



## THE MODERATING EFFECT OF OWNERSHIP STRUCTURE ON THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL AND VALUE OF LISTED FINANCIAL SERVICE FIRMS IN NIGERIA

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### ABSTRACT

*This study examines the moderating effect of ownership structure on the relationship between intellectual capital and value (Tobin's Q) of listed financial services firms in Nigeria using a panel data of 33 sampled firms for the period of ten years (2013-2022). The data were extracted from the annual account and reports of the sample firms. Hierarchical Multiple regression technique was employed in analysing the data. Based on the analyses of the data collected, the study found that human capital efficiency (HCE) and relational capital efficiency (RCE) are positive and significant in influencing the firm value (Tobin's Q) of the sampled firms. Structural capital efficiency (SCE) is also found to be positive but insignificant to firm value (Tobin's Q). However, capital employed efficiency (CEE) is negative but significantly related to value (Tobin's Q) of the listed financial services firms in Nigeria. In addition, the results of the study also revealed that ownership structure index is positive and significantly related to value (Tobin's Q) of the listed financial services firms in Nigeria. Finally, the study discovered that ownership structure index has a moderating effect on the relationship between intellectual capital and value (Tobin's Q) of listed financial services firms in Nigeria.*

**Keywords:** IC; ownership structure; Tobin's Q; financial services firms

### INTRODUCTION

Intellectual capital (IC) and value (Tobin's Q) have gained attention from a conference on the development of financial reporting in 2011 by the International Integrated Reporting Council (IIRC) titled the Integrated Reporting ("The World Has Changed-Reporting Must Too", 2011). Integrated Reporting provides a report that fully integrates financial information and non-financial information to explain the ability of an organization to generate value and maintain it over the long term (IIRC, 2011). The statement indicates that intellectual capital has been fully recognized by the international agencies in the activity of the company for value maximization.

The existence of Integrated Reporting also requires the company to manage its intellectual capital optimally so that it can provide the best overview in terms of reporting, disclosure and value.

Optimal management of intellectual capital can increase the company's market value as investors tend to give a higher price for shares in the company that has the greater intellectual capital management (Belkaoui, 2003). Based on this phenomenon, the issue of value and intellectual capital is increasingly becoming a topic of interest for study.

However, poor performance in terms of value is usually traceable to policies and strategies formulated and implemented by managers of the entities which usually affect the wealth of shareholders. It is on this note that researchers seek to know whether policies and strategies with respect to intellectual capital can influence corporate value. Hence, organizations all over globe perceived that one of the policies and strategies needed to maximize value is the intellectual capital capability.

Thus, non-inclusion of intellectual capital in the valuation of company's net assets leads to the inaccurate determination of value of companies operating in the financial service sector (Berzkalne & Zelgalve, 2014). This problem is evidenced by the macroeconomic challenges confronting the industry in the recent past which include; instability in value, exchange rate fluctuations, high debts ratio, non-performing loans among others. Similarly, government policies and regulations such as introduction of Treasury single account (TSA) in 2015 by government also affected the value of financial institutions especially the banking sector.

Hence, the real value of the financial service firms must be explored and this will include not only the physical assets but the intangible assets. In Nigeria, the value of most companies might not be accurate as the intangible assets are not captured in valuing their net assets and this has an in tandem negative effect on the overall growth and development of organizations, financial service firms inclusive (Jinjiri et al, 2021). That is to say lack of emphasis by the Nigerian companies on intellectual capital renders their current value questionable for decision making. This may be the reason for their financial crises that led to massive sacking of staff and closure of operations experienced recently.

For these, financial service firms require reliable and sustainable policies and strategies for increasing their value (Chijioke, et al., 2017). Understanding the reliable and sustainable policies and strategies for increasing the value of the financial service firms in Nigeria is a cause for alarm. Because it raises the question of whether the traditional accounting methods used by the firms in the present information age contain relevant information needed for decision making. Hence, understanding what actually make or mar value of firms is crucial to the survival and going concern of the financial service firms in Nigeria.

Regrettably, the traditional accounting system has been in used as the basis for decision making by firms which fails to adapt to the changes in the economy, especially in knowledge-asset requirements for value deriving (Widyaningdyah, 2008). This is because the financial statements are not able to present the relevant information regarding the intangible asset that can influence corporate policy and value. Failure to report knowledge-assets by the traditional accounting can be seen from the phenomenon that occurred in some large companies such as knowledge-based Microsoft, Coca Cola and Intel, which led to significant difference between the market value and book values of their assets (Sawarjuwono & Augustine, 2003). The existence of a significant differences between their market and book values can be

concluded that the current traditional accounting method cannot be used for decision making that has to do with value maximization because it does not carry intellectual capital.

On these notes, various researches have been conducted on the intellectual capital and value but their findings are not consistent. Some studies such as Hassanudin et al, (2023), Sumiati et al, (2022), Kelvin and Shulamite (2021), Tin and Kaw (2020), revealed positive relationship between intellectual capital and value, while some studies reported negative relationship between intellectual capital and value such as; Santoso (2023), Dewi et al, (2022), Shahwan and Habib (2020), Hamdan (2018) among others. These inconsistencies in findings may not be unconnected to the gaps established by this study.

Methodologically, the inconsistencies in the results of the relationship between intellectual capital and the value of a company can be explained through a contingency approach. This approach gives the idea that the nature of the relationships that exist in the company's intellectual capital and value may be determined by the conditional factors that affect the relationship between the two variables (Bambang et al, 2015). Contingency approach allows for other variables to act as a moderating factor (Ahadiat 2008). Based on this, researchers such as (Bambang et al, 2015) examined the effect of intellectual capital and value (Tobin Q) with ownership structure as a moderating variable. These authors used managerial and institutional shareholders as proxies to ownership structure. In the same vein, Parastou, et al. (2015) takes managerial ownership as a proxy to ownership structure as a moderator in their study. Irez, et al. (2021) used family ownership as the moderating variable between intellectual capital and firm value. Veltiri and Mazotta (2016) used ownership concentration as a moderator between intellectual capital and value and yet their results yielded mixed findings. Therefore, this study will take all the components of ownership structure (Managerial ownership, institutional ownership, ownership concentration, foreign ownership, family ownership, government ownership and non-executive director's ownership) by developing an index (ownership structure index) as the moderating variable.

From the literature perspective, extant studies on intellectual capital and value have left a lot to be desired. Even though many studies have been conducted but there are specific areas that still need to be resolved due to the conflicting findings in the literature. Firstly, most of them were conducted in other countries whose regulations and corporate environment differs with that of Nigeria. There is need to conduct a local study to address our peculiarities. Few studies that were conducted in Nigeria; Jinjiri et al., (2021), Salman and Dandago (2013), Kelvin and Shulamite (2021), Emmanuel, et al. (2017), Babatunde, et al. (2014), Chijioke, et al. (2017)) failed to use ownership structure as a moderating variable. Gap is also established in the previous literature from the sample they used which render their findings inadequate for generalization. Most of them used either Banks only or insurance companies only. To have a large sample for better conclusion, this study takes the entire financial service firms in Nigeria as a study population to examine the effect of intellectual capital on Tobin Q of listed financial service firms in Nigeria: The moderating effect of ownership structure. Based on these gaps that this study seeks to fill; the study is considered inevitable.

The aim of this study is to empirically examine the moderating effect of ownership structure on the relationship between intellectual capital and Tobin Q of listed financial service firms in Nigeria. Based on the main objective of the study, the following hypotheses were formulated in a null form and tested;

*H<sub>01</sub>*: Intellectual capital (Human Capital<sub>a</sub>, Structural Capital<sub>b</sub>, relational capital<sub>c</sub> and capital employed<sub>d</sub>) has no significant impact on the Tobin Q of listed financial service firms in Nigeria.

*H<sub>02</sub>*: Ownership structure does not have significant impact on the Tobin Q of listed financial service firms of listed financial service firms in Nigeria.

*H<sub>03</sub>*: Ownership structure does not have moderating effect on the relationship between intellectual capital (Human Capital<sub>a</sub>, Structural Capital<sub>b</sub>, relational capital<sub>c</sub> and capital employed<sub>d</sub>) and the Tobin Q of listed financial service firms in Nigeria.

## Literature Review

Various literatures have been reviewed by many researchers on the impact of intellectual capital and value (Tobin Q). Therefore, this paper concentrates on reviewing the literature on the moderating effect of ownership structure on the relationship between intellectual capital and value (Tobin Q) of firms. For instance, Aziz (2023) analysed and examined the influence of intellectual capital on the financial performance of family companies with the role of the family as moderating variable. The results showed that intellectual capital is a positive and significant variable affecting the financial performance of family companies in crisis conditions and before the crisis. The role of the family, which was expected to strengthen the influence of VAIC on financial performance, turned out to be the opposite in some indicators. The study therefore recommended that intellectual capital be strengthened through effective investment.

In the same vein, Indy and Uzliawati (2023) examined the effect of managerial ownership, intellectual capital, profitability on Firm Value: Evidence in Indonesian Banking Sector. The research motivated by the phenomenon of firm value when the rupiah declined in 2018. The population of this study is Banks that listed on Indonesia Stock Exchange from 2017- 2021 and the sampling technique used was purposive sampling. The result showed that Managerial ownership and intellectual capital have no influence on firm value but the profitability had an influence to firm value.

To see the moderating effect of family ownership on IC and firm performance, Irez, et al. (2020) examined how intellectual capital efficiency affects firm performance with the moderating role of family management. The paper conducts an empirical study with different econometric models using a panel data sample of 6,132 paired firm-year observations from Spanish manufacturing SMEs in the period 2000–2013. The findings suggest that intellectual capital efficiency is a key factor that allows the firm to achieve and maintain competitive advantages, obtaining greater performance. Additionally, this research also shows that the moderating role of family management can be a double-edged sword depending on the type of intangible resources. Additionally, on the basis of the Socio-emotional Wealth perspective (SEW), this article argues that family-managed firms that focus on SEW preservation can enhance the impact of structural capital efficiency on performance.

Taken institutional ownership as a moderator, Papatungan, et al. (2020) in their study: Does institutional ownership moderate the effect of intellectual capital and company value? The study aims to empirically examine the influence of intellectual capital towards company value and also its influence while being

moderated by institutional ownership. The results of this study show that intellectual capital has a positive significant effect on company value while institutional ownership does not have a significant effect on moderating the influence of intellectual capital towards company value. The practical implication of this study is to provide information to managers or owners of public manufacturing companies and investors about the importance of intangible assets investment like intellectual capital as the competitive strategies to achieve more optimal company value, as well as for regular to make clear regulations about the disclosures of intangibles assets.

Aminiandehkordi, et al. (2015) in their study; the moderating effect of managerial ownership on the relationship between ICP and market value of companies was examined. The sample consisted of 46 companies over a period of 4 years, resulting in a total of 184 firm years. The data were extracted from Data Stream as well as annual reports obtained from the Bursa Malaysia website. Using VAIC Model, they found that managerial ownership does not moderate the relationship between intellectual capital and market value of companies. Veltri and Mazzotta (2016) investigate the Association of Board Composition, ownership structure, Intellectual Capital and Firm Performance in a High Ownership Concentration Context: Evidence from Italy. In this article they analyzed the non-financial firms listed on the Italian Stock Exchange in the period 2008-2010 from a sample of 179 firms. The findings provide evidence that the board composition, the ownership concentration and the efficiency of intellectual capital increase firm efficiency in producing profits (as measured by ROA). Furthermore, their findings add knowledge to the relationship between corporate governance and financial Performance.

Ownership structures such as institutional, managerial, foreign ownership among others can have a moderating role in the relationship between IC and firm value. Hasanudin et, al. (2023) determined the influence of intellectual capital and disclosure of corporate social responsibility on value of companies with foreign ownership structures as moderating variable. The companies used all manufacturing companies listed on the Indonesian stock exchange (IDX) in 2018-2020. Based on the analyses of the secondary data obtained, the results shows that intellectual capital negatively affect company value and CSR disclosure has a significant positive on company value, while foreign ownership structures are not able to moderate the influence on IC on CSR disclosures on company value. Foreign ownership has a weak controlling power so is not expected to moderate the relationship. The authors should have used either managerial, institutional, block holding or all. Because managers scepticism of taking risk in investing in the long-term benefit assets like intellectual capital, managers risk attitude needs to be considered as a factor.

Santoso, (2023) in this study: Does intellectual capital affect firm value with financial performance as moderating factor? a study of Indonesian food and beverage industries. This study aims to determine the effect of intellectual capital by using the MVAIC (Modified Value-Added Intellectual Coefficient) measurement model with four independent variable components namely CEE, HCE, SCE, RCE on firm value as the dependent variable by using PBV as a measure of firm value and also using EPS to describe Financial Performance as a moderating variable between the independent variable and the dependent variables. The findings showed that HCE, SCE, RCE have impact on the firm value of listed food and beverages companies in Indonesia. EPS can moderate the relationship between HCE, RCE and PBV.



Other studies use questionnaire to investigate the effect intellectual capital on company value. Suzan and Ardiansyahm (2023) examined how good corporate governance, intellectual capital and operational efficiency affect company value. This study uses questionnaire data from 15 companies listed on the IDX BUMN20 stock exchange for the period of four years (2018-2021). The analyses revealed that institutional ownership and intellectual capital significantly and beneficially affect company value. While independent commissioners, audit committees, managerial ownership and operational efficiency have no visible impact. This shows how institutional ownership is a component that can improve performance through supervision.

In the same vein, Dewi et, al. (2022) analyzed the effect of intellectual capital on firm value through financial performance. This research was conducted at National Foreign Exchange Private Commercial Banks listed on the Indonesia Stock Exchange during the observation period from 2019 to 2021 and involved ten banks using a purposive sampling method. Data were analyzed using panel data regression and path analysis. The results show that human capital efficiency has a significant negative effect on financial performance; structural capital efficiency, capital employed efficiency have a significant positive effect on financial performance; human capital efficiency, capital employed efficiency, and financial performance have a significant positive effect on firm value; structural capital efficiency has a significant negative effect on firm value; human capital efficiency and capital employed efficiency have a significant negative effect on firm value through financial performance; structural capital efficiency has a significant positive effect on firm value through financial performance.

The important role of corporate social responsibility in moderating the intellectual capital–performance has largely been neglected in the existing literature. Tran et al. (2022) extensively investigated the effects of intellectual capital on firm performance with corporate social responsibility as a moderating factor. The study finds that both independent and joint effects exist. Furthermore, the results suggest that structural capital efficiency and capital employed efficiency are the two critical components of intellectual capital affecting firm performance. Interestingly, the joint effects of intellectual capital and CSR on firm performance are also confirmed in the analysis. These findings shed light on important policy implications concerning managerial policies targeting both intellectual capital and corporate social activities to improve firm performance in Vietnam.

Some studies also investigate the effect of ownership structure on the intellectual capital performance. Meilani et. al (2021) examined the effect of ownership structure on the performance of intellectual in Indonesia. From the result of the analysis, it was found that institutional ownership and foreign ownership have a positive effect on intellectual capital performance in mining companies, while managerial ownership and government ownership do not show any effect on intellectual capital performance in mining companies in Indonesia. This research contributes to the theory and practice of companies in the conduct of business. The period of the study is only four years and intellectual capital is taken as a dependent variable instead of independent variable.

On the contrary, Salehi and Zimon (2021) evaluate the effect of intellectual capital and board characteristics on value creation and growth. Different work experiences and education were two indexes of intellectual capital, and gender diversity was the only characteristic of board members. The study

population comprises all the companies listed on the Tehran Stock Exchange during 2012-2018. Multiple regression models were employed for the analysis. The result indicates that the intellectual capital of the board members of companies does not affect companies' value and growth. The study recommended that, appointing female managers should not be dependent on firm growth and gender diversity does not affect the value creation and growth of companies listed on the Tehran Stock Exchange. Only work experience and education are taken as the measures of intellectual capital which is very weak. Also, gender diversity is not enough to represent board characteristics.

Ramires and Soto (2021) analysed the moderating role of family management on that relationship in small to medium-sized enterprises (SMEs). This paper conducts an empirical study with different econometric models using a panel data sample of 6,132 paired firm-year observations from Spanish manufacturing SMEs in the period 2000–2013. The findings suggest that intellectual capital efficiency is a key factor that allows the firm to achieve and maintain competitive advantages, obtaining greater performance. Additionally, this research also shows that the moderating role of family management can be a double-edged sword depending on the type of intangible resources. This paper may give managers an insight in how to better utilize and manage intangible resources available in their firms to improve competitive advantage and ultimately firm performance.

Intellectual capital with other factors such as capital structure, earnings per share among others can improve value. Arvila, et al. (2020) studied the effect of intellectual capital, capital structure, earning per share and profitability on stock prices with price earnings ratio as moderating variables in LQ45 companies in Indonesia stock exchange. The study aims to determine the effect of Intellectual Capital, Capital Structure, Earning Per Share, and Profitability on Stock Prices at LQ45 companies on the Indonesia Stock Exchange. In addition, this study also aims to determine whether Price earnings Ratio can be used as a moderating variable in the model.

The results of this study indicate that partially earnings per share and profitability have a positive and significant effect on stock prices. However, intellectual capital and capital structure have no significant effect on stock prices. As well as other results show that Price earnings Ratio can strengthen the Earning per Share relationship and Profitability to stock prices. However, Price earnings Ratio is not a moderating variable in the effect of intellectual capital and capital structure on stock prices in LQ45 companies on the Indonesia Stock Exchange.

In the same vein, Dwianika and Gunawan (2020) investigate SME's green entrepreneurial intellectual capital. This study aims to investigate the moderating effect of SME's green entrepreneurial intellectual capital on performance. 100 SMEs in Tangerang in several clusters were used as the sample. The results show that it is proven that green entrepreneurial intellectual capital can increase the influence of business strategies on the performance of SME's. The results of this study can be used as a reference for MSME players in determining business strategy models that adopt green entrepreneurial intellectual capital to maintain the sustainability of the business.

Still on the moderating effect of corporate governance mechanisms, Adebagyibi (2020) investigated the moderating role of corporate governance on the relationship between intellectual capital and performance

of listed non-financial companies in Nigeria. This study used ex-post facto research design and data were obtained from the sample of fifty (50) listed firms on the Nigerian Stock Exchange for a period of ten (10) years 2008-2017. For the analysis, multiple regression techniques were used. The result of the analyses revealed that both intellectual capital and corporate governance improve financial performance as the relationship is found to be significant in all components.

Hamdan, et al, (2017) examined the moderating role of corporate governance on the relationship between intellectual capital efficiency and firm's performance: evidence from Saudi Arabia. The study used a pooled data of 171 firms listed on the Saudi Stock Exchange during the period from 2012 to 2014. Multiple regression approach was incorporated under fixed-effect method. The findings revealed that the inclusion of corporate governance as a moderating variable has influenced positively the relationship between intellectual capital components and financial, operational and market performance. In addition, only capital employed efficiency positively affects financial performance, while structural capital efficiency and capital employed efficiency positively affect the operational performance. As for market performance, it was affected positively by all the Intellectual capital components.

Dadashinasab and Sofian (2014) investigate empirically the effect of intellectual capital (IC) on high IC firm financial performance with moderating role of dynamic capability (DC). The period covered is from 2000 to 2011. Secondary data were collected from financial statements of high IC firms of Malaysia (technology sector, consumer products sector, trading and service sector, and industrial products) obtained from their websites. Regression models were developed to test the relationship among firm financial performance and IC. The analysis findings indicate that, the impact of IC on firm financial performance increases when DC is included as moderator.

Noradiva, et al. (2016) examined The Effects of Managerial Ownership on the Relationship between Intellectual Capital Performance and Firm Value. This study used panel data analysis to examine the effect of managerial ownership on the relationship between ICP and firm value. Using multiple regressions, the study found that managerial ownership has no moderating effect on the relationship between intellectual capital and firm value. Specifically, human capital efficiency (HCE) component and the structural capital efficiency (SCE) component have significant positive but not for the capital employed efficiency (CEE) component.

Tseng, et al. (2015) looked in to the Contingencies of intellectual capitals and financial capital on value creation: Moderation of business cycles. The purpose of this paper is to investigate the relationship among intellectual capital (IC), financial capital (FC), firm value (V), and value creation (VC) in different business cycles (BC) for the conduct of strategic management that will maintain stable values and further increase Value. This research cites ICs as "other information" to combine ICs and the Ohlson model. Information provided by various capitals is validated by multiple regression analysis. Multi-group analysis is performed to test whether the coefficient is moderated by BC. Results indicate the significant information of ICs and FC, and the contingency perspective of BC. The value relevance of ICs is moderated by BC. Prosperity has more explanatory capacities, and recession ICs yield more incremental information.



Veltri and Mazzotta (2016) looked at the Association of Board Composition, Intellectual Capital and Firm Performance in a High Ownership Concentration Context: Evidence from Italy. This article aims to contribute to research by building and employing a sophisticated model to take into account beyond the board composition ownership structure and firm efficiency in using its intellectual capital (as measured by VAICTM). The methodology employed to verify the research hypotheses was the econometric technique of OLS regressions on pooled data (POLS), that could be used in case of non-existence of individual effects (time invariant characteristics that could be peculiar to each company), the findings provide evidence that the board composition, the ownership concentration and the efficiency of intellectual capital increases firm efficiency in producing profits (as measured by ROA). Furthermore, the findings add knowledge to the relationship between CG and FP, by confirming a positive relationship in Italy, a continental European capital market under-investigated on this issue.

Bambang, et. al. (2015) investigates; Intellectual Capital, Firm Value and Ownership Structure as Moderating Variable: Empirical Study on Banking Listed in Indonesia Stock Exchange period 2009-2012. This study aims to determine the effect of intellectual capital on firm value by ownership structure as a moderating variable. Intellectual capital is measured by using a model of Value-Added Intellectual Coefficient (VAICTM) while the value of the company is measured by using Tobin's Q. The ownership structure as a moderating variable is represented by the percentage of managerial ownership and institutional ownership. The study's population is banking companies listed in Indonesia Stock Exchange (BEI) from 2009 to 2012. Based on purposive sampling method, the sample is 27 companies. The analytical method used is multiple regression equation for overall and path analysis for testing residual moderating variables. The results indicate that intellectual capital has a positive and significant effect on firm value. This study also proves that managerial ownership is moderating variable that negatively affect the relationship of intellectual capital on firm value. While institutional ownership does not moderate the effect of intellectual capital on firm value.

## **METHODOLOGY**

The population of this study consists of all the fifty (50) financial service firms listed on the Nigerian Exchange Group (NEG) as at 31st December, 2022. The sample size of this study is 33 firms. This sample is arrived at by using judgmental sampling technique where some criteria are set in which any firm that does not meet the criteria were filtered out. The criteria are that any firm that does not have a complete data or delisted from the Nigerian exchange group for the period of the study (2013 to 2022) was filtered out.

For the purpose of this study, secondary data were extracted from the financial statements of the sampled financial service firms for the period of ten (10) years 2013 to 2022. Achieving a good result from any research requires proper analysis of data obtained. The data collected were analysed using descriptive statistics, correlation and hierarchical regression techniques.

## Variables Measurement and Models Specification

The summary of the variables and their measurements are presented on the table 3.2 below

**Table 1: Variables and their measurements**

VARIABLE	MEASUREMENT	SOURCE
Dependent variable Tobin's Q	Measured as the ratio of the market capitalization plus total debt divided by total asset of the company	(Berzkalne & Zelgalve, 2014).
Independent variables		
MVAIC	Modified Value-added intellectual coefficient	(Pulic, 2000), (Ulum et, al. 2014)
Human capital efficiency (HCE)	Measured as value added by human capital (VA/HC)	(Aziz, 2023)
structural capital efficiency (SCE)	Measured as structural capital by value added (SC/VA)	Dewi et, al. (2022)
Capital employed efficiency (CEE)	Measured as the value added over capital employed VA/CEE	(Hersugondo & Handriani, 2020)
Relational capital efficiency (RCE)	Measured as the relational capital over value added (RC/VA)	(Ulum et al. 2014)
Moderating variable		
Ownership structure (ownership structure index, OSI)	Measured as the proportion of shares held by management, institutions, block holders and foreign owners.	(Ahmed & Hadi, 2017), Millet-Reyes & Zhao 2010), Cornett <i>et al.</i> 2013)
Control variables		
Earnings Per Share (EPS)	Measured as the profit after tax/ No. of ordinary shares issued	(Veltri & Mazotta, 2016)
Firm leverage (Flev)	Measure as the proportion of total debts to total assets	Dadashinasab and Sofian (2014)
Firm age (fage)	It is measured as the difference between the year of listing and year of observation	Salehi and Zimon (2021)
Industry Dummy (IND)	Measured using dichotomy: 1 for banks, 0 for others	

**Source: Researcher's compilation, 2023**

## Models Specification

The Models of this study are presented as;

### Model 1

$$TQ_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 RCE_{it} + \beta_4 CEE_{it} + \beta_5 EPS_{it} + \beta_6 LEV_{it} + \beta_7 FAGE_{it} + \beta_8 IND_{it} + \epsilon_{it}$$

### Model 11

$$TQ_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 RCE_{it} + \beta_4 CEE_{it} + \beta_5 OSI_{it} + \beta_6 FEPS_{it} + \beta_7 LEV_{it} + \beta_8 FAGE_{it} + \beta_9 IND_{it} + \epsilon_{it}$$

### Model 111

$$TQ_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 RCE_{it} + \beta_4 CEE_{it} + \beta_5 HCE_{it}XOSI_{it} + \beta_6 SCE_{it}XOSI_{it} + \beta_7 CEE_{it}XOSI_{it} + \beta_8 RCE_{it}XOSI_{it} + \beta_9 EPS_{it} + \beta_{10} LEV_{it} + \beta_{11} IND_{it} + \epsilon_{it}$$

Where:

TQ= Tobin's q

HCE= Human capital efficiency

SCE= Structural capital efficiency

RCE= Relational capital efficiency

CEE= Capital employed efficiency

OSI= Ownership structure index

EPS= Earnings per share

LEV= Leverage

IND = Industry dummy

$\beta_1 - \beta_{11}$  are the coefficients of the parameter estimates.

it: panel data

$\epsilon$ : the error term.

**RESULT AND DISCUSSIONS**

**Table 2: Regression Results (MODEL 1) Direct Relationship**

VAR.	Coeff.	Z-Stat.	P-Sig	R-Square	Wald Chi.	P-Sig
Const.	0.2798	5.76	0.000	0.4415	492.06	0.000
HCE	0.0155	2.80	0.005			
SCE	0.0224	0.53	0.596			
RCE	0.5714	0.95	0.003			
CEE	-0.6933	-7.96	0.000			
EPS	0.0634	4.69	0.000			
FLEV	0.4495	3.51	0.000			
FAGE	-0.0042	-11.75	0.000			
IND	0.1351	6.08	0.000			

Source: STATA 14.0 Output based on the data generated (2013-2022), Note: HCE= Human capital efficiency, SCE= Structural capital efficiency, RCE=Relational capital efficiency, CEE= Capital employed efficiency, EPS= Earnings per share, FLEV= Firm leverage, FAGE= Firm age, IND= Industry dummy

The cumulative R<sup>2</sup> of 0.4415 which is the multiple coefficients of determination gave the proportion of the total variation in the dependent variable (TQ) as explained by the independent variables jointly. Hence, it signifies that 44.15% of the total variation of listed financial service firms in Nigeria is accounted for by the proportion of Human capital efficiency, structural capital efficiency, relational capital efficiency, capital employed efficiency, earnings per share, firm leverage, firm age and industry dummy.

The Wald chi which represents the Fisher Exact test recorded a value of 492.06 with p-value of 0.000 which is significant at one percent respectively. This indicates that intellectual capital and firm value model is fit. It further implies that for any changes in intellectual capital of the listed financial services firms in Nigeria; their value will be affected directly. The P-value of Wald chi which is significant at a level of 0.0000 (1%) implies that there is 99.9 percent probability that the relationship between the variables were not due to mere chance. As such, the results from the regressions can be relied upon. In addition, it implies that the independent variables reliably predict the dependent variables of the study.

From table 2, it can be observed that the coefficient value for human capital efficiency (HCE) is 0.0155, Z-values was 2.80 with significant p-value of 0.005 at 1% level of significance. This signifies that human capital efficiency has a positive and significant effect on firm value (TQ) of listed financial services firms in Nigeria. This implies that for every one Naira increase in the human capital development, value of the listed financial services firms increases by 0.16%. This may be as a result of the fact that, when the amount spent on employee wages, skills and welfare increases, they will be motivated and put their best to work hard, as such, productivity and quality will improve thereby increase the value of the firms. Based on this, the study therefore rejects the null hypothesis (H0<sub>1a</sub>) which state that human capital efficiency has no significant effect on value of listed financial services firms in Nigeria.

The table 2 also revealed that structural capital efficiency has a coefficient value of 0.0224, z-values of 0.53, and p-value of 0.596 which is not significant. The coefficient value of 0.0224 indicates that structural capital efficiency has positive impact on the value of listed financial service firms in Nigeria which implies that any increase in structural capital efficiency will lead to an increase in the value of the firms to the tune of 2.24%. This may due to the fact that, the amount spent on copy right, innovation, trade mark, process and methods, organizational culture, routines, procedures, technologies, software, databases, patents have a multiplier effect in increasing the overall profitability and value of the firms. Therefore, the null hypothesis which states that structural capital efficiency has no significant impact on the value of listed financial service firms in Nigeria has been rejected.

As can be seen from the table 2, relational capital efficiency had a coefficient value of 0.5714, Z-value of 2.95 with P-value of 0.003 which is significant at 1%. The positive coefficients implies that relational capital efficiency and value of listed financial service firms in Nigeria are directly related which suggest that as the firms increase its expenditure on selling, marketing and distribution, their value will increase to the tune of 57%. This result provides evidence of rejecting the null hypothesis which states that relational capital efficiency has no significant effect on value of listed financial service firms in Nigeria.

Equally on the table 2, the coefficient value, z-value and p-value of capital employed efficiency are - 0.6933, -7.96 and 0.000. The negative coefficients of -0.6933 signifies that capital employed efficiency and value of listed financial service firms in Nigeria are indirectly related which means that an increase in capital employed efficiency will cause a significant decrease in value of the financial service firms in Nigeria by the coefficient value (69%). The study therefore, reject the null hypothesis which states that capital employed efficiency has no significant impact on value of listed financial service firms in Nigeria.

**Table 3: Regression Results (MODEL II)**

VAR.	Coeff.	Z-Stat.	P-Sig	R-Square	Wald Chi.	P-Sig
Const.	0.2946	7.57	0.000	0.3792	425.69	0.000
OSI	0.0941	7.54	0.000			
EPS	0.0817	5.56	0.000			
FLEV	0.5455	4.87	0.000			
FAGE	0.0037	-6.69	0.000			
IND	0.1442	6.86	0.000			

*rce: STATA 14.0 Output based on the data generated (2013-2022). Note: OSI= Ownership structure index, EPS= Earnings per share, FLEV= Firm leverage, FAGE= Firm age, IND= Industry dummy*

This subsection examined the effect of the moderating variable (ownership structure index) on the value of listed financial service firms in Nigeria. Hence, the table 3 above shows that ownership structure index (OSI) has a coefficient value of 0.0941, Z-value of 7.54 and p-value of 0.000. This result suggests that the relationship between ownership structure index and value of listed financial service firms in Nigeria is positive and significant which implies that as the number of shares held by management, institutions, foreigners, block holders among others increase, the value of listed financial service firms will also increase significantly in the same direction. This finding provide evidence that ownership structure can



conveniently moderate the relationship between intellectual capital and value of listed financial service firms in Nigeria. The study therefore rejects the null hypothesis two which states that ownership structure has no significant effect on the value of listed financial service firms in Nigeria.

**Table 4: Regression Results (MODEL 111) indirect relationship**

VAR.	Coeff.	Z-Stat.	P-Sig	R-Square	Wald chi.	P-Sig
Const.	0.2798	5.76	0.000			
HCEOSI	-0.0250	-1.71	0.088	0.5092	778.93	0.000
SCEOSI	0.2875	2.06	0.039			
RCEOSI	-0.3943	-1.40	0.161			
CEEOSI	0.2880	1.75	0.080			
EPS	0.0634	4.69	0.000			
FLEV	0.4495	3.51	0.000			
FAGE	-0.0042	-11.75	0.000			
IND	0.1351	6.08	0.000			

Source: STATA 14.0 Output based on the data generated (2013-2022). Note: HCE= Human capital efficiency, SCE= Structural capital efficiency, RCE=Relational capital efficiency, CEE= Capital employed efficiency, OSI= Ownership structure index, EPS=Earnings per share, FLEV= Firm leverage, FAGE=Firm age, IND= Industry dummy

Based on the result obtained from table 4 above, the moderator (Ownership structure index) has weakened the relationship between Human capital efficiency, relational capital efficiency and capital employed efficiency with firm value (Tobin Q) based on their P-values. However, the moderator has strengthened the relationship between structural capital efficiency and Tobin Q of the listed financial service firms in Nigeria. Based on this result, it can be said that ownership structure index moderates the relationship between intellectual capital and firm value (TQ) of listed financial service firms in Nigeria. The study therefore rejects the null hypothesis three of the study which states that ownership structure has no moderating effect on the relationship between intellectual capital and Tobin Q of listed financial service firms in Nigeria.

To further substantiate the findings of this study that ownership structure has the moderating power between intellectual capital and value, R-square and Wald-chi of the unmoderated model and the moderating model were compared. From the unmoderated model, the R-square and Wald chi are 0.4415 and 492.06 which have increased to 0.5092 and 778.93 respectively. This further affirmed the findings that ownership structure index has a moderating power on the relationship between intellectual capital and value of listed financial service firms in Nigeria.

### Conclusion and Recommendations

Based on the findings of the study, we conclude that intellectual capital is a factor that can improve the value (Tobin Q) of listed financial services firms in Nigeria and that ownership structure is a moderating factor on the relationship between intellectual capital and Tobin Q. The study therefore recommended that the board of listed financial services firms in Nigeria should strengthen its intellectual capital efficiency by investing more on human capital development through training and motivation. The board should

enhance structural capital through investing on software, trademarks, research and development among others and also pay maximum attention on efficiency of relational capital through spending more on marketing and improving relationship with outsiders. The board and regulators should mandate the inclusion of intellectual capital in assets valuation and capitalization. Finally, the board and policy makers should increase the number of shares held by management, institutions, foreign owners, block holders so as to effectively monitor and control management in order to improve investment on intellectual capital.

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