Effects of Intellectual Capital Cost on Performance of Selected deposit Money Banks Quoted in Nigeria

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***Abstract*: The lack of consensus in reporting on the impact of intellectual capital cost on overall organizational value necessitated the current study. The purpose of this research paper is to explore the effect of intellectual capital (IC) and its various components on the financial and market performance of Nigerian Deposit Money Banks (DMBs). Data for the study were extracted from the audited financial statements of Deposit Money Banks (DMBs) listed on the Nigerian Exchange over a ten-year period (2011-2020) as at 31st December 2020, and independent variables derived from Public's (2000) Modified Value-Added Intellectual Capital Adequacy Ratio (MVAICAR) components were regressed against dependent bank performance metrics (Return on Assets (ROA) and Market to Book value of equity proxy by Tobin's Q (TQ). Expo facto design was employed and the multiple regression technique was used to determine the existence of relationship between the variables. Human Capital Adequacy Ratio (HCAR), Relational Capital Adequacy (RCAR), and Capital Employed Adequacy Ratio (CEAR) were all positively and significantly related to ROA (P=0.000,0.000,0.0400 =0.003,0.439,0.067 at 5 percent significant level), whereas Structural Capital Adequacy Ratio (SCAR) was positively related but insignificant (P=0.130 =0.011at 5 percent). HCAR and RCAR, on the other hand, were favorably and considerably associated to Tobin's Q (P=0.001,0.0.009=5.03,3.31 at 5 percent significance level), whereas CEAR and SCAR were positive but negligible (P=0.972,0.644=0.04,0.48 at 5 percent significance level). The findings from the study revealed that investing in overall intellectual capital components have a positive and significant effect on the financial and market performance of Nigerian Deposit Money Banks and recommend that regulators should incorporate Intellectual Capital investment as part of the framework for improving and reinforcing banks reporting system on performance and value.**

***Key Words*: Capital Employed Adequacy Ratio, Intellectual Capital Components, Relational Capital Adequacy Ratio, Tobin's Qand Structural Capital Adequacy Ratio.**

I.BACKGROUND TO THE STUDY

In today's dynamic business environment, especially in the banking industry, where knowledge and information are critical to their very existence and survival, intellectual capital is gradually assuming the characteristic of a "product," thereby increasing the awareness that a company's stock to intangible assets ratio is a critical factor in its ability to sustain a competitive advantage John-Akamelu and Iyidiobi(2018). According to Oyeakwelu and Okoh (2020), knowledge-based intangible assets in particular are recognized as critical to the wealth creation process and have evolved into the primary competitive differentiator for organizations in virtually all industries, particularly service-based firms. Subsequently, the OECD (2000) as cited by Oyeakwelu and Okoh (2020) explains the increased prominence of intellectual capital (IC) as a business and research topic. Few knowledge-intensive businesses combine direct client contact with talent management like banks (Anifowose, Abdul-Rashid, & Annuar, 2017). Buallay(2019) asserted that intellectual capital is now more than ever a critical strategic asset for banks and there is a new knowledge-intensive paradigm shift in the banking industry empowered by financial Technology (fintech).Banks are therefore investing in intangible assets like human capital to stay competitive (Nawaz and Haniffa, 2017).

The lack of attention to reporting on intellectual capital associated with the traditional banking sector has hindered the optimization of human and relational capital resources thereby reducing the success of firms in the developing economies (Patrick, 2016; Kannya 2018). Buallay(2017) asserted that financial institutions have found solace in intellectual capital as a means of achieving long-term, profitable success"

Given the banking sector's customer-centric nature, the emergence of the intellectual capital discourse, and the drive to develop new metrics for recording and reporting value, traditional accounting practices must grasp the significance of intellectual capital in the value creation process (Sukhdev et al 2016).

1.1 Statement of the Problem

Recently, the COVID-19 pandemic has underscored the critical link between intellectual capital and a firm's financial success (Arcelor 2020).As such, shareholders and government regulators are counting on corporate directors to accomplish stated goals along with increased board governance by beefing up their investment in Intellectual Capital. According to the World Bank ECA Economic Summit (2020) "companies with entrenched intellectual capital governance modules are considered better investments, capable of creating more long-term changes that improve overall performance."

Clearly, few scholars have examined the effect of intellectual capital on organizational performance in Nigeria's banking sector to date. The issue that businesses, users of accounting information, standard setters, and regulators must address is the best way to comprehend and communicate how firms value is created in relationto market prices for its shares, and its accounting book value (Pourkiani, Sheikhy&Daroneh 2014).

Furthermore, the lack of recognition of Intellectual capital in the financial statement remains a classical debate.Bontis and Lev (2001) contended that if corporate Intellectual Capital, which is not recognized in financial statements as an asset, did not exist, stock prices would not respond to events such as management and board composition changes.

Also, by employing the components of Pulic's (2000) Modified Value-Added Intellectual Capital Adequacy Ratio (MVAICAR) model, this research offers guidance to bank executives looking to include Intellectual Capital into their decision-making modules particularly in Nigeria," (Kilic & Kuzey, 2016).

Finally, most of the studies on Intellectual capital utilised ROA and ROE as the measure of financial performance, while this study includes market performance measure and extends the study to cover recent period up to 2020 in other to improve the reliability of the result.

As demonstrated by the preceding submissions, the task of establishing a relationship between Intellectual Capital and Corporate valuation remains incomplete. This study is critical because there is a glaring gap in the literature regarding the impact of IC components on corporate valuation in developing countries. The study therefore seeks to empirically examine the import of intellectual capital on firms' financial and market performance.

1.2 Objectives of the Study

The fundamental purpose of this study is to investigate the relationship between intellectual capital and the financial and market performance of banks. Among the specific objectives are:

i. to assess the influence of Intellectual capital components on the Return on Assets (ROA) of selected Deposit Money Banks quoted in Nigeria
ii. to investigate the impact of Intellectual capital components on market performance of selected Deposit Money Banks quoted in Nigeria

1.3 Research Questions

The following research questions emanated from the above stated objectives**.**

i. how doesIntellectual Capital components influence the Return on Asset (ROA) of selected Deposit Money Banks quoted in Nigeria**?**
ii. in what ways doesIntellectual Capital components influence the market performance of selected Deposit Money Banks quoted in Nigeria**?**

1.4 Research Hypotheses

Hypotheses tested

H_{01}: Intellectual Capital components does not significantly influence the Return on Assets (ROA)of selected Deposit Money Banks quoted in Nigeria

H_{02} : Intellectual Capital components has no substantial effect on the market performanceof selected Deposit Money Banks quoted in Nigeria

1.5 Significance of the Study

The study's conclusions are important for the economic and effective decision-making of a wide variety of diverse stakeholders in the banking sector, including employees, present and potential investors, company boards of directors, and other stakeholders, as well as the government.

1.6 Scope of the Study

This study investigates the nexus between intellectual capital components and market and financial performance of Deposit Money Banks (DMBs) quoted on the Nigerian Exchange employing Pulic's (2000) Modified Value-Added Intellectual Capital Adequacy Ratio (MVAICAR). The study's data were extracted from ten (9) of the first tier and second tier Deposit Money Banks which includes (First Bank, United Bank of Africa, Guaranty Trust Bank, Access Bank Zenith Bank as well as Ecobank, First City Monument Bank ,Fidelity bank, Stanbic IBTC bank and Sterling Bank) over a ten-year period (2011-2020) as most of the banks have complete financials as well as market value information on yahoo finance for this time frame.

II. LITERATURE REVIEW

This section highlights the Conceptual, Theoretical, Empirical and Conceptual Framework.

2.1 Concepts Reviewed

2.1.1 Intellectual Capital Component

According to Preston and Ngah (2012), intellectual capital is the economic value of an organization's intangible assets, which include human, organizational, and physical wealth that provides a competitive edge. The board of directors' talents, capabilities, experience, as well as heterogeneity all contribute directly to the most efficient use of these resources (Shettima & Dzolkarnaini, 2018).

Sofie (1999) defined Intellectual Capital as the existence of information, technical competence, customer interactions, organizational technology, and professional competencies that provide a corporation with a competitive advantage in its industry.

Nadeem et al. (2017) on the other hand, described intellectual resources as capital inputs that help enterprises to strengthen their competitive position, growth, and sustainability, particularly in a knowledge-transitioning economy. This is due to their proclivity for strategic decision-making on the development, exploitation, and management of intellectual resources (Nadeem et al. 2017).

Since intellectual capital is intangible in application, it is regarded as a veiled but important source of economic growth for businesses (Anifowose et al., 2017; Isola et al., 2017). This is due to the fact that human capital encompasses a firm 's human, structural, and relational assets, and the effective

exploitation of each of these assets has a variety of positive impacts on performance (Chiucchi et al., 2018).

Pulic (2000) suggest that intellectual capital can be divided into three (3) components: human, structural, and relational or consumer capital.

2.1.2 Human Capital

The primary goal of human intangible resources is the need to generate new services and products, as well as to innovate corporate processes aimed at profit making. Rehman et al. (2011) described human capital as an entity's skill and intelligence that can be further developed by vigorous investment training programs. Simply said, human capital refers to employees' experience and competence.

2.1.3 Structural Capital

It encompasses corporate culture, communication processes, enterprise resource planning, computer technology, knowledge transfer, as well as product and process innovation. In other words, it is employee-created assets and systems held by the firm (Akpinar & Akdemir, 1999).

2.1.4 Relational Capital

Akpinar and Akdemir (1999) defines Relational capital as "organization's relationships or network of associates, as well as their happiness with and commitment to the company."

This includes customer interactions, supplier relations, public relations, and relationships with investors, owners, and partners.

2.1.5 Financial Performance

Financial performance of a business is derived from the totality of its operational and market performance, which is a culmination of all corporate efforts. It is a barometer for measuring a company's overall health. It is the most often used gauge of organizational performance because financial outcomes typically represent the advantages of organizational actions (Chang & Lee) (2012). Katchova and Enlow (2013) define financial success as Return on Assets (ROA), Return on Proprietary Equity (ROPE), Return on Investment (ROI), Profit Margin, and Earnings Per Share. The most common being Return on Assets (ROA) and Return on Proprietary Equity (ROPE).

2.1.6 Return onAssets (ROA)

This is one of the profitability ratios. It is a measure of a company's earnings compared to its investment in assets. It assesses a company's earning capacity using available asset. It indicates whether a company's assets are being underutilized or overutilized. As a result, it is a measure of operational performance. It is significant since it demonstrates a company's ability to generate money. It is determined by dividing operating profit by total assets. Return on Assets (ROA)measures a company's profitability in relation to its total assets. The metric informs management or an investor about how efficient a company's management is using assets to generate earnings.

2.1.7 Financial Leverage

Leverage is defined as the relationship between total debts and total assets. A company can acquire fund to finance its operations through equity, debts, and leases. Financial leverage is the use of borrowed monies as a funding source when a company is investing to expand its asset base and create returns on risk capital.It therefore the utilization of borrowed funds to acquire assets that are expected to generate higher gain compared to the cost of borrowing. Firms with only equity are regarded as unlevered firms while those that utilizes both equity and debt are levered (or leveraged) companies.

2.1.8 Market to Book Value Ratio (Tobin's Q)

The main strategicaim of an organization is to increase the wealth of its shareholders (Ross, Westerfield & Jordan, 2008). Wealth can be established by dispersing surplus earnings to shareholders, and, more crucially, by capital gains on investments (Ross et al, 2008). The market value of a stock is the price at which it may be sold on the stock market, whereas the book value of a firm is the cash value of the company after deducting its equity.It is expressed as the relationship between the market valueand the book value of the firm (Ross et al, 2008).

Some prior studies that have used this indicator are Putra and Ratnadi (2021); Weqar*et al* (2021); Soewarno and Tjahjadi (2020); Xu and Liu (2020); Fengli and Jian (2020); Subagyo and Waluyo (2020); Chowdhury, Rana, and Azim (2019); Nadeem, Gan, and Nguyen (2019); and (Dzenopoljac, Yaacoub & Elkanj, 2017).

2.2 Theoretical Review

There are avalanche of theories that backs the study of intellectual capital and firms' performance. The Resource Base Theory, serves as the foundation for this investigation.

2.2.1 The Stakeholder Theory

Freeman first propounded the theory in 1983 stating that corporations have evolved to a corporate system with many groups with differing interests in it. The groups are collectively called "stakeholders" and shareholders are just a part. Stakeholders can also be defined as those individuals or entities who are critical to a corporation's survival or success, as well as those who are impacted by the operations of the corporate system. The typical stakeholders who are the owners, employees, customers, suppliers, management, and local community has reciprocal rights, duties as well as benefits. The firm is part of the society, and it draws its workforce from there. There is thus a social responsibility to disclose the acquisition, utilization, and valuation of the human capital (Shamsudin&Yian, 2013). This theory is related to this study as it encourages voluntary disclosure of more information on human capital, which is an independent variable.

2.2.2 The Signalling Theory

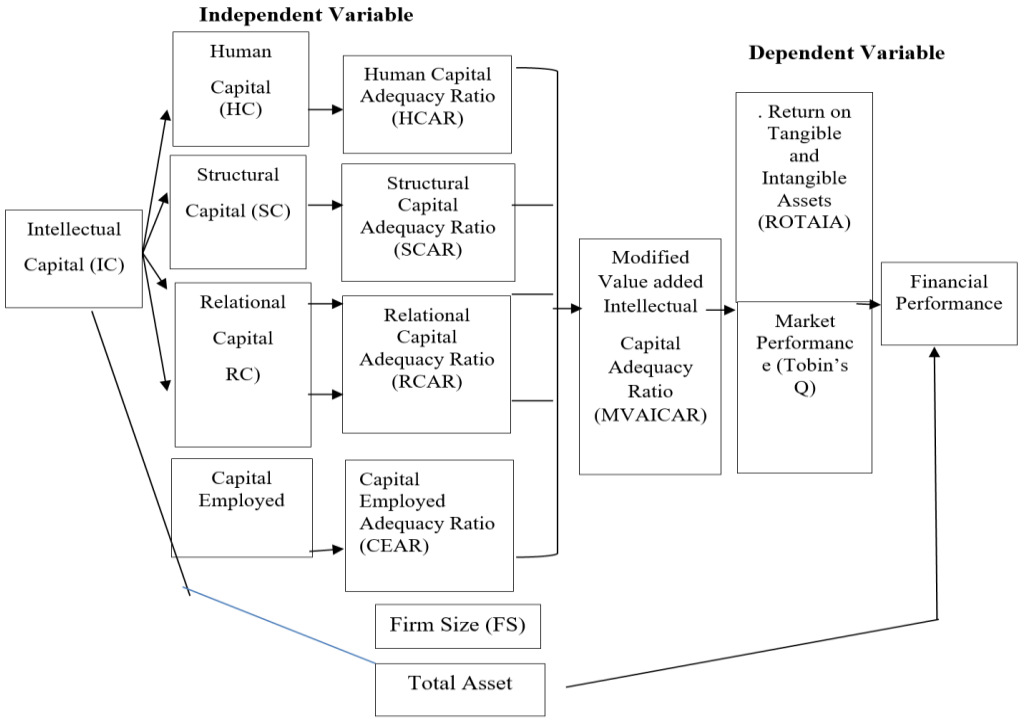
The signalling theory is one of Spence's most recent voluntary disclosure theories propounded in (1973). The objective of this theory is to reduce the imbalance of knowledge between two parties (Spence, 2002). Spence's (1973) investigation on labor markets confirmed that employers and applicants are unaware of one another's worth. As a result, job seekers engage in activities or behaviors that mitigate this information asymmetry and portray them as employable. Such behaviors may be demonstrated through the possession of advanced degrees, professional certificates, or even the ranking of colleges attended.

Similarly, corporations may high-priced consultants during the recruitment process to represent (signal) that they are a high-quality organization.

The signaling theory notion has been extended to account for voluntary disclosure in corporate reporting (Ross, 1977). Voluntary disclosure is "a signaling mechanism for businesses to release more information than is needed by law or regulation in order to demonstrate their superiority" (Campbell et al., 2001).

This theory is appropriate to this study since it targets the decrease of information asymmetry in the measurement and disclosure of intellectual capital. On intellectual capital assets (as independent variable in this study), there is an information asymmetry that might be decreased through signalling. As a result, high-quality businesses are expected to provide additional information about intangible assets, such as intellectual capital.

2.4 Conceptual Framework



Compiled By Researcher (2022)

2.2.3 Resource Based Theory

Wernerfelt (1984) established the resource-based theory of the firm: "The resource-based (RB) theory is widely regarded as the pioneer theory on the relevance of intangible assets with respect to the success of the firm." (Barney, 1991). According to resource-based theory, "Resources that are valuable, scarce, and difficult to mimic, best position a firm for long-term success." These strategic assets serve as a foundation for the long-term development of business skills that result in higher performance.

This idea views a firm as a collection of interdependent tangible and intangible resources, and believes that the internal sources of a corporation's sustainable competitive advantage must be exploited (Kraaijenbrink, Spender, & Groen, 2014). As a result, the performance of tangible assets is contingent upon the performance of intangible assets and vice versa. According to this hypothesis, IC adds greatly to a firm's financial performance regardless of its geographic location. This reasoning is compatible with Zéghal and Maaloul (2010), who claimed that "firms can generate additional returns and gain a competitive edge through the effective use of their strategic resources, such as IC assets."

The idea is relevant to our study because it highlights intellectual human capital as a resource capable of providing a corporation with a strategic competitive advantage in exchange for greater performance.

2.5 Empirical Review

2.5.1 Intellectual Capital and Organisational Performance (ROA)

A plethora of studies addressing the impact of various makeups of IC on the financial and market success of firms abound in literature (Hamdan, 2018). However, majority of the time, the judgments gained are inconsistent in their outcomes and conclusions

Al-musali and ku Ismail (2014) examined the impact of IC on Saudi banks' performance during a three-year period, from 2008 to 2010, and discovered a very small but positive effect on ROA and ROE . According to a related study conducted by Razak et al. (2016), it was revealed that Saudi banks had a higher level of human capital efficiency compared to the quantum of structural and relationship capital efficiency (RCE)

Rehman, Aslam, and Iqbal (2021) concluded that investing in IC drives performance in Islamic banking. Similarly, a Vietnamese study of financial and nonfinancial enterprises revealed that IC improves financial performance of the financial sector but has no influence on the success of non-financial firms' performance (Zhang, Duc, Mutuc& Tsai 2021).In a similar study of non-financial companies quoted in Nigeria Adegbayibi (2021) concluded that intellectual capital has positive significant effect on financial performance metrics. Sardo and Serraqueiro (2018) examined the effect of intellectual capital (IC) on growth potential of financial performance of 14 European countries and concluded that IC efficiency has a favorable effect on the financial performance.

Onyekwelu, Okoh, and Iyidiobi (2017) investigated the effect of intellectual capital on financial performance of Nigerian banking industry and found a positive significant relationship between IC and financial performances of banks. Apiti, Ugwoke, and Chikezie (2017) in a similar study used four (4) selected listed food and beverage companies on the NSE in their study and showed a significant relationship between intellectual capital and firm's financial performance.

In contradiction to the aforementioned, another study on the Bahrain banking industry discovered that Human Capital Efficiency(HCE) and Relational Capital Efficiency (RCE) are positively correlated with financial performance of Bahraini banks, however there is no such correlation between Structural Capital Efficiency(SCE) and financial performance. Kasoga (2020) examined the effect of intellectual capital on firm's performance within the service and manufacturing sectors listed in Tanzania Dar es Salam Stock Exchange (DSE) and concluded that human capital efficiency and capital employed efficiency were negative which suggests poor investment in human skills and capital of the firms. A similar conclusion was reached by Ibrahimy and Rehman (2019) in their study of companies listed in Bursa Malaysia that structural capital efficiency and capital employed efficiency contributed to performance but human capital efficiency shows a negatively weak relationship.Oyedokun and Saidu (2018) examined the impact of intellectual capital on the financial performance of listed oil and marketing companies in Nigeria. The analysis indicated that market to book value has a negative significant impact on Return on Asset (ROA).

2.5.2 Intellectual Capital and Organisational Performance (Market to Book Ratio)

Several earlier studies that used market-to-book as a proxy for shareholder performance and examined the relationship with intellectual capital are summarized below:

Nubia, Okolo, Ndu and Nwokeji (2019) investigated the effect of intellectual capital on performance of non-financial firms in Nigeria and concluded "that capital employed efficiency, human capital efficiency and structural capital efficiency has positive significant effect on earnings per share and market to book value (performance)".

In an empirical study on ASEAN countries, Nimtrakoon (2015) established a positive correlation among SC and market value, indicating that enterprises with a higher IC have a higher market value. Yilmaz and Acar (2018) examined IC on market and non-market performance of production companies listed in Borsa Istanbul100 Index and concluded that relational capital influence market performance and models explaining financial performance give more accurate results than market performance models. Anifowose and Ibrahim (2018) also analysed the relationship between intellectual capital and corporate value of listed firms in Nigeria and concluded on a positive relationship between overall ICE and corporate book value (cash flow from operation and EVA). Vitalis (2018) work on listed companies in Nigeria similarly concluded that IC significantly affects market-to-book ratio.

However, Chowdhury et al. (2019) in a study of Turkish manufacturing firms found that IC did not determine the extent of market-to-book value or investment decisions, and that a higher VAIC ranking does not always imply greater market capitalisation. In a similar study, Bayraktaroghu(2019), SCE was seen to be the sole negative and significant predictor of Market to Book ratio. Finally, Oyedokun and Saidu (2018) evaluated the influence of intellectual capital on the financial performance of publicly traded oil and marketing companies in Nigeria and concluded that "market to book value has a considerable negative effect on return on asset."

III. RESEARCH METHOD

The study investigates the impact of intellectual capital, both in its aggregate and constituent parts on the financial and market performance of Deposit Money Banks (DMBs) registered on the Nigerian Exchange (NSE)as the end of August 2020. The study used an expo facto design and analysed the data using multiple linear regression. The study's population includes all the 15 first tier money deposit banks listed on the Nigerian Exchange**,**out of which a sample of (9)

banks were purposively selected based on data collected for a period ten (10) years from (2011-2020)The sampling technique was chosen based on certain criteria such as (1) Listing on the Nigerian stock exchange (2)Availability of Published and complete annual report as well as (3) the availability of its share price/capitalization on Yahoo Finance during the period 2011-2020.

3.1 Study Variables and Measurement

The modified value-added intellectual capital adequacy ratio (MVAICAR) developed by Pulic (2000) was used in this study to assess the association between intellectual capital and bank financial and market performance. MVAIC components are used to measure the independent variables: Human Capital Adequacy Ratio (HCAR), Structural Capital Adequacy Ratio (SCAR), Relational Capital Adequacy Ratio (RCAR), and Capital Employed Adequacy Ratio (CEAR), while the dependent variables (bank performance) were assessed using the Operational Performance Indicator (ROA) and the Market Performance Indicator (MPI) (TOBINS Q).

Furthermore, company size as measured by Total Asset (TA) was employed as a control variable.

Variables	Code	Measure
Dependent Variables		
Operational Perf.	ROA	$\frac{Net\_Income}{Total\_Asset}$
Market Performance	TQ	$\frac{Book\_Value\_of\_Equity}{Book\_Value\_of\_Total\_Asset}$
Independent Variable		
Human Capital Adequacy Ratio	HCAR	The costs invested on employees $HCE = \frac{Value\_Added}{Employee\_Cost}$ $Value\_Added = EBIT + DEPR + EMPLOYEE\_COST$
Structural Capital Adequacy Ratio	SCAR	$SCE = \frac{Structural\_Capital}{Value\_Added}$ $Structural\_Capital = Value\_Added - Employee\_Cost$
Capital Employed Adequacy Ratio	CEAR	$CEE = \frac{VA}{CE}$ $CE = Capital\_employed = Equity + Debt$ $VA = Value\_Added$
Relational Capital Adequacy Ratio	RCAR	$Relational\_cost = Marketing + promotional\_cost$ $RCE = \frac{Value\_Added}{Relational\_cost}$
Modified Value-Added Intellectual Capital Adequacy Ratio	MVAICAR	MVAICAR = HCAR+SCAR + CEAR+ RCAR
Total Assets	TA	the degree to which a bank uses fixed-income securities

3.2 Model Specification:

Bank Performance = f(MVAICAR)

Bank Performance = f(HCAR, SCAR, CEAR, RCAR)

$$ROA_{it} = HCE_1\beta_{it} + CEE_2\beta_{it} + SCE_3\beta_{it} + RCE_4\beta_{it} + FS_5\beta_{it} + \varepsilon_{it}$$

$$TQ_{it} = HCE_1\beta_{it} + CEE_2\beta_{it} + SCE_3\beta_{it} + RCE_4\beta_{it} + FS_5\beta_{it} + \varepsilon_{it}$$

$Where$:
$HCE = Human\_Capital\_Efficiency$
$CEE = Capital\_Employed\_Efficiency$
$SCE = Structural\_Capital\_Efficiency$
$RCE = Re\,l\,ational\_Capital\_Efficiency$
$FS = Firm\_Size$
$\varepsilon = Error\_Term$
$i = Firms$
$t = Time$
$\beta = Coefficient$
$it = Panel\_Nature$
ROA = Return Asset

TQ =Tobins Q

IV. DATA ANALYSIS AND INTERPRETATION RESULT AND DISCUSSION

Table 1. Descriptive statistic

variables	Mean	Std dev	min	max
ROA	.023	.017	-.02	.066
TQ	.37	.144	0.082	0.988
HCAR	2.71	1.684	.005	8.10
SCAR	0.534	0.697	-4.86	2.73
CEAR	.04	.018	.001	.089
RCAR	28.09	17.33	2.48	80.91
FS	9.29	.369	8.34	9.94

Researchers Computation 2021

Table 1 reveals the description on the variables of study. The dependent variable ROA has a mean value of .023 and a standard deviation of .016 with a maximum and a minimum value of -0.02 and 0.066 respectively. Also, the table shows that TQ(MV/BV) has a mean of .371 and a standard deviation of 0.144. The standard deviation on all the dependent variables shows that they are widely dispersed except for To ROA. Suggesting the firms has common pattern in the ROTAIA.

Further, the table reveals that Human Capital Adequacy Ratio (HCAR) has a mean value of 2.71 and standard deviation of 1.684. SCAR has mean value of 0.534 and Standard deviation of 0.69, also, Capital Employed Adequacy Ratio(CEAR) has a mean value of 0.04 and a standard deviation of 0.019 and RCAR has an average value of 28.09 and a standard deviation of 17.33. The table also shows that the firm's size has an average value of 9.28.

Table 2: Correlation Analysis

Variables	ROA	TQ	HCAR	SCAR	CEAR	RCAR	FS
ROA	1.00						
TBQ	0.241	1.00					
HCAR	0.842	0.270	1.00				
SCAR	0.589	0.071	0.481	1.00			
CEAR	0.839	0.227	0.676	0.349	1.00		
RCAR	0.162	0.101	0.085	0.057	0.148	1.00	
FS	0.429	-0.186	0.417	0.417	0.203	0.10	1.00

Researchers Computation 2022

Table 2 Reveals that Human Capital Adequacy Ratio (HCAR) has apositive correlation with ROAand TQ with avalue of 0.841 and 0.30. However, the ROAhas the highest correlation

Further, Structural Capital Adequacy Ratio (SCAR) has a positive correlation with the firm overall performance measures: ROAand TQ with a value of 0.589 and 0.07. however, the ROA has a strong correlation.

In addition, table 2 shows that Capital Employed Adequacy Ratio (CEAR) has a positive correlation with the firm performance measures: ROAand TQwith a value of 0.839 and 0.227. Also, table 2 shows thatRelationship Capital Adequacy Ratio (RCAR) has a positive correlation with the firm performance measures: ROAand TQ with a value of 0.162 and 0.101. however, the ROAhas the highest correlation.

The control variable firm size has positive correlation with firm performance measured by ROAwith the value 0.429 and a negative relationship with TQ with the coefficient value of -0.1860 respectively.

Among the explanatory variables themselves it is expected that they should have weak correlation to avoid multicolinearity. According to Gujarati (2004), the correlation between the explanatory variables should not exceed +/-0.80. However, the table revealed that the correlations among them is less than 0.80 as the highest is between CEAR and SCAR with a coefficient value of 0.676.

Table 3: Diagnostic Test and Hausman Specification Test Hausman Specfication Test

	ROA		**TQ**	
	Chi-Square	P-Value	Chi-Square	P-Value
Normality of Residual	53.55	0.000*	3.89	0.143
Heteroskedasticity Test	85.42	0.000*	5.04	0.025*
Hausman Specification test	4.78	0.443	9.27	0.099
LM test	1.56	0.106	0.65	0.201

Source: Researchers Computation 2022

The table demonstrated the result of the normality of residual test conducted using Jacque Bera test and others tests. The result shows that with respect to RA, the data is not normally distributed as the P-value is less than 5%(P-V 0.000) while TQ model reveals a normalize residual with P-value of 0.145 which is greater than 5%. Also, the table showed that the homoskedasticity assumption test is not met for both models as revealed by their respective P-values (0.000 and 0.024) which is less than 5% level . This is evidence from the significant P-value result in table 3 using Breusch-Pagan /

Cook-Weisberg test for heteroskedasticity. Due to panel nature of the data, Hausman specification test was conducted at 5% (0.05). The Hausman test shows whether the Fixed Effects or the Random Effects is reasonable for the study investigation. The result showed an insignificant P-value which suggests that fixed effect is not suitable for this study. However, the panel result from the Breusch and Pagan Lagrangian multiplier test for random effects reveals

the there is no panel effect as such, pooled OLS is suitable. Hence a robust pooled OLS regression is used in the study.

Table 4. Robust Pooled OLS Model

		ROA			**TQ(MV/BV)**	
Variables	Coefficients	T-value	P-value	Coefficients	T-value	P-value
HCAR	0.003	11.15	0.000	0.199	5.03	0.001
SCAR	0.011	1.67	0.130	0.170	0.48	0.644
CEAR	0.439	17.92	0.000	0.201	0.04	0.972
RCAR	0.067	2.40	0.040	8.76	3.31	0.009
FS	0.020	1.44	0.183	-5.44	-4.48	0.002
CONST	-072	-1.65	0.134	14.13	4.07	0.003
R2	0.887			0.194		
F-STAT	346.58		0.000	55.82		0.000
No of OBS	90			0.000		
No of group	9					
No of Years	10					

Source: Researchers Computation 2022

Interpretation

The table 4. The adjusted R^2 with respect to ROA model reveals that intellectualcapital variables and the control variables are able to explains change in ROA to the tune of 88.7 percent. Further the f-statistic square of 346.58 and p-value of 0.000reveals that the variables jointly have effect on ROTAIAof selected Deposit Money Banks in Nigeria.

Finally on the last dependent variables, TQ, the adjusted R^2 with respect to TQ model reveals humancapital variables and the control variable are able to explains change in TQ to 19.4 percent. Further the f-statistic square reveals that value of 55.86 and p-value of 0.000 this reveals that the variables jointly have effect on TQ of listed Deposit Money Banks in Nigeria.

Hypothesis Testing and Discussion

H_{01}: Intellectual Capital components does not significantly influence the Return on Assets (ROA) of selected Deposit Money Banks quoted in Nigeria

Table 4reveals that with respect to ROTAIA, Human Capital Adequacy Ratio (HCAR) has a P-Value of 0.000 and a positive coefficient of 0.003 which is significant at less than 5% level of significance. This signifies that human capital efficiency has significant relationship with ROAof selected deposit money banks in Nigeria. Hence the study rejects the null hypothesis one that there is no significant relationship between intellectual capital (human capital efficiency) and the ROA of the selected Money Deposit Banks listed on the Nigerian Stock Exchange

Table 4also shows that structural capital adequacy ratio on ROA has a P-Value of 0.130 and a positive coefficient of 0.001 which is not significant at less than 5% level of significance. This signifies that structural capital efficiency has significant relationship with ROA of selected deposit money banks in Nigeria. Hence the study fails to rejects the null hypothesis one that there is no significant relationship between intellectual capital (structural Capitaladequacy ratio) and the ROTAIA of the selected Money Deposit Banks listed on the Nigerian Stock Exchange.

In addition, Table 4 reveals That Capital Employed Adequacy Ratio(CEAR) on ROA has a P-Value of 0.002 and a positive coefficient of 0.439 which is significant at less than 5% level of significance. This signifies that Capital Employed Adequacy Ratio(CEAR) has significant relationship with ROA of selected deposit money banks in Nigeria. Hence the study rejects the null hypothesis one that there is no significant relationship between intellectual capital (Capital Employed Adequacy Ratio(CEAR) and the ROA of the selected Money Deposit Banks listed on the Nigerian Stock Exchange

Table 4 reveals that with respect to ROA, Relationship Capital Adequacy Ratio(RCAR)has a P-Value of 0.040 and a positive coefficient of 0.006 which is significant at less than 5% level of significance. This signifies that Relationship Capital Adequacy Ratio (RCAR)has significant relationship with ROA of selected deposit money banks in Nigeria. Hence the study rejects the null hypothesis one that there is no significant relationship between intellectual capital

(Relationship Capital Adequacy Ratio (RCAR) and the ROA of the selected Money Deposit Banks listed on the Nigerian Stock Exchange.

Hypothesis two

H_{02}: Intellectual Capital components has no substantial effect on the market performance of selected Deposit Money Banks quoted in Nigeria

Table 4 reveals that with respect to Tobin q, human capital efficiency has a P-Value of 0.001 which is significant at less than 5% level of significance. This signifies that human capital efficiency has significant relationship with ROA of selected deposit money banks in Nigeria. Hence the study rejects the null hypothesis two that there is no significant relationship between intellectual capital (human capital

efficiency) and the market performance (as measured by Tobin's Q).

Table 4 also shows that structural capital efficiency on Tobin q has a P-Value of 0.644 which is not significant at less than 5% level of significance. This signifies that structural capital efficiency has significant relationship with TQ of selected deposit money banks in Nigeria. Hence the study fails to rejects the null hypothesis two that there is no significant relationship between intellectual capital (structural Capital Efficiency) and market performance (as measured by Tobin's Q).

In addition, Table 4 reveals that capital efficiency on TQ has a P-Value of 0.002 and a positive coefficient of 0.439 which is not significant at less than 5% level of significance. This signifies that capital employed efficiency has no significant relationship with TQ of selected deposit money banks in Nigeria. Hence the study fails to rejects the null hypothesis two that there is no significant relationship between intellectual capital (Capital employed Efficiency (CUE)) and market performance (as measured by Tobin's Q).

Finally, Table 4 reveals that with respect to TQ, relationship capital efficiency has a P-Value of 0.009 which is significant at less than 5% level of significance. This signifies that relationship capital efficiency has significant relationship with TQof selected deposit money banks in Nigeria. Hence the study rejects the null hypothesis two that there is no significant relationship between intellectual capital (relationship capital efficiency (RCE)) and market performance (as measured by Tobin's Q).

4.2 Discussion on findings

Human Capital Adequacy Ratio HCARand Bank Performance.

Table 4.3 reveals that with ROA, HCARhas a p-value of 0.000 and positive coefficient of 0.003. This reveals that human capital efficiency has positive and significant relationship withROA selected Money Deposit Banks listed on the Nigerian Exchange . This means that increase in Human Capital Adequacy Ratio (HCAR)will increase ROA by 0.003. Thus, Human Capital Adequacy Ratio (HCAR) has positive influence on financial performance (ROA) of the selected Money Deposit Banks listed on the Nigerian Exchange.

Also, table 4 shows that TQ (Market value) and HCE has a P-value of 0.001 and positive coefficient of 0.199. This reveals that human capital efficiency has positive and significant relationship on TQ selected Money Deposit Banks listed on the Nigerian Stock Exchange . This means that increase in Human Capital Adequacy Ratio (HCAR) will increase TQ by 0.199. Thus, Human Capital Adequacy Ratio (HCAR) has positive influence on market performance (Tobin Q) of the selected Money Deposit Banks listed on the Nigerian Stock Exchange.

This is similar to resource dependency theory and prior studies by Abdulsalam et al. (2011), Adekunle and Bontis, (2012) and Al-musali and Ismail (2014).

Structural Capital AdequacyRatio (SCAR)and BankPerformance

Table 4 shows that SCAR has a P-value of 0.130 and positive coefficient of 0.011. This reveals that structural efficiency capital has positive but insignificant relationship with ROAof selected Money Deposit Banks listed on the Nigerian Stock Exchange. This suggests that that increase or decrease in structural capital will not affect ROA. Hence, SCAR has no positive influence on firm performance of the selected Money Deposit Banks listed on the Nigerian Stock Exchange. This contrary to the study by Adekunle and Bontis, (2012) and Al-musali and Ismail (2014).

Further, Table 4 shows that SCAR has a P-value of 0.644 and positive coefficient of 0.0170. This reveals that Structural Capital Adequacy Ratio (SCAR)has positive and insignificant relationship on(Market value) TQ of selected Money Deposit Banks listed on the Nigerian Exchange. This suggests that that increase or decreasein structural capital efficiency does not affect Tobin Q. hence, Structural Capital Adequacy Ratio(SCAR) has no positive influence on market performance of the selected Money Deposit Banks listed on the Nigerian Stock Exchange. This contrary to the study by Adekunle and Bontis, (2012) and Al-musali and Ismail (2014).

Capital Employed Adequacy Ratio (CEAR) and BankPerformance.

Table 4 reveals that with ROTAIA, CEAR has a P-value of 0.000 and positive coefficient of 0.439. This reveals that capital efficiency has positive and significant relationship with ROA of theselected Money Deposit Banks listed on the NigerianExchange. This suggests that increase in capital efficiency will improve ROA by 0.439. hence, Capital Employed Adequacy Ratio (CEAR) has positive influence on firm performance of the selected Money Deposit Banks listed on the Nigerian Stock Exchange. This is similar to resource dependency theory and prior studies byAdekunle and Bontis, (2012) and Al-musali and Ismail (2014)

In addition., Table 4 shows that CEAR has a P-value of 0.972 and positive coefficient of 0.0201. This reveals that capital employed adequacy ratio has a positive but insignificant insignificant relationship with TQ (Market value) of selected Money Deposit Banks listed on the Nigerian Stock Exchange. This suggests that that increase or decreasein capital employed efficiency will not affect Tobin Q. hence, capital employed efficiency has no influence on market performance of the selected Money Deposit Banks listed on the Nigerian Stock Exchange. This contrary to the study by Adekunle and Bontis, (2012) and Al-musali and Ismail (2014)

Relational Capital Adequacy Ratio (RCAR) and Bank Performance

Table 4 reveals that with regard to ROA, RCAR has a P-value of 0.040 and positive coefficient of 0.067. This reveals that Relational Capital Adequacy Ratio (RCAR)has positive and significant relationship withROA of selected Money Deposit Banks listed on the Nigerian Stock Exchange. This suggests that that increase in Relational Capitalwill increase ROA. hence, Relational Capital Adequacy Ratio (RCAR)has positive influence on the performance of the selected Money Deposit Banks listed on the NigerianExchange. This is similar to the resource dependency theory and prior studies byAbdulsalam et al. (2011), Adekunleand Bontis, (2012) and Al-musali and Ismail (2014)

Also, table 4 shows that TQ and HCE has a P-value of 0.009 and positive coefficient of 8.76. This reveals thatrelational capital efficiency has strong positive and very significant relationship onTQ selected Money Deposit Banks on the Nigerian Exchange. This means that increase inrelationship capital efficiency will increase TQ. Thus, Relational Capital Adequacy Ratio(RCAR) has positive influence on market performance (Tobin Q) of the selected Money Deposit Banks on the Nigerian Exchange. This is in tandem with the resource dependency theory and prior studies byAbdulsalam et al. (2011),Adekunleand Bontis, (2012) and Al-musali and Ismail (2014).

4.3 Conclusion

Based on the findings, it is possible to conclude that there is an overall positive link between Intellectual Capital Components and Financial Performance (ROA) and Market Performance Tobin's(Q) of Deposit Money Banks (DMBs) listed on the Nigerian Exchange from 2011 to 2020. Human Capital Adequacy Ratio (HCAR), Relational Capital Adequacy Ratio (RCAR), and Capital Employed Adequacy (CEAR) all have a positive and significant impact on ROA (financial performance).However, HCAR and RCARwere favourably and strongly associated to Market Performance (Tobin's Q).

4.4 Recommendation

Based on theconclusions above

The following recommendations are relevant:

1. Although this study concentrated on the banking business, there is enough scope to research other knowledge-intensive industries in Nigeria (e.g. consumer goods firm and pharmaceuticals).
2. Need for the regulatory authorities and accounting standard setters to sponsor standards on Intellectual capital as this will serve as an avenue for improved uniformity in compliance on issues surrounding Intellectual capital and performance.
3. There is need for Boards of corporate organizations to improve onthe quantum of human, relational and infrastructural resources that will enhance performance.
4. Need for increased investment in training programs especially at managerial levels aimed at retooling and improving human resources towards achievement of organizational goals

4.5 Contribution to knowledge

This study will contribute to regulation, theory, concept, literature, empirics, and accounting practice in the following ways

To Regulatory policy

We expect the recommendations to make the regulators look at starting with voluntary disclosure of intangible assets and specifically the value created by intellectual capital.

To Academic scholarship

Aside from the standard resource-based ideas, thispaper investigates novel theories that will help understand the relationship thenexus intellectual capital and organizational success. From a theoretical standpoint, this study will give empirical statistics on intellectual capital theory and literature, with a focus on the application of the traditional VAIC model.

To Accounting Practice: This paper bridges the theory-practice gap by providing managers of listed financial and non-financial firms in Nigeria with a deeper understanding of the importance of enhancing intellectual capital development, which plays a strategic role in corporate performance achievement and competitive advantage.

To Members of the Public: As a knowledge-based economy is necessary in world-wide competition, the article raises awareness that good management of intellectual capital in publicly traded enterprises would improve organizational performance.

Furthermore, improved organizational performance will result in more delivery of quality products and services, increased employment, and a generally better living for society

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