

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

Bolatito Sekinah Adejuwon¹; Olaniyi Olowu Ajewole²; Abel Ishola Oladeji²

¹Oyo State College of Agriculture and Technology, Igbo-Ora, Oyo State, Nigeria

²Department of Accounting and Finance, Ajayi Crowther University, Oyo, Oyo State, Nigeria

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ABSTRACT

The study investigated the influence of intellectual capital efficiency on the financial performance of listed financial service firms in Nigeria as well as the moderating role of board characteristics on this relationship. Ex-post facto research design was adopted and data extracted from the annual reports and accounts of 25 out of 42 financial institutions listed on the Nigerian Exchange Group. The data were analysed using panel data regression techniques including OLS, FE and RE while Hausman tests specified model selection across the models. Findings indicate varied association between the variables. HCE exerts significantly positive influence on the proxies of financial performance including RVG, ROA and ROE. In the same vein, BGE and BFE exhibit significantly positive influence on financial performance. Conversely, the interaction effects indicate negative moderation of BFE and BIN on the existing positive relationship. The study concludes that while making better use of intellectual capital can help improve financial results, how effective board characteristics are depends on the kind of governance practices that are in place. The study recommends that financial service companies set up governance systems that offer good oversight but also let them be flexible and adaptable in their strategies, so they can make the most of the value created by their intellectual capital.

Keywords: Intellectual capital efficiency; Board characteristics; Revenue Growth; Return on Assets; Return on Equity; Board financial expertise; Board independence; Financial service firms; Nigeria.

INTRODUCTION

The fast change from an economy based on industry to one based on knowledge has altered a number of factors that affect how well a company can operate in a competitive environment. Now, the focus is on non-physical resources that provide lasting value instead of physical assets (Li et al., 2021). In today's fast and tech-driven business environment, companies are relying more and more on knowledge and skills to come up with new ideas, run their day-to-day tasks more efficiently and manage their finances efficiently (Habib & Dalwai, 2023). For this reason, intellectual capital has become a key strategic resource for companies looking to remain competitive in fast-changing markets (Battisti et al., 2021).

ICE examines how effectively companies use their employees, their buildings and equipment and the money they have invested to create more value and achieve better results (Pulic, 2000; Habib and Dalwai, 2023). The Resource-Based theory explains that a firm can remain competitive for a long time because it has resources that are valuable, not commonly found, difficult to copy and hard to replace (Barney, 1991). Besides that perspective, the theory suggests that an organization's knowledge is its most valuable resource for creating lasting value over time (Grant, 1996). Recent research backs up these ideas, revealing that companies which use their intellectual capital more effectively tend to achieve higher profits, improved productivity, increased innovation and a higher value in the market (Li et al., 2021; Habib & Dalwai, 2023).

More and more research shows that using intellectual capital effectively can improve various financial performance indicators such as return on assets, return on equity, firm value and market capitalization (Bala et al., 2021; Habib & Dalwai, 2023). In 2021, Li and their team found that intellectual capital is a key factor in

helping the most innovative companies create more value. Habib and Dalwai (2023) also discovered that companies which manage their intellectual capital well tend to achieve better financial outcomes. Even though these findings are consistent, earlier studies have found different results in various countries, businesses and kinds of organizations. This means that the way intellectual capital influences performance can vary based on the different situations each company undergoes (Kweh et al., 2022; Bala et al., 2024).

Corporate governance is now considered an important factor that can significantly influence how effectively companies convert their intellectual capital into improved financial performance (Bala et al., 2024). In the various ways companies are run, the board of directors plays a key role because it decides the main direction of the company, reviews the choices made by top managers, and ensures the business is accountable to its owners, as noted by the OECD in 2023. Because of this, factors such as the size of the board, how independent the board operates, the number of women on the board, the financial knowledge of the board members, how frequently board meetings take place, and whether the CEO is also part of the board have become important factors that influence how well a company functions and how it performs (Bala et al., 2024; Kweh et al., 2022). Good governance allows companies to make smarter strategic decisions and use their resources in a more efficient way, particularly when it comes to investing in knowledge and expertise (Battisti et al., 2021).

Both Agency Theory and Resource Dependence Theory strongly support the idea that the makeup of a board plays a moderating role. Agency Theory suggests that strong boards help cut down on conflicts between managers and owners by keeping a closer watch on how managers act, which in turn makes the organization run better and increases the value for shareholders, as noted by Jensen and Meckling in 1976. On the other hand, Resource Dependence Theory suggests that boards help companies gain important knowledge, experience, credibility and connections outside the company, which make it easier to get access to useful strategic resources (Pfeffer & Salancik, 1978). These theoretical viewpoints indicate that the features of a board can either enhance or reduce how much intellectual capital affects financial performance, depending on how they shape the decisions managers make about creating and using knowledge-based resources (Bala et al., 2024).

Recent research studies are giving more and more evidence for this interaction. Bala and others in 2024 showed that the size of the board and the diversity of its members greatly influence how intellectual capital efficiency affects the value of companies listed in the Nigerian oil and gas sector. Kweh and their team in 2022 discovered that how independent a board is has a big impact on how efficiently intellectual capital is used, especially in bigger companies. Habib and Dalwai (2023) also suggested that the way an organization is structured in terms of governance supports intellectual capital by setting up a setting that helps use resources effectively and builds lasting value. Together, these studies suggest that companies with strong board governance are more likely to gain greater financial advantages from their intellectual capital compared to those with less effective governance (Battisti et al., 2021; Bala et al., 2024).

Even though there have been many recent studies about intellectual capital and corporate governance, a lot of important things are still not clear. Many past studies have focused on how using intellectual capital affects financial results or how the features of a board of directors alone impact company performance (Habib & Dalwai, 2023; Bala et al., 2024). Few studies have looked at how the features of a board affect its ability to use intellectual capital for better financial results, especially in emerging economies where governance is still developing (Bala et al., 2024). This restriction makes it hard to understand how intellectual capital influences the value of an organization and supports a long-lasting competitive advantage.

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 how good the decisions made by managers are and how well

resources are being used. 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, and ROA and ROE are some of the most common measures used in research studies. 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 tough 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, particularly in terms of ROA and ROE, because effective management of intellectual resources improves productivity, innovation, and operational efficiency. For example, Salman (2022) discovered that having efficient human capital, efficient structural capital, and efficient use of capital employed all 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 VAIC and financial results. 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 links with others that help create value and stay ahead of the competition. The idea started because people realized that regular financial statements don't show the real value of intangible assets. These assets are getting more important as organizations succeed in knowledge-based economies. Stewart (1997) says that intellectual capital is the total of all the knowledge that employees in a company have, 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 breaks the idea down into three related areas: human capital, structural capital, and relational capital. Human capital is the knowledge, talents, skills, creativity and experience that people bring to a company, which helps make it more productive and better at coming up with new ideas (Bontis, 1998). Structural capital includes the systems, databases, procedures, patents, the way a company works and the technology it uses. These elements help workers do their jobs better and secure the company's data (Edvinsson & Malone, 1997). Relational capital, also known as customer capital, is the value that comes from creating and maintaining strong relationships with customers, suppliers, stakeholders and other external groups. These relationships help businesses grow and keep them strong in the long run (Bontis, 1998). These intellectual capital elements are usually assessed through the Value Added Intellectual Coefficient (VAIC) model, which was created by Pulic in 2000. This model examines how effectively human capital, structural capital and capital employed work together to generate value. Studies have shown again and again that businesses which use their smart ideas and knowledge more effectively tend to become more creative, work more efficiently and achieve greater financial success. This highlights how important intellectual capital is in today's business world (Xu and Wang, 2018; Xu and Liu, 2020; and 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 (VRIN) (Barney, 1991).

RBV separates resources into two types: those that can be touched, like money and technology, and those that can't, such as knowledge, skills, ability to innovate, and the culture of the organization (Grant, 2022). The theory says that resources that can't be seen or touched are better at giving a company a long-term edge because it's 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 are in. 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.

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 success of these companies. Human capital efficiency was the main factor influencing return on assets and return on equity. 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.

Evidence from developing countries also shows that intellectual capital helps improve how effectively an organization operates. In 2023, Zadeh and their team 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 more learning inside the organization. In 2024, Mohammad and his team 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.

$$RVG_{i,t} = \beta_0 + \beta_1 BGE_{i,t} + \beta_2 BFE_{i,t} + \beta_3 BIN_{i,t} + \beta_4 HCE_{i,t} + \beta_5 SCE_{i,t} + \beta_6 HCE * BFE_{i,t} + \beta_7 SCE * BFE_{i,t} + \beta_8 HCE * BIN_{i,t} + \beta_9 SCE * BIN_{i,t} + \beta_{10} SIZE_{i,t} + \varepsilon_{i,t}$$

$$ROA_{i,t} = \beta_0 + \beta_1 BGE_{i,t} + \beta_2 BFE_{i,t} + \beta_3 BIN_{i,t} + \beta_4 HCE_{i,t} + \beta_5 SCE_{i,t} + \beta_6 HCE * BFE_{i,t} + \beta_7 SCE * BFE_{i,t} + \beta_8 HCE * BIN_{i,t} + \beta_9 SCE * BIN_{i,t} + \beta_{10} SIZE_{i,t} + \varepsilon_{i,t}$$

$$ROE_{i,t} = \beta_0 + \beta_1 BGE_{i,t} + \beta_2 BFE_{i,t} + \beta_3 BIN_{i,t} + \beta_4 HCE_{i,t} + \beta_5 SCE_{i,t} + \beta_6 HCE * BFE_{i,t} + \beta_7 SCE * BFE_{i,t} + \beta_8 HCE * BIN_{i,t} + \beta_9 SCE * BIN_{i,t} + \beta_{10} SIZE_{i,t} + \varepsilon_{i,t}$$

Where:

RVG = Revenue Growth

ROA = Return on Assets

ROE = Return on Equity

BGE = Board Gender

BFE = Board Financial Expertise

BIN = Board Independence

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 3.2: Variables and Measurements

VARIABLES	NOTATION	MEASUREMENTS
DEPENDENT		
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	$\frac{Profit\ after\ Tax}{Total\ Equity} \times 100$

INDEPENDENT		
Board Gender	BGE	$\frac{\text{Female Directors}}{\text{Total Directors}} \times 100$
Board Financial Expertise	BFE	$\frac{\text{Financial Expert Directors}}{\text{Total Directors}} \times 100$
Board Independence	BIN	$\frac{\text{Non – Executive Directors}}{\text{Total Directors}} \times 100$
Human Capital Efficiency	HCE	$\frac{\text{Value Added}}{\text{Human Capital}}$
Structural Capital Efficiency	SCE	$\frac{\text{Structural Capital}}{\text{Value Added}}$
CONTROL		
Firm Size	SIZE	Natural logarithm of Total Assets

In line with previous research, this study uses static panel regression methods, including Pooled Ordinary Least Squares (OLS), Fixed Effects (FE) and Random Effects (RE) models, to analyze how intellectual capital and board characteristics relate 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

As presented in Table 4.1, the companies have varying levels of revenue growth, return on assets and return on equity. Revenue grew on average by 27.59% but the standard deviation was very high at 71.63%, indicating that different financial institutions had very different levels of growth. This means that while some companies saw big increases, others had much less growth or even lost value. The Return on Assets (ROA) averaged -0.07, which shows that, on average, some companies were unable to efficiently utilize their assets during the time studied. With a standard deviation of 15.23, the profitability of assets is quite different across the firms. In contrast, ROE had an average of 13.43, showing that shareholders, on average, made gains. However, the high standard deviation of 16.66 shows that there was a lot of difference in how well equity performed. The average score for gender expertise on the board was 18.44, which shows that there is not much female representation on corporate boards. On the other hand, the average score for financial expertise was much higher, at 73.80, which shows that most board members have good knowledge and experience in financial matters. The BIN had an average score of 72.13, which shows that many independent directors were part of the boards of the institutions studied.

HCE averaged 4.32 as an indication that the firms were able to generate positive values from their investments in employees. The high standard deviation of 5.95 indicates varied approaches of utilising human resources across the firms. Structural capital efficiency (SCE), which has an average value of 0.16 and a high standard deviation of 3.30, shows that the firms vary a lot in how well they use their internal processes and systems to create value.

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
BGE	250	18.4373	12.9683	0	50
BFE	250	73.8013	20.0319	0	100
BIN	250	72.1264	11.8460	38.8889	94.1177

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

The table shows how closely related the variables are to each other, showing that most of them have weak or moderate connections. Revenue growth has a slight positive link with return on assets, which is 0.1515, human capital efficiency, which is 0.0620, and firm size, which is 0.0950. This suggests that no strong direct connections exist between revenue growth and these factors. Among the factors being explained, the strongest link is between ROE and SCE. The correlation coefficient is 0.4618, which shows a moderate positive connection between these two variables. All other correlations are within the usual limit of 0.70. This means the variables are not closely linked, indicating the absence of multicollinearity across the models.

There are two decision criteria for multicollinearity using variance inflation factor. While a VIF of less than 5 indicates an absence of collinearity issue on individual variables, a mean VIF of 10.0 or less indicates an absence of collinearity issues among all the observed independent variables. From the result presented in table 4.3, the VIF of all the independent variables are below 5 and the mean VIF is 1.18, implying that the variables are free of collinearity issues.

Table 4.2: Correlation Matrix

	RVG	ROA	ROE	BGE	BFE	BIN	HCE	SCE	SIZE
RVG	1.0000								
ROA	0.1515	1.0000							
ROE	-0.0258	0.1055	1.0000						
BGE	-0.0529	0.0384	0.2882	1.0000					
BFE	-0.0300	-0.1873	-0.0180	0.0815	1.0000				
BIN	0.0439	0.0081	-0.0792	-0.0870	-0.1185	1.0000			
HCE	0.0620	0.2187	0.1320	0.0076	-0.2379	-0.0217	1.0000		
SCE	-0.0467	-0.0681	0.4618	0.1231	0.0220	-0.0621	0.1361	1.0000	
SIZE	0.0950	0.2850	0.1228	-0.1147	-0.2404	-0.0344	0.1907	0.0229	1.0000

Table 4.3: Variance Inflation Factor

	VIF	1/VIF
ROE	1.39	0.719356
SCE	1.29	0.776129
SIZE	1.17	0.852795
BFE	1.15	0.867980
ROA	1.14	0.878790
HCE	1.13	0.882609
BGE	1.12	0.895546
BIN	1.03	0.971727
Mean VIF	1.18	

To check if the data follows a normal distribution, the Jarque-Bera and Shapiro-Wilk tests were performed. We decide to accept that the data follows a normal distribution if the p-value is more than 5%. According to table 4.4, the p-values for all the variables, including the residuals, are less than 0.05, which means none of the variables follow a normal distribution. In panel data analysis, transforming variables that are not normally distributed is often necessary to meet the assumptions underlying many statistical models, such as linear regression or generalized least squares. Non-normality can lead to biased estimates, inefficient coefficients and invalid inference due to heteroscedasticity and non-linearity. Transformations, such as logarithmic, square root or differencing, help stabilize variance, reduce the influence of outliers and approximate normality, thereby

improving the reliability and interpretability of the model results. In particular, transforming skewed financial data enhances the robustness of parameter estimates and ensures that statistical tests produce valid conclusions. According to Wooldridge (2010), transformations of variables, especially using logs or differences, are useful when the data exhibit non-normality or heteroscedasticity or when the relationship between variables is nonlinear. By implication, the variables in this study were transformed using logarithm.

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

	OBS	JARQUE-BERA				SHAPIRO-WILK			
		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
BGE	250	0.0022	0.0060	14.38	0.0008	0.96823	5.761	4.074	0.00002
BFE	250	0.0000	0.0018	28.44	0.0000	0.94232	10.461	5.462	0.00000
BIN	250	0.0598	0.0098	9.25	0.0098	0.98153	3.349	2.812	0.00246
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 amount of variation in the errors or residuals of a regression model changes depending on the value of an independent variable. In simpler terms, the spread of residuals changes as the values of the predictors change. This weakens how much we can trust statistical models in a few ways: Ordinary Least Squares estimates become less efficient; the standard errors become untrustworthy; wrong standard errors cause p-values and confidence intervals to be misleading; and the predictions might no longer show the true patterns in the data. As presented in Table 4.5, since the decision rule is to reject the hypothesis that the variance is constant when the p-value is below 5%, we conclude on the indication of significant heteroscedasticity for all variables except ROA.

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
BGE	19.12	0.0000
BFE	4.19	0.0407
BIN	26.91	0.0000
HCE	26.51	0.0000
SCE	96.44	0.0000
SIZE	13.13	0.0003
RESIDUALS	4817.00	0.0000

Given the panel nature of the data, the analysis proceeded from pooled OLS to Fixed Effects (FE) and Random Effects (RE) models to account for unobserved heterogeneity across the cross-sectional units (Baltagi, 2021). While the FE model controls for unobserved effects that may be correlated with the explanatory variables, RE assumes that the unobserved effects are uncorrelated with the regressors (Wooldridge, 2005). Both models were therefore estimated to account for individual-specific heterogeneity. The Hausman test was subsequently used to determine the more appropriate estimator between FE and RE. Furthermore, the reduction in the number of companies from 25 to 24 following logarithmic transformation resulted from one or more observations containing a zero or non-positive value. Since the logarithmic function is defined only for positive values

(Wooldridge, 2012), the zero or non-positive observation was converted to missing and subsequently excluded from the regression analysis.

Based on random effects results, SIZE is discovered to exert significantly positive influence on RVG as indicated by the coefficient and p-value of 0.115 and 0.006 respectively, implying that larger firm size is associated with higher revenue growth over the period. Moreover, BGE and BFE are significant and positive predictors of ROA as indicated by the coefficients of 0.1860 and 0.4650 and p-values of 0.066 and 0.025 respectively, suggesting that more females and financial experts on the board is associated with higher return on assets for the firms over the period. In the same vein, both BGE and BFE exert significantly positive influence on ROE as shown by the coefficients of 0.354 and 0.455 respectively and p-values of 0.002 and 0.058 respectively. This indicates that having a larger number of females and financial experts on the board of directors is associated with higher return on equity for the firms over the period.

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. Furthermore, 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. The interaction of human capital efficiency and board financial expertise (HCE*BFE) exerts significantly negative influence on ROE as shown by the coefficient and p-value of -0.0393 and 0.025 respectively. This suggests that BFE do not favourably moderate the relationship. However, a negative and significant relationship is discovered between the interaction of structural capital efficiency (SCE*BFE) and RVG as shown by the coefficient and p-value of -0.4186 and 0.055 respectively, indicating that BFE exerts no positive moderation on the relationship. Conclusively, the interaction of structural capital efficiency and board independence (SCE*BIN) exerts significantly negative influence on ROE as shown by the coefficient and p-value of -0.220 and 0.000 respectively, suggesting that board independence negatively moderate the existing positive relationship between SCE and ROE.

Table 4.7: Board Characteristics and Financial Performance

		RVG			ROA			ROE	
VARIABLE S	POLS	FE	RE	POLS	FE	RE	POLS	FE	RE
BGE	-0.0999 (0.171)	0.197 (0.300)	-0.0759 (0.179)	-0.0912 (0.110)	0.227** (0.107)	0.186* (0.101)	0.154 (0.0932)	0.467*** (0.132)	0.354*** (0.113)
BFE	-0.194 (0.398)	- 0.00854 (0.640)	-0.167 (0.415)	-0.414* (0.240)	0.564** * (0.214)	0.465** (0.207)	0.526** (0.210)	0.383 (0.267)	0.455* (0.241)
BIN	0.0866 (0.551)	0.615 (1.156)	0.151 (0.585)	-0.0213 (0.346)	-0.105 (0.433)	-0.0501 (0.397)	-0.381 (0.302)	0.279 (0.536)	-0.0182 (0.425)
HCE	0.113 (0.0839)	0.414** * (0.120)	0.208** (0.0951)	0.183*** (0.0542)	0.198** * (0.0544)	0.195** * (0.0521)	0.103** (0.0486)	0.253*** (0.0622)	0.201*** (0.0566)
SCE	0.191 (0.278)	0.316 (0.382)	0.253 (0.293)	0.629*** (0.189)	0.122 (0.156)	0.168 (0.151)	-0.195 (0.143)	-0.106 (0.170)	-0.132 (0.152)
HCE*BFE	0.0647 (0.0657)	-0.0196 (0.0984)	0.0647 (0.0657)	0.0428** * (0.0129)	- 0.00361 (0.0169)	0.0173 (0.0148)	-0.0147 (0.0152)	- 0.0623*** (0.0203)	- 0.0393** (0.0175)
SCE*BFE	-0.346* (0.179)	-0.419* (0.217)	-0.346* (0.179)	- 0.0745** (0.0363)	0.0141 (0.0369)	-0.0133 (0.0355)	-0.0211 (0.0371)	-0.0548 (0.0407)	-0.0412 (0.0380)
HCF*BIN	-0.191 (0.0515)	-0.155 (0.0515)	-0.191 (0.0515)	-0.0399 (0.0515)	0.0174 (0.0515)	- (0.0515)	-0.0515* (0.0515)	0.0127 (0.0515)	-0.0212 (0.0515)

						0.00013			
	(0.122)	(0.178)	(0.122)	(0.0246)	(0.0307)	(0.0275)	(0.0280)	(0.0377)	(0.0319)
SCE*BIN	-0.183	-0.265	-0.183	-0.0495	-0.0239	-0.0289	-0.237***	-0.209***	-0.220***
	(0.225)	(0.251)	(0.225)	(0.0460)	(0.0425)	(0.0417)	(0.0438)	(0.0449)	(0.0432)
SIZE	0.114** *	0.142	0.115***	0.0207	0.0289	0.0271	0.0381*	0.0210	0.0371
	(0.0395)	(0.0881)	(0.0421)	(0.0248)	(0.0303)	(0.0280)	(0.0212)	(0.0379)	(0.0297)
Constant	1.794	-2.601	1.319	2.492	-2.412	-2.043	0.811	-1.995	-1.022
	(3.214)	(6.050)	(3.394)	(2.041)	(2.175)	(2.049)	(1.789)	(2.712)	(2.283)
Observations	165	165	165	197	197	197	205	205	205
R-squared	0.057	0.031		0.026	0.074		0.070	0.095	
firm effect	NO	YES	YES	NO	YES	YES	NO	YES	YES
time effect	NO	NO	NO	NO	NO	NO	NO	NO	NO
F-test	2.408	1.085		1.304	3.354		3.768	4.610	
prob>F	0.0516	0.366	0.0758	0.270	0.0113	0.0403	0.00560	0.00145	0.00264
Number of Company		24	24		24	24		25	25

CONCLUSION

The results from the regression analysis show that intellectual capital, especially human capital efficiency, is still very important in affecting how well companies perform in the Nigerian financial services sector. Using the knowledge, skills and abilities of employees effectively helps a company make more money, get better returns on its assets and improve its returns on equity. This shows that companies that manage their people effectively are more likely to have better financial results. By implication, financial institutions are gaining a lasting edge in the competition by using knowledge-based resources, instead of just depending on physical assets.

The study also indicates that certain characteristics of a board can directly influence the performance of a company. The knowledge of the board members in financial issues significantly improved both return on assets and return on equity and having a board with a mix of genders positively affected profit. These results indicate that boards composed of members who possess financial expertise and come from diverse backgrounds are better able to provide effective strategic direction, manage risks more effectively and assist in making decisions that enhance the overall efficiency. In actual practice, Nigerian financial institutions such as banks, insurance companies and other financial entities operate in highly regulated and sophisticated settings where decisions involving complex financial matters require directors who possess a deep knowledge of finance and diverse perspectives. Boards that include these features are more likely to enhance governance, make more effective decisions regarding the use of capital and boost the value provided to shareholders.

Interestingly, the analysis indicates that the characteristics of a board do not consistently enhance the benefits of intellectual capital on performance. The significant negative impacts observed when board financial expertise interacts with human capital efficiency in relation to return on equity and when it interacts with structural capital efficiency in relation to revenue growth as well as when board independence interacts with structural capital efficiency in relation to return on equity suggest that some governance practices may unintentionally hinder the capacity of intellectual capital to generate value. These findings indicate that although good governance remains important, emphasizing excessive monitoring, strict adherence to rules or overly careful management of funds could hinder the capacity of managers to use their knowledge effectively. In Nigerian financial service companies, boards that primarily concentrate on adhering to rules or managing short-term financial matters may unintentionally limit their focus on innovation, embracing new technologies, employee training and investments in knowledge systems that support long-term organizational growth.

The findings therefore suggest that intellectual capital and board governance should be viewed as complementary rather than independent strategic resources. Investments in employee capability, continuous professional development, digital banking infrastructure, knowledge management systems, and organizational processes are

unlikely to produce maximum financial benefits unless they are supported by governance structures that balance effective oversight with strategic flexibility. Financial service firms that successfully combine highly efficient human capital with competent, diverse, and strategically oriented boards are likely to be better positioned to respond to technological disruption, increasing competition from fintech firms, evolving customer expectations, and changing regulatory requirements.

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