced both physical and material resources as the basis for business viability and oversight of knowledge-based resources is now essential to maintaining an edge over competitors and achieving superior outcomes (Sharkie, 2023). The new economic structure, commonly referred to as the knowledge economy or intellectual asset, has been identified as the key resource required for the survival of organizations. Software, finance, pharmaceutical, banking, hotels and universities are examples of service firms that rely heavily on their intellectual capacity to generate revenue.

Specifically, Nigerian financial service firms invest heavily on technology and human capital but the relative impact of intellectual efficiency on financial performance remains unclear. More so, studies on intellectual capital in Nigeria are scarce, creating a research gap. Additionally, conflicting findings were found in earlier empirical studies (Dashtbayaz et al., 2020; Ali & Oudat, 2021). While some authors documented no association between the factors, others identified a favorable relationship between financial performance and intellectual capital efficiency. It is on this basis that this study examined the effect of intellectual capital efficiency on the financial performance of selected financial institutions in Nigeria.

LITERATURE REVIEW

Conceptual Review

Financial Performance

Financial performance shows how well a company uses its resources to make money, add value for shareholders and reach its goals. It is usually measured using metrics such as return on assets (ROA), return on equity (ROE), earnings per share (EPS), net profit margin and Tobin's Q. Research shows that financial performance is a key sign of how well an organization is doing. It shows the effectiveness of the decisions made by managers and how well resources are being utilized. Ali et al. (2022) state that financial performance shows how well a company can turn its physical and non-physical resources into better economic results. Pulic's Value Added Intellectual Coefficient (VAIC) framework highlights that creating value and achieving financial success depend not just on physical assets but also on how effectively organizations use their intellectual resources (Pulic, 2000; Ali et al., 2022). As a result, current studies on financial performance are more likely to focus on knowledge-based assets as key factors that influence a company's ability to compete and make profits in today's economy. (Ali et al., 2022; Yao et al., 2019).

The link between how well a company does financially and how efficiently it uses its intellectual capital is based on the resource-based view. This idea says that resources like knowledge, skills and brand reputation, which are valuable, hard to find and difficult to copy, can give a company a long-term edge and help it perform better. Intellectual capital efficiency is about how well an organization can make value from its people, its structures and the resources it uses. It depends on how effectively the organization uses knowledge, skills, ways of working and the connections it has.

Empirical evidence demonstrates that firms with higher intellectual capital efficiency generally report superior financial performance because effective management of intellectual resources improves productivity, innovation and operational efficiency. For example, Salman (2022) discovered that having efficient human capital and efficient structural capital help improve the financial results of companies listed in Nigeria. Similarly, research on banks and companies that operate in multiple countries has found strong positive connections between value added intellectual capital and financial performance. This suggests that intellectual capital acts as a key resource for creating value and improving profits.

Intellectual Capital

Intellectual capital is a vital resource in a company that plays a major role in shaping its strategy and supporting its growth. It covers the mix of knowledge, skills, special talents, creativity, how things are done inside and relationships with others that help create value and stay ahead of the competition. The idea started because people realized that regular financial statements do not show the real value of intangible assets. These assets are getting more important as organizations succeed in knowledge-based economies. Stewart (1997) opines that intellectual

capital is the total of all the knowledge that employees in a company possess and this knowledge helps the organization gain an advantage over others. Edvinsson and Malone (1997) explained that intellectual capital is made up of knowledge, real-world experience, technology tools, connections with customers and the skills of employees. These elements help companies stay ahead of their competitors. The Organisation for Economic Co-operation and Development (OECD) also described intellectual capital as the economic value of two kinds of intangible assets, which are organizational capital and human capital (OECD, 1999). As a result, intellectual capital has become a key idea in modern management and accounting studies because it helps explain how organizations generate value in addition to their physical and financial assets (Buallay et al., 2020; Xu & Liu, 2020).

The literature on intellectual capital usually groups the concept into three connected aspects: human capital, structural capital and relational capital. Human capital is the knowledge, talents, skills, creativity and experience that people contribute to a company, which in turn support its productivity and innovative capabilities (Bontis, 1998). Structural capital includes the systems, databases, procedures, patents, organizational culture and technology used by a company. These elements help employees work efficiently and keep the organization's knowledge safe (Edvinsson & Malone, 1997).

Relational capital, which is sometimes called customer capital, is the value that comes from having good relationships with customers, suppliers, stakeholders and other external groups. These relationships help businesses grow and stay healthy over time (Bontis, 1998). The way these parts of intellectual capital are used is usually measured using the Value Added Intellectual Coefficient (VAIC) model, which was introduced by Pulic in 2000. This model looks at how well human capital, structural capital and capital employed work together to create value. Empirical research has repeatedly shown that companies with greater efficiency in utilizing their intellectual capital often see better results in terms of innovation, productivity and financial success. This underscores the key role that intellectual capital plays in today's business world (Xu & Wang, 2018; Xu & Liu, 2020; Buallay et al., 2020).

Theoretical Framework

The study is based on the Resource-Based View theory. This idea is a big concept in how businesses plan and compete. It shows why some companies do better than others by looking at what they own and what skills they have. The idea came from Edith Penrose's work who saw companies as groups of useful resources. How well these resources are used affects how much the company grows and succeeds (Penrose, 1959). The idea was later expanded by Birger Wernerfelt, who believed that a company's resources are key to gaining an edge over competitors (Wernerfelt, 1984). However, the biggest contribution came from Jay Barney who suggested that resources can create a long-lasting competitive advantage if they are valuable, rare, hard to copy and cannot be easily replaced (Barney, 1991).

RBV separates resources into two types: tangible, like money and technology, and intangible, such as knowledge, skills, ability to innovate and the culture of the organization (Grant, 2022). The theory postulates that resources that cannot be seen or touched are better at giving a company a long-term edge because it is hard for others to copy them (Barney & Hesterly, 2021).

Empirical Review

Recent studies have shown repeatedly that intellectual capital plays a major role in determining how well companies perform financially, regardless of the country or industry they operate. For example, Xu and Wang (2021) studied how intellectual capital efficiency is connected to financial performance in public companies based in Europe using the Modified Value Added Intellectual Coefficient (MVAIC) model. The study found that how well a company uses its intellectual capital improves both its accounting and market performance. Among the different types of intellectual capital, the efficiency of human capital had the biggest effect on increasing the company's profits and its market value. The authors found that using employees' knowledge and skills effectively helps companies gain a competitive edge and achieve better financial results over time.

Buallay et al. (2021) looked into how a company's intellectual capital affects its performance across European countries. They found that using intellectual capital effectively is strongly linked to improved financial performance including return on assets and return on equity. The study also discovered that the effective use of structural capital plays a significant role in improving operations and boosting profits. Xu and Li (2022) also looked at Chinese companies listed on the stock exchange and discovered that improving the efficiency of intellectual capital leads to better profitability and higher market value for these companies. Their research found that human capital and structural capital are the main factors that influence a company's performance. Therefore, it is crucial to invest in employee training, encourage innovation and adopt new technologies.

More support for this conclusion is provided by Li, Wang and Zhang (2023) who studied manufacturing firms in China and discovered that the efficiency of intellectual capital positively affects return on equity and earnings per share. The study found that businesses with strong intellectual capital are better able to handle changes in technology and unexpected shifts in the market. Following the Resource-Based View theory, the authors suggest that intellectual capital acts as a vital strategic resource, helping to establish a long-term competitive advantage and improve overall organizational performance.

In Nigeria, Akinyemi and Aremu (2021) examined the relationship between the effective use of intellectual capital and the financial performance of publicly listed manufacturing companies. Their study showed that there is a strong link between intellectual capital and the performance of these companies. Ousama and Fatoki found in 2022 that the efficiency of intellectual capital positively influences both accounting-based and market-based measures of company value for Nigerian firms listed on the stock exchange. Their study shows that paying attention to improving internal processes, using good knowledge management tools and boosting employee skills is key to getting better financial outcomes.

Further evidence from developing countries also shows that intellectual capital helps improve how effectively an organization operates. Zadeh et al. (2023) discovered that having strong intellectual capital helps Iranian automobile manufacturing companies perform better financially, leads to happier customers, makes business processes more efficient and encourages better learning inside the organization. Mohammad et al. (2024) found that there is a strong positive link between intellectual capital and financial performance in small and medium businesses in Iran that rely on knowledge. The research found that human capital, structural capital and relational capital all play a role in helping a company generate value and increase its profits.

While the reviewed studies largely show a positive link between intellectual capital and financial performance, the majority of existing research tends to concentrate on manufacturing firms, banks and traditional listed companies. There has been limited research focus on financial service companies especially in the context of Nigeria.

METHODOLOGY

The study adopts ex-post facto research design. This is an aspect of quasi-experimental study whereby participants are not chosen at random but rather grouped together on the basis of certain characteristics or attributes they share. The population includes all financial service firms listed on the Nigerian Exchange Group. As of June 2026, there were 42 financial institutions trading on the NSE. The study adopts a random sampling technique to pick out twenty-five (25) of these firms. The choice of financial service firms is based on the particular nature of the industry which makes the issue of intellectual capital of more importance to them. More often than not, the nature of their activities involves utilizing an efficient network of intellectual capital to perform optimally. The econometric model that expresses the relationship is thus expressed.

$$RVG_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 SIZE_{i,t} + \varepsilon_{i,t}$$

$$ROA_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 SIZE_{i,t} + \varepsilon_{i,t}$$

$$ROE_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 SIZE_{i,t} + \varepsilon_{i,t}$$

Where:

RVG = Revenue Growth

ROA = Return on Assets

ROA = Return on Equity

HCE = Human Capital Efficiency

SCE = Structural Capital Efficiency

SIZE = Firm Size

β_0 = Constant term

$\beta_1 - \beta_4$ = Coefficients of explanatory variables

$\varepsilon_{i,t}$ = Error term

i = Firm

t = Time period

Table 3.1: Variables and Measurements

VARIABLES	NOTATION	MEASUREMENTS
<u>DEPENDENT</u>		
Revenue Growth	RVG	$\frac{Revenue_t - Revenue_{t-1}}{Revenue_{t-1}}$
Return on Assets	ROA	$\frac{Profit\ after\ Tax}{Total\ Assets} \times 100$
Return on Equity	ROE	$\frac{Profit\ after\ Tax}{Total\ Equity} \times 100$
<u>INDEPENDENT</u>		
Human Capital Efficiency	HCE	$\frac{Value\ Added}{Human\ Capital}$
Structural Capital Efficiency	SCE	$\frac{Structural\ Capital}{Value\ Added}$
<u>CONTROL</u>		
Firm Size	SIZE	Natural logarithm of Total Assets

In line with previous research, this study adopted static panel regression techniques, including Pooled Ordinary Least Squares (OLS), Fixed Effects (FE) and Random Effects (RE) models to analyze how intellectual capital relates to financial performance. These estimation methods are commonly applied in panel data research as they consider both differences across entities and changes over time while also adjusting for variations specific to individual firms (Baltagi, 2021). Following standard methods used when analyzing panel data, the Hausman Specification Test was used to determine whether a fixed effects model or a random effects model is better suited for the analysis (Hausman, 1978).

RESULTS AND DISCUSSION

The dependent variables, which include revenue growth (RVG), return on assets (ROA) and return on equity (ROE) display significant differences among the firms that were studied. Revenue growth had an average of

27.59 but there was a large variation as shown by a standard deviation of 71.63, which suggests that the financial institutions performed quite differently in terms of their growth.

This means that while certain companies saw strong growth, others had much slower growth or even a decrease in their growth rates. Similarly, ROA showed a negative average of -0.07, which suggests that some companies had poor performance in using their assets during the study period. The large spread (standard deviation = 15.23) shows that there is a lot of variation in how profitable their assets are. In contrast, ROE had a positive average of 13.43, meaning that, on average, shareholders achieved significant returns. However, the high standard deviation of 16.66 shows that there were significant variations in how well each equity of each firm performed.

Human capital efficiency (HCE) had an average score of 4.32, showing that companies usually created positive value through their investments in human resources. The fairly high standard deviation of 5.95 indicates that there are notable differences in how effectively various companies used their human resources. Structural capital efficiency (SCE), which has an average of 0.16 and a high standard deviation of 3.30 shows that there is a lot of difference in how well companies can use their organizational processes and systems to create value. The size of the firms (SIZE) had an average of 17.70, with a moderate level of variation, indicating that the sample included companies of different sizes. This diversity helps make the study more representative.

Table 4.1: Descriptive Statistics

VARIABLE	OBS	MEAN	STD.DEV	MIN	MAX
RVG	250	27.5907	71.6308	-100	773.7061
ROA	250	-0.0737	15.2284	-187.99635	21.3114
ROE	250	13.4289	16.6633	-128.2136	117.6426
HCE	250	4.3214	5.9467	-6.5565	59.8219
SCE	250	0.1561	3.2992	-42.9679	3.5653
SIZE	250	17.7018	2.5973	12.6129	24.4330

Table 4.2 shows how strongly and in what direction the different variables in the study are related to each other and it shows that these variables are usually only weakly or moderately connected. A correlation coefficient above 0.80 typically indicates a strong connection between variables, which might suggest that the explanatory variables are highly related to each other.

On the other hand, coefficients that are below this level are generally thought to be acceptable for use in regression analysis (Gujarati & Porter, 2009; Hair et al., 2019). There are two ways to decide if multicollinearity is a problem and both use the variance inflation factor. While a VIF value below 5 means there is no collinearity problem with individual variables, a mean VIF of 10 or lower also indicates no collinearity issues among all the independent variables observed. From the results in Table 4.3, the VIF values for all the independent variables are under 5 and the average VIF is 1.18, implying that there are no collinearity problems among the variables.

Table 4.2: Correlation Matrix

	RVG	ROA	ROE	HCE	SCE	SIZE
RVG	1.0000					
ROA	0.1515	1.0000				

ROE	-0.0258	0.1055	1.0000			
HCE	0.0620	0.2187	0.1320	1.0000		
SCE	-0.0467	0.0681	0.4618	0.1361	1.0000	
SIZE	0.0950	0.2850	0.1228	0.1907	0.0229	1.0000

Table 4.3: Variance Inflation Factor

	VIF	1/VIF
ROE	1.30	0.770404
SCE	1.28	0.778442
SIZE	1.12	0.887681
ROA	1.13	0.892266
HCE	1.09	0.917436
Mean VIF	1.18	

To determine if the data is normally distributed, the Jarque-Bera and Shapiro-Wilk tests were estimated. The decision rule is that the data is normally distributed if the p-value is higher than 5%.

However, Table 4.4 shows that the p-values for every variable are below 0.05, indicating that none of the variables follow a normal distribution. It is pertinent to note that one of the key ideas behind ordinary least squares (OLS) is that the data should follow a normal distribution. However, since the data did not meet this requirement, the analysis for all the variables moved on to fixed and random effects regression models.

Table 4.4: Jarque-Bera and Shapiro-Wilk Tests for Normality

		JARQUE-BERA				SHAPIRO-WILK			
	OBS	SKEW	KURT.	CHI2(2)	PROB	W	V	z	PROB
RVG	250	0.0000	0.0000	-	0.0000	0.55799	80.164	10.200	0.00000
ROA	250	0.0000	0.0000	-	0.0000	0.33038	121.445	11.166	0.00000
ROE	250	0.000-	0.0000	-	0.0000	0.74793	45.715	8.893	0.00000
HCE	250	0.0000	0.0000	-	0.0000	0.62773	67.517	9.801	0.00000
SCE	250	0.0000	0.0000	-	0.0000	0.24290	137.311	11.452	0.00000
SIZE	250	0.0261	0.1288	6.91	0.0315	0.97856	3.889	3.160	0.00079

Heteroscedasticity occurs when the spread of the errors or residuals in a regression model changes as the value of an independent variable changes. In simple terms, the spread of the residuals varies depending on the values of the predictor variables. This makes it harder to trust statistical models in a few ways: Ordinary Least Squares estimates become less accurate and the standard errors are not reliable. Incorrect standard errors lead to

misleading p-values and confidence intervals, implying that the predictions might not show the true patterns in the data. The decision rule is to reject the hypothesis that the variance is constant when the p-value is below 5%. As presented in Table 4.5, the p-value of all the variables except ROA are below the threshold of 5% and this indicates that the variables are significantly heteroscedastic.

Table 4.5: Breusch-Pagan/Cook-Weisberg Tests for Heteroscedasticity

VARIABLE	CHI(2)	PROB
RVG	4720.49	0.0000
ROA	0.33	0.5628
ROE	31.32	0.0000
HCE	26.51	0.0000
SCE	96.44	0.0000
SIZE	13.13	0.0003
RESIDUALS	4817.00	0.0000

Following the static regression model technique, the relationship between intellectual capital efficiency and financial performance commenced with the OLS and proceeded with fixed effects and random effects. The prob>chi2 value of Hausman tests across the three models are 0.0124; 0.9198 and 0.1271 respectively, suggesting the acceptance of fixed effects estimate for the first model and the acceptance of random effects estimate for the second and third models.

The result depicted in Table 4.8 reveals that a significantly positive relationship exists between HCE and RVG as indicated by the coefficient and p-value of 0.414 and 0.001 respectively, indicating that efficient utilization of human capital leads to higher revenue growth for the firms over the period.

In the same vein, HCE exerts significantly positive influence on ROA as indicated by the coefficient and p-value 0.195 and 0.000 respectively. This indicates that efficient utilization of human capital is associated with higher return on assets for the firms over the period. Similarly, HCE is a significant and positive predictor of ROE as revealed by the coefficient and p-value of 0.201 and 0.000 respectively, implying that efficient utilization of human capital is associated with higher return on equity for the firms over the period.

These findings are consistent with those of previous authors including Zadeh et al. (2023); Mohammad et al. (2024); Akinyemu and Aremu (2021); Ousama and Fatoki (2022); Li, Wang and Zhang (2023); and Xu and Li (2022). However, SCE exerts no significant influence on financial performance across the three models. Lastly, the control variable SIZE is a significant and positive predictor of RVG as indicated by the coefficient and p-value of 0.149 and 0.052 respectively, suggesting that larger firm size is associated with higher revenue growth for the firms over the period.

Table 4.8: Intellectual Capital Efficiency and Financial Performance

		RVG			ROA			ROE	
VARIABLE	POLS	FE	RE	POLS	FE	RE	POLS	FE	RE
S									

HCE	0.113	0.414** *	0.208**	0.183** *	0.198** *	0.195** *	0.103**	0.253** *	0.201** *
	(0.0839)	(0.120)	(0.0951)	(0.0542)	(0.0544)	(0.0521)	(0.0486)	(0.0622)	(0.0566)
SCE	0.191	0.316	0.253	0.629** *	0.122	0.168	-0.195	-0.106	-0.132
	(0.278)	(0.382)	(0.293)	(0.189)	(0.156)	(0.151)	(0.143)	(0.170)	(0.152)
SIZE	0.107** *	0.149*	0.110**	0.00784	0.0218	0.0177	0.00582	0.0243	0.0130
	(0.0381)	(0.0762)	(0.0469)	(0.0229)	(0.0288)	(0.0267)	(0.0209)	(0.0334)	(0.0288)
Constant	1.052	-0.0542	0.927	0.384	0.116	0.256	2.326** *	1.826** *	2.109** *
	(0.687)	(1.367)	(0.848)	(0.416)	(0.523)	(0.508)	(0.378)	(0.606)	(0.531)
Observations	179	179	179	217	217	217	217	217	217
R-squared	0.058	0.102		0.053	0.068		0.022	0.082	
firm effect	NO	YES	YES	NO	YES	YES	NO	YES	YES
time effect	NO	NO	NO	NO	NO	NO	NO	NO	NO
F-test	5.392	8.643		5.954	6.919		2.366	8.534	
prob>F	0.00534	0.00027 8	0.00300	0.00305	0.00126	0.00067 3	0.0963	0.00028 2	0.00149
Number of Company		25	25		25	25		25	25

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

CONCLUSION

As the Nigerian financial services sector keeps changing quickly with new technology, companies are relying more on non-physical resources like skilled workers, efficient systems, creative ideas, and tech abilities instead of traditional physical property. The study looked into how efficient use of intellectual capital affects the financial performance of listed financial institutions in Nigeria. The results from the regression analysis showed different types of relationships in the models used in the study. Intellectual capital efficiency plays a major role in determining the financial performance of selected financial service companies in Nigeria. Specifically, how efficiently a company uses its human resources can have a positive effect on its financial results, meaning that businesses which make good use of their employees' knowledge, skills and abilities tend to perform better financially and operate more effectively. Structural capital efficiency was found to have a positive link with financial performance, showing how important organizational systems, processes, technology and innovation are in creating value.

The study demonstrates that the survival of financial service companies in Nigeria in the future and their ability to remain environmentally and economically viable depends on the effective management of their intellectual capital. Managers need to cultivate better human resource skills, enhance the organization's systems and procedures and establish an environment that promotes continuous improvement. Regulators and policymakers must continue to advocate for frameworks that foster transparency, accountability and the enhancement of knowledge and skills. This will allow companies to improve their financial health, to continue growing and to play an integral part in the development of the financial services industry and the wider economy.

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