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Impact of Intellectual Capital Components on Performance of Listed Deposit Money Banks (DMBs) in Nigeria

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Abstract

The financial crisis and earlier recapitalization of Nigerian banks has been so challenging that merger and acquisitions have become survival strategies adopted by DMBs, this is caused by the mismanagement of their intellectual capital. Based on this, the study examined the impact of intellectual capital components on performance of listed DMBs in Nigeria, to achieve this, three (3) components of intellectual capital were identified viz: Structural capital, Relational capital and Human capital while the performance was measured using VAIC model. The study used Ex post facto research design with the population consisting of the twenty-two licensed Deposit Money Banks in Nigeria, due to unavailability of data, nineteen (19) DMBs were chosen as the sample size. Using generalized least square (GLS) regression, the study found a positive significant relationship between structural capital and performance of DMBs as evidenced by the P-value of 0.000 at 1% level of significance. This implies that, if structural capital is well managed, it will influence the financial performance of the firm. The study also found a not significant positive relationship between human capital, relational capital and performance of DMBs. The study therefore concluded that only structural capital out of the three identified components of intellectual capital influences the financial performance of DMBs in Nigeria while others are not significant. The study recommends that business executives and the entire stakeholders in the Nigerian Banking sector should begin to realize and treat intellectual capital as very important business resources.

Keywords: *Intellectual capital, Human Capital, Relational Capital, Structural Capital, Performance.*

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1.1 Introduction

Societies have experienced four different socio-economic phases throughout history, which includes primitive society, agricultural society, industrial society, and information society in which we currently live (Ozkan, Cakan & Kayacan, 2016). Prior to the information society, the focus was on traditional factors of production (labour, capital, natural resources, and entrepreneurship). However, after the emergence of information society, information technologies and intellectual capital factors took priority (Kayacan & Alkan, 2005; Stam, 2007; Kandemir, 2008; Yalama, 2013). This shift has brought about an important change in what is being

produced and what is being bought by consumers and businesses. While tangible goods or products are still being purchased directly by consumers and businesses, more and more of the emerging criteria for purchase are the intangible components of the products. This can probably explain why in 1995, International Business Machines (IBM) bought Lotus for $3.5 billion, 14 times Lotus' book value (Rylatt, 2003).

In today's knowledge economy, success or failure of a firm is determined by its learning and development capability. As even non-competitive organizations like government institutions succeed or fail based on their ability to leverage their knowledge-based assets (Omotayo, 2015). With addition of this new element of learning and development, determining the value of a firm is a difficult task because it is complicated to measure an abstract asset like knowledge. It is even more tedious because this knowledge or intellect of the firm should not be calculated as the value of the firm in its present form. It needs to be estimated on the basis of what it could become in the future, if it manages its knowledge or intellect well. Intellectual capital has become the most important tool in value creation. Yet, organizations still devote most of their time on the analysis and accounting for tangible assets. They do this by ensuring that there are processes to measure and analyze tangible assets based on existing frameworks of accounting.

All the assets of a firm can be imitated but not the intangible assets (Iqbal, Ahmad & Javaid, 2013). Intellectual Capital fits all of the criteria of a strategic asset which creates competitive advantage because a strategic asset must be valuable, rare, inimitable, and lacking tactically alike substitute (Barney, 1991). In accounting perspective, the intellectual capital with the concept of going concern is very much important (Iqbal *et al.*, 2013), and as a source of value creation and competitive advantage (Drucker, 1993; Grant, 1996), which leads companies to obtain a competitive edge (Lev & Zarowin, 1999; Ruta, 2009; Yang & Lin, 2009).Survival and competitive success of a firm, therefore, depends highly on the strategic management of its Intellectual Capital as compared to other financial resources. Businesses are therefore now focusing on the value creation through the knowledge, skills and intangible resources, rather than typically relying on financial resources or financial structure (Iqba *et al.*, 2013).

Today, forward looking companies are recognizing the need to measure and manage these assets as carefully as they do their tangible assets (Choudhury, 2010). These companies recognize that successful business units normally absorb skilled human resources who could contribute to firms through team-work activities. The banking

sector in Nigeria, being a knowledge-intensive, relationship-rich and service-oriented sector (Muhammad & Ismail, 2009; Ekwe, 2014), has recognized this fact and has also taken some drastic decisions to enhance its intellectual capital base through employment and training. Typically, banking operations involve close interaction with customers and rely, to a larger extent, on the integration of information and communication technologies for the development of new products and services (Mention & Bontis, 2013). As a result, although physical capital is essential for banks to operate, it is the intellectual capital that determines the quality of services provided to customers (Goh, 2005).

Although awareness of Intellectual Capital and its importance is constantly increasing, many organisations face problems of identification and hence measurement (Andrikopoulos, 2005; Nazari and Herremans, 2007). This is because traditional financial tools are not able to appropriately capture all of its components (Nazari and Herremans, 2007; Campisi and Costa, 2008). The search for the most appropriate method of measuring Intellectual Capital, led Pulic Ante to develop one of the most popular method Value Added Intellectual Coefficient (VAIC) (Ulum, Rizqiyah, & Jati, 2016). The method describes two key resources in creating company's value added as capital employed and IC, and IC consists of human capital and structural capital. Therefore, the VAIC model made up of three components, i.e. human capital efficiency, structural capital efficiency and capital employed efficiency. Contemporary literature, however increasingly agrees that IC can be sub-divided into human capital (skills, knowledge and abilities possessed byemployees), structural capital (non-human bank of knowledge including policies, procedures and databases) and relational or customer capital (customer relationships).

In the banking industry, being a service and highly competitive industry, the 2009 financial crisis and earlier recapitalization of Nigerian banks has been so challenging that business combinations such as mergers and acquisitions have become survival strategies adopted by many. the emphasis is place on the effective use of technology and other structural capital to render services may come at the cost of the development of human capital. Hence, banks could tend to view further expenditure on human capital development as an opportunity cost, because those funds could have been spent on physical assets which it uses to make its services more attractive and competitive. Hence, with the National Bureau of Statistics report that a great number of bank employees lost their jobs in 2017 solely because of the mismanagement of their intangible assets. It is against this background that the study investigates the effect of intellectual capital components on performance of Deposit Money Bnaks (DMB) in Nigeria.

Based on the above, the following hypotheses were stated in null form and tested empirically in order to achieve the objective of the study:

H_{o1}: There is no significant relationship between human capital and deposit money banks' performance in Nigeria.

H_{o2}: Structural capital does not significantly affect the performance of deposit money banks in Nigeria.

H_{o3}: Relational capital does not have significant effect on deposit money banks' Performance in Nigeria.

2.0 Literature Review

2.1 Conceptual Review

2.1.1 Intellectual Capital

There seems to be no single acceptable definition (Engstrom, Westnes, & Westnes, 2003; Pablos, 2004; Chang & Hsieh, 2011; Ozkan *et al.*, 2016), as the various definitions have evolved from different academic disciplines (Marr, 2007 as cited in Chu, Chan, & Wu, 2011). The International Accounting Standard Board (2014) defines intellectual capital or intangible asset as, "an identifiable non-monetary asset without physical substance held for use in the production or supply of goods or services, for rental to others or for administrative purposes. This was after it has defined an asset as "a resource, controlled by enterprise as a result of past events, and from which future economic benefits are expected to flow to the enterprise". According to Organization for Economic Cooperation and Development (1992). Intangible investments cover all long-term outlays by firms aimed atincreasing future performance other than by the purchase of fixed assets.

Intellectual Capital is often treated as being synonymous with intangible assets (Petty & Cuganesan, 2005). Stewart (1994) defined intellectual capital as the total stock of the collective knowledge, information, technologies, skills, expertise, intellectual property, team management and customer satisfaction that can be used to create organization wealth. Earlier definition by Brooking (1996), as cited in Ismail and Karem (2011) is in line with this, as it defined it as the combined intangible assets which enables the company to function. He sees an enterprise as the sum of its tangible assets and intangible assets as expressed in the following formula:

Enterprise = Tangible Assets + Intellectual Capital.

In addition, Edvinson and Malone (1998) and Grafstrom and Edvinson (1999), using a tree as a metaphor described intellectual capital as partly a story of interlinked activities that happen all over the tree at any particular moment in time. This illustrates not only the relation between past and future, but also the intervention that is necessary in order to make fruition maximally efficient (Mouritsen *et al.*, 2001). They further explain that:

> If we compare the intellectual capital to a tree, the ripe fruit of the season's effort can be seen in the crown – i.e. in the annual report's income statement and statement of financial position, (see figure 2.1). The human core in the trunk is protected by the bark of customer relations and work routines. Research and planning, which the tree needs in order to survive future droughts and colds spells, is carried out in the root system. At a time marked by quick and capricious changes in business environment, it is at the roots where the most crucial activity may take place, for future fruition.

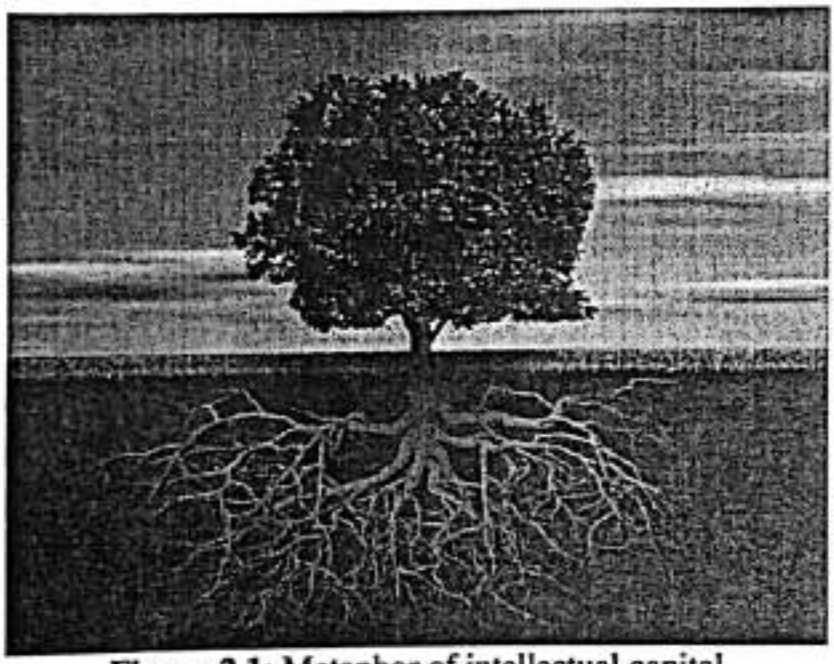


Figure 2.1: Metaphor of intellectual capital
Source: Slade (2013)

2.1.2 Components of Intellectual Capital

There seems to be no universal classification regarding the components of the intellectual capital. Some researchers earlier identified three (3) components, categorizing intellectual capital into human capital, customer capital and structural capital (Brooking, 1996; Edvinsson, 1997; Stewart, 1997; Sveiby, 1997; Bontis 1998; Bontis *et al.*, 2000; Yıldız, Meydan & Güner 2014; Ekwe, 2014; Makki &

Lodhi 2014). Wu and Tsai (2005) introduced two more components, social capital and technological capital. Ismail (2005) extended the components to include spiritual capital. Ramezan (2011) however, identified the component of intellectual capital as including human capital, organizational capital or structural capital, technological capital, social capital and business process capital or customer capital.

Human capital includes various skills, education, knowledge, and abilities possessed byemployees for the sustainable development of the enterprises (Guthrie, 2001; Seetharaman *et al.*, 2004; Ding & Li, 2010; Yıldız, 2010). Though, human capital (HC)is the personal information stock of the company, it is represented by employees and is the source of organizations' inventions and strategic innovation (Pablos, 2002). Human capital compared to other capitals or equipment, is considered as the most valuable asset in any business (Kianto, Andreeva & Pavlov, 2013; Hashim, Osman & Alhabshi 2015). It is also recognized as a main component of intellectual capital (Edvinsson and Malone, 1997; Stewart, 1997; Bontis, 1998; Shaari,*et al.*, 2010), without which nothing can happen in the firm (Kianto *et al.*, 2013). Yet it is believed to be the most ignored asset by the firms (Hashim *et al.*, 2015). It also, notonly increases the operational efficiency in using tangible assets but creates intangibleassets as well (Makki and Lodhi, 2014). According to Roos and Roos (1997) and Shaari *et al.*, (2010) successful creationof intellectual capital are mainly based on the competences, attitude and intellect of employees as it is the heart of intellectual capital.

Structural capital (SC) however, is another important component of intellectual capital. It comprises of all non-human storehouse of knowledge in organizations, which includes organizational competitive intelligence, routine, formula, policies, procedures and databases (Salleh & Selamat, 2007; Cabrita, 2009), as well as anything whose value to the company is higher than its material value (Bontis *et al*, 2000). Structural capital, according to Maheran (2009) encompasses the enabling structures that allow the organization to exploit the intellectual capital, it is the whole organizational capabilities, which are owned by the business and enables the company to meet the market requirements (Pirtini, 2004). It also involves elements such as culture, intellectual property, system and processes that are kept within the enterprise when the employees go home in the evening (Huang & Hsueh, 2007). SC equally represents the competitive intelligence, formulas, information systems, patents, and policies, processes that result from the products or systems the firm has created over time. It can also be considered as those capabilities that remain in the organization when employees leave (Edvinsson & Malone, 1997 as sited in Kianto *et al.* 2013; Bontis, 1998).

However, SC falls into two categories, which are the outcomes and products of knowledge conversion; tangible items offered by an organization such as documents, patents, trademarks, databases, process descriptions, trade secrets, and trade and service marks etc., and intangible resources such as culture, transparency and trust among employees. Thus, SC represents both the context and the outcome of human capital (Celik & Percin, 2000; Kianto, Andreeva & Pavlov, 2013). Organizations with strong structural capital will reach its fullest intellectual capital potential and will have a supportive working culture for its employee to learn and be innovative (Bontis, 1998; Bontis *et al.*, 1999). Thus, organizations that possess strong structural capital will have a supportive culture that permits their employees to try new things, learn and practice it (Bontis *et al*, 2000).

Customer Capital (CC) is also known as Relational Capital or External Capital (Bontis, 2000). It was defined by Bontis (1998) as the knowledge embedded in the marketing channelsand customer relationships. It is mainly based on marketing capability, customer loyalty, and relationship with customer and customer satisfactions (Amiri, Majid & Omrani, 2010). It can also be described as the ability of an organization to interact in a positive manner with the external stakeholders, thereby actualize the wealth creation potential of human and structural capital (Kianto *et al.* 2013). CC was adjusted to relational capital based on the argument by Bontis, (2000) that it not only the customers' contribution that affects intellectual capital but the whole lot of relations with customers, suppliers, shareholders and other partners. It includes resources related to the firm's external relationships, such as its connections with its customers, suppliers, partners, and the local community, and the knowledge embedded in these relationships (Sveiby, 1997; Edvinsson & Malone, 1997; Bontis, 1998). It also involves elements such as brands, customers, customer satisfaction, and relations with customers (Guthrie, 2001; Cıkrıkcı & Dastan, 2002).

2.1.3 Models for Measuring Intellectual Capital

Over the years, a number of models have been formulated and developed to measure intellectual capital. This growing number may be explained by the fact that as important as Intellectual Capital may be to the performance of an organization, there has not been any universally accepted and recognized method of Intellectual Capital valuation or measurement. The interest and desire to manage IC has therefore resulted in the development of different methods of measurement, even though some of these methods have emerged from companies for internal use and not initially created as a universal measuring or valuation method (Svanadze, and Kowalewska,

2015). According to Sveiby (2010), methods of measuring intangible assets can be divided into four main groups:

i. Direct Intellectual Capital Methods (DICM): Estimation value of intangible assets is first determined by identifying the components. Once these components are identified, they can be directly evaluated either individually or as an aggregated coefficient.
ii. Market Capitalization Methods (MCM): Calculates of the difference between a company's market capitalization and its stockholders' equity as the value of its IC.
iii. Return on Assets Methods (ROA): Calculates average pre-tax earnings of a company divided by the average tangible assets. The result is a company's ROA that is then compared with its industry average.
iv. Scorecard Methods (SC): Identifies various components of IC with generated results reported in a scorecard or in graphic format.

In this study, four (4) methods, one for each category will be discussed. Under the first category, Technology Broker method as a DICM method, estimates the value of intellectual capital through a diagnostic analysis of the answers to twenty (20) questions, covering its main counterparts: human-centered assets, infrastructure assets, intellectual property assets and market assets (Bontis, 2001). Market assets equal the potential an organization has due to market-related intangibles such as brands, customers, repeat business, distribution channels, contracts and agreements such as licensing and franchises. Human-centered assets are the collective expertise, creative and problem-solving capability, leadership and managerial skills embodied by employees of the organization. Intellectual property assets contain the legal mechanism for protecting many corporate assets, and infrastructure assets including know-how, trade secrets, copyright, patent and various design rights, technologies, methodologies and processes which enable the organization to function (Jurczak, 2008). Each component of Brooking's IC model is then examined via a number of specific audit questionnaires that ask questions specific to those variables thought to contribute to that asset category and the answers are thereafter, scored on Likert scale.

Under Market Capitalization Methods, Market-to-Book Value method is based on the assumption that the increase in market value of an entity (the value of shares of shareholders) to its book value represented in the intellectual capital of the entity (Mohamed, 2017). Hence, Intellectual capital is expressed as residual value.In order to use this method the book value which is calculated by historical cost must be adjusted to substitutive cost, this is to enable calculate the value of intellectual

capital to be estimated more accurately, because of historical data deformity measurement process (Jurczak, 2008).

As a score card method, Skandia navigator was designed to produce a balanced view for the intellectual capital and financial capital of the organization and it has been described as a combination of the Balance Score Card and intangible assets monitor (Sveiby, 1998). The Skandia Navigator approach takes into account the same set of financial, operational, and customer concerns as the Balanced Score Card. It however makes more explicit the need to consider the organization, its structure and processes for nurturing its employees (Shand, 1999). The major feature of this model is that it presents a balanced and completed view of the organization's operations and that by focusing on five dimensions (Customers, Processes, Human, Financial and Research & development). Edvinsson (1997) described the navigator as a house with financial focus as roof, customer focus and process focus as the walls, human focus as the soul of the house and renewal and development focus as the platform. Therefore, the renewal and development become the critical bottom line for sustainability."

Finally, Value Added Intellectual Capital (VAIC) a model under Return on Assets Method is considered appropriate for organizations that are intellectually inclined (Kamath, 2007) like banks. It measures the efficiency of three types of inputs: capital employed (physical and financial), human capital, and structural capital (Firer & Williams, 2003). The main assumption of the VAIC methodology is that it intends to calculate economic income, which Pulic (2000) labels as value-added, in a different way by treating labor expense as an asset and not as expenses. Hence, when calculating the value-added of a firm, Pulic (2000) deducts all labor expenses and calls it human capital. It is a performance indicator of the overall level of utilization of the intellectual capital. Goh (2005) stated that as a performance indicator, the higher the VAIC, the better is the efficiency level of the firm. If VAIC risesover time, then efficiency level improves and more value is created. On the other hand, when VAIC falls,efficiency deteriorates and value is destroyed.

The advantages of VAIC methodology include the fact that it is practical and easy to use (Mavridis, 2004). It is considered appropriate to measure the intellectual performance over a period of time without much change in the existing business setup (Kamath, 2007). Furthermore, it enables various stakeholders to effectively monitor and evaluate the efficiency of Value Added by a firm's total resources and each major resource component (Gan & Saleh, 2008). Hence it clearly depicts the contribution of each intellectual capital component to value creation (Janosević *et*

al., 2013). The methodology however has some limitations including the fact that it was not primarily aimed at valuing the intellectual rather it primarily measures the efficiency of firms' three types of inputs mentioned earlier. It fails also to incorporate the level of company risk which is an important factor in intellectual capital value determination and to measure intellectual capital in companies with negative book value or negative operating profit (Joshi, Cahill, & Sidhu, 2010 and Chu, Chan, & Wu, 2011). Furthermore, since VAIC is calculated using the financial statements of companies, it implies that the coefficient is a measure of value created in the past and not that of value creation potential (Janosević *et al.*, 2013). Despite these inherent limitations of VAIC methodology, it remains one of the most popular measures of intellectual capital (Jafaridehkordi & Abdul Rahim, 2014)

2.1.4 Concept of Organizational Performance

Organizational performance is the most important criterion in evaluating organizations, their actions, and environments. While there seems to be no specific theoretical perspective or adequate empirical evidence that supports the superiority of any specific proxy measure of performance over the others, traditional performance measures fail to measure and monitor multiple dimensions of performance as they concentrate almost only on financial aspects of the organizations (Ekwe, 2014). Therefore, this study recognizing the multi-dimension system of performance measures and in order to reflect the overall performance of deposit money banks, used all four metric of balanced score card. That is financial, customer satisfaction, internal business, and learning and growth perspectives.

Financial measures convey the economic consequences for the actions already taken by the organization, and focus on the profitability related measures on which the shareholders verify the profitability of their investment. Return on Asset (Ting and Lean, 2009; Yalama, 2013; Joshi *et al.*, 2013; Iqbal *et.al.* 2014) and Return on Equity (Makki and Lodhi, 2014) which are commonly used proxies for measuring financial performance were adopted for the purposes of the study. Return on Assets (ROA), is a measurement of the earnings attributable to each naira of the asset owned in the organization during a given period. ROA is the key measure of bank profitability(Dietrich & Wanzenried, 2011; Pasiouras & Kosmidou, 2007). It is calculated by the ratio of the net income (less preference dividends) divided by book value of total assets as reported in the annual reports (Williams & Firer, 2003).

ROA reflects banks efficiency in utilizing total assets and as an indicator of profitability and good overall indicator of bank's performance. Investors and potential investors use this ratio to evaluate a company s leadership and how much

profit a company generated for its assets. It provides information about the value added to the company that lead to better performance of that company and is generally accepted as a valid measure of overall company performance (Core, Holthausen & Larcker, 1999). This ratio is usually used to measure the effective use of resources in the organization (Anuonye, 2016). It is expressed mathematically as:

ROA= Net Income / Total Assets

Profit before tax is more suited for this measurement because taxes are not controllable by management and since firms' opportunities for availing tax incentives differ, it may be more prudent to use profit before tax to measure ROA (Pandey, 2010). An increase in the ROA is an indication of improved profitability and improved performance of a company, (Flamholtz, 1999).

Return on Equity (ROE) measures an organization's profitability by revealing how much profit the organization generates with the money shareholders have invested (Ekwe, 2014). The Return on Equity (ROE) is the after-tax profit divided by book value of equity.

It represents the ultimate measure of how well the companies serve the economic interest of their shareholders. ROE reveals how much profit a company earns in comparison to the total amount of shareholder or shareholders fund, found on the statement of financial position. The shareholder equity is equal to total assets minus total liabilities. It represents the assets created by the retained earnings of the business and paid-in capital of the owners. ROE is used as an alternative measure of profitability and reflects the return to owner's investment. ROE is a typical performance benchmark in many empirical studies (Abowd 1990; Main *et al.*, 1996; Kern & Kerr 1997; Core *et al.*, 1999). It is expressed mathematically as:

ROE = Net Income / Shareholder's Equity

2.2 Theoretical Framework

Various theories relevant to Intellectual Capital have been reviewed. The objective of this study being to examine impact of intellectual capital on Performance of deposit money banks in Nigeria is hinged on Resource Based Theory. Resource Based View Theory (RBVT) is primarily focused on a collection of valuable resources or assets which are owned and controlled by a firm, thus, providing the firm with the basis for sustainable competitive advantage (Barney, 1991). RVBT is developed based on the assumption that the strategic resources are heterogeneously distributed across firms and these differences are stable over time. Furthermore,

these strategic resources are their internal capabilities which are valuable, rare, imperfectly imitable and non-substitutable. These may include a firm's management skills, its organizational processes and routines, as well as the information and knowledge it controls (Barney, Wright and Ketchen Jr., 2001). RBT perspective, successful firms will find their future competitiveness on the development of distinctive and unique Intellectual Capital, which is implicit and intangible in nature. Intellectual capital is a valuable resource as it enables organization to exploit the opportunities from the environment through human capital and Structural capital and rare as similar Intellectual capital can only be found in a small number of competing firms due to the differences in the nature of human capital. Also, IC is not easily imitability as the IC of an organization cannot be obtain through direct duplication or substitution and if an organization organizes its processes, policies, organizational structure and culture it can fully realize the potential of its intellectual capital.

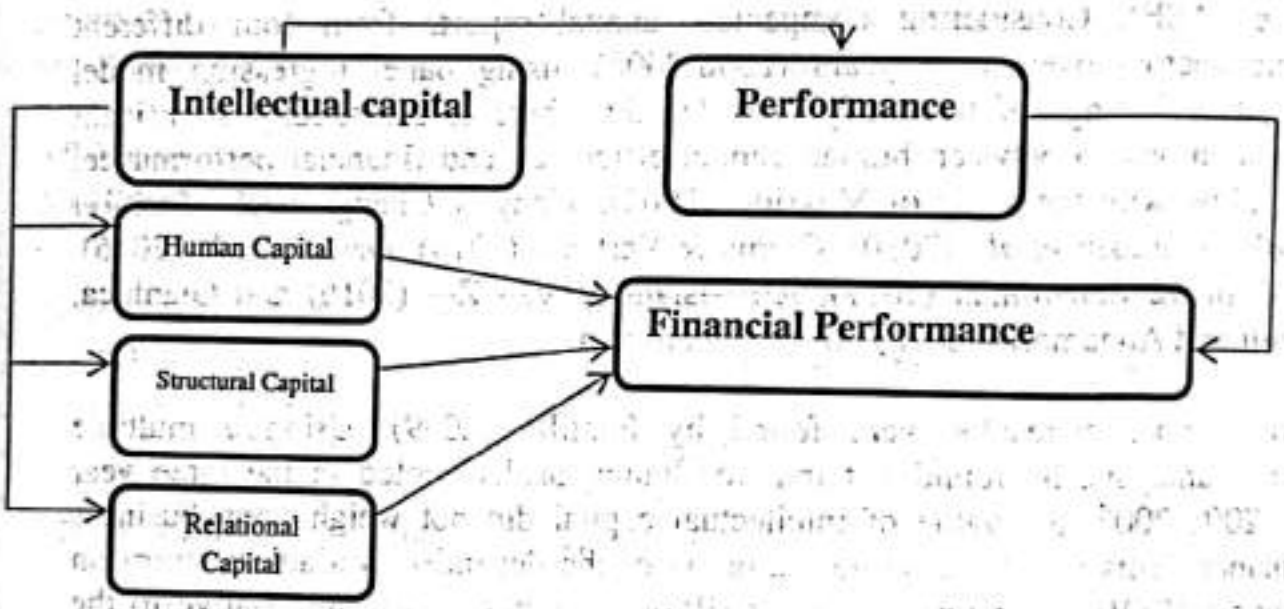


Figure 2.1 Conceptual Framework
Source: Researcher's Research model, 2019

The diagrammatic representation is an illustration of the author's own perspective on the dependent and independent variables in this study. Dependent variables being the four perspectives of performance suggested by balance score card while the independent variables are Human Capital, Structural Capital and Relational Capital.

2.3 Empirical Review

As early as 1998 researchers started linking Intangible Assets to firm's performance and competitive advantage. Bontis (1998) in his exploratory pilot study showed a valid, reliable, significant and substantive causal link between intangibles and business performance.

More recently, Gianluca, Calderalli and Annamoria (2018) explored the impact of intellectual capital on company's reputation and performance of non- listed companies in Italy. Using several regression analyses to estimate a unique data set of 452 non-listed companies in Italy, it was found that human capital efficiency is a key driver of corporate reputation. The study also reflects that there is a positive relationship between intellectual capital elements and various measures of financial performance. Also, a study conducted in Greece by Maditinos, Chatzoudes, Tsairidis and Theriou (2019) who studied the impact of intellectual capital on firms' market value and financial performance of listed 96 Greek companies in Athens Stock exchange (ASE). Considering companies' annual reports from four different economic sectors over three years (2006-2008), using panel regression model analysis, the findings of the study provides that there is statistically significant positive relationship between human capital efficiency and financial performance. This is inline with the study of Mavridis (2005), Wang & Chang (2005), Joshi *et al.*,(2010), Sharabati *et al.*, (2010), Crema & Verbano (2014), *Ozkan et al.*, (2016), Kurfi, Udin, & Bahamman (2017), Ariff-Islam & Van Zijl (2016) and Gianluca, Calderalli and Annamoria (2018) to mention in view.

However, opposite results were found by Puntillo (2009). Using a multiple regression analysis, he found out that for Italian banks quoted in the three year period; 2005-2007, the value of intellectual capital did not weigh upon business performance. This was because the variation of the dependent variables; return on investments (ROI) and return on assets (ROA) was not significant relative to the variations of the independent variable, represented by the value of human capital efficiency and structural capital efficiency. Also, a study by Hudgins (2014) in the United States (U.S.) examined the relationship between intellectual capital and organizational performance. Intellectual capital was measured also using Pulic's VAIC model consisting of combined measures from human capital, structural capital, and capital employed, and firm performance was measured as return on assets. Data was drawn from 11 publicly traded U.S. property-casualty insurance companies trading on the New York Stock Exchange (NYSE). The findings of his analyses did not support a significant relationship between intellectual capital and performance. However, it provided evidence to support a strong and highly significant association between structural capital as one of the three individual

components of VAIC and organizational performance. The regression results confirmed each of the models was a strong predictor of explaining the change in the performance of the organizations.

In the same vein, Anuonye (2016) evaluate the effect of Intellectual Capital in the value creation of insurance firms in Nigeria. A mix of Primary and secondary data was employed with a sample size of 150 in the 3 strategic departments of human resources, accounts and marketing of 18 insurance companies. Results obtained from the primary data revealed that structural capital and relational capital had positive significant effect on ROA, while results from the secondary data analysis revealed that human capital has negatively significant effect on ROA and Relational capital was also positively significant on ROA. It was concluded that human capital, structural capital and relational capital each had a statistical weak relationship with return on assets of insurance companies in Nigeria.The result of the Puntillo (2009) and Anuonye (2016) is in tandem with the study of Kamath (2007).

3.0 Methodology

3.1 Research Design

In order to achieve the objectives of this study, ex-post facto research design was adopted. The population of this study comprises of all the twenty-two licensed deposit money banks in Nigeria by Central Bank of Nigeria (2017). The whole of the population should have been taken following the recommendations of Stutely (2003) and Fisher (2007) but Nineteen banks were therefore chosen as sample due to non-availability of data for the period of study as content analysis was done on the annual reports and accounts of the listed deposit money banks in Nigeria.

3.2Definition and Measurement of Variable

Intellectual Capital as the independent variable was proxy with three components, namely; human capital, structural capital and relational capital. To measure these components, this study adopted Value Added Intellectual Capital (VAIC) method. The study uses organizational performance proxy by financial performance, as the dependent variable and subsequently measured by Return on Asset and Return on Equity. Human Capital Efficiency, Structural Capital Efficiency and Relational capital efficiency were used as independent variables. According to Pulic (1998), VAIC is a composite sum of two major indicators these are: Capital Employed Efficiency (CEE); indicator of value-added efficiency of capital employed which is defined as the book value of a firm's net assets, and Intellectual Capital Efficiency (ICE); indicator of value added efficiency of banks' Intellectual Capital base.

In this study, based on the recommendations of Ulum (2014), Intellectual Capital Efficiency is composed of three other variables; Human Capital Efficiency (HCE), which is an indicator of value added efficiency of human capital, Structural Capital Efficiency (SCE) which is an indicator of value added efficiency of structural capital and Relational Capital Efficiency, an indicator of an indicator of value added efficiency of relational capital. Equation (1) formalizes the VAIC relationship algebraically:

VAIC = CEE + HCE + SCE + RCE---------- [Equation (1)]

Where:

VAIC = VA intellectual coefficient of the banks,
CEE = capital employed efficiency coefficient of the banks,
HCE = human capital efficiency coefficient of the banks,
SCE = structural capital efficiency of the banks and
RCE = relational capital efficiency of the banks

Pulic (1998) states the higher the VAIC coefficient, the better the efficiency of VA by a firm's total resources. The first step in calculating CEE, HCE, SCE and RCE is to determine a firm's total VA. This calculation is defined by the following algebraic equation:

VA = I + DP + D + T + M + R + WS ---------- [Equation (2)]

Where: VA (value added) for the banks are computed as the sum of interest expenses (I); depreciation expenses (DP); dividends (D); corporate taxes (T); equity of minority shareholders in net income of subsidiaries (M); and profits retained for the year (R) wages and salaries.

Alternatively, VA can be calculated by deducting operating expenses (materials costs, maintenance costs, other external costs) from operating revenues (Pulic 1998).

CEE = VA/CE ---------- [Equation (3)]
HCE = VA/HC ----------[Equation (4)]
SC = VA – HC ----------[Equation (5)]
SCE = SC/VA----------[Equation (6)]
RCE = RC/VA ---------- [Equation (7)]

Where: CEE = capital employed efficiency coefficient of the banks,
HCE = human capital efficiency coefficient of the banks,
RCE = relational capital efficiency coefficient of the banks,
VA = VA of the banks,
CE = book value of the net assets of the banks,
HC = total salary and wage costs of the banks,

SC = structural capital of the banks; and
RC = relational capital of the banks,

3.3Model Specification

The model definition and analysis of this study is based on Pulic (1998, 2000, and 2004) intellectual capital measurement criteria using the Value-Added Intellectual Coefficient (VAIC). The equation shows that OP is the dependent variable which is explained by the following independent variables- HCE, SCE and RCE.

Where:

$OP = \alpha_0 + \beta_1 HCE + \beta_2 SCE + \beta_3 RCE + \mu$

OP= Organizational Performance
HCE= Human Capital Efficiency
SCE= Structural Capital Efficiency
RCE= Relational Capital Efficiency
α = Intercept
μ = Error term

4.0 Results and Discussion of Findings

4.1Preliminary Analysis of Secondary Data

Again, to guarantee data quality, prior to running multivariate regression analysis for the secondary data, key assumptions related to multivariate regression analysis have to be examined. This is to ensure that errors in prediction of the model stem from absence of associations among variables and not from data characteristics that failed to be accommodated by the regression method (Hair *et al.*, 2010). These assumptions include normality, multicollinearity, linearity test, absence of heteroscedasticity, contemporaneous correlation, and autocorrelation.

4.1.1 Normality Test

One of the basic assumptions in multivariate analysis is that a significant deviation from normality will result in an invalid statistical outcome (Hair, Black, Babin, Anderson & Tatham, 2006). The residual in multivariate analysis; the difference between the values (observed and predicted) is expected to possess independent and normal distribution. As such, the researcher assessed the residual for normality. In case the residuals meet the assumption, the normality of individual variables should be checked (Tabachnick & Fidell, 2007). Among the common statistical normality tests are skewness and kurtosis; and histogram. The latter on the other hand, refers to the distribution peakedness or flatness in relation to normal distribution. Kurtosis and skewness usage in statistical tests are sensitive to a large set of data (Tabachnick &

Fidell, 2007). A variable characterized by skewness or kurtosis does often display considerable deviation from normality and hence, does not significantly impact the analysis. According to Tabachnick and Fidell (2007), the distribution shape can be observed on a graph. The residual distributions according to standardized normal probability plots ***(pnorm)*** that are sensitive to non-normality in the middle data range were noted.

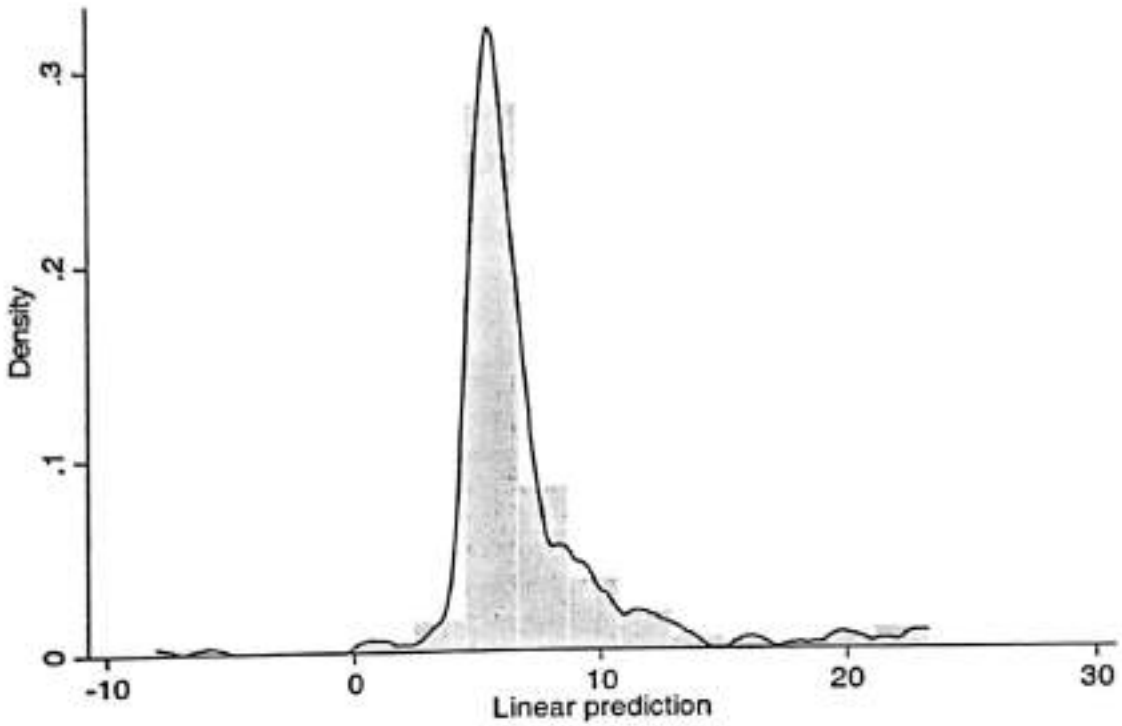


Figure 4.1Histogram and Normal Probability Plots for Deposit Money Bank Financial Performance
Source: Field Survey Data, (2018).

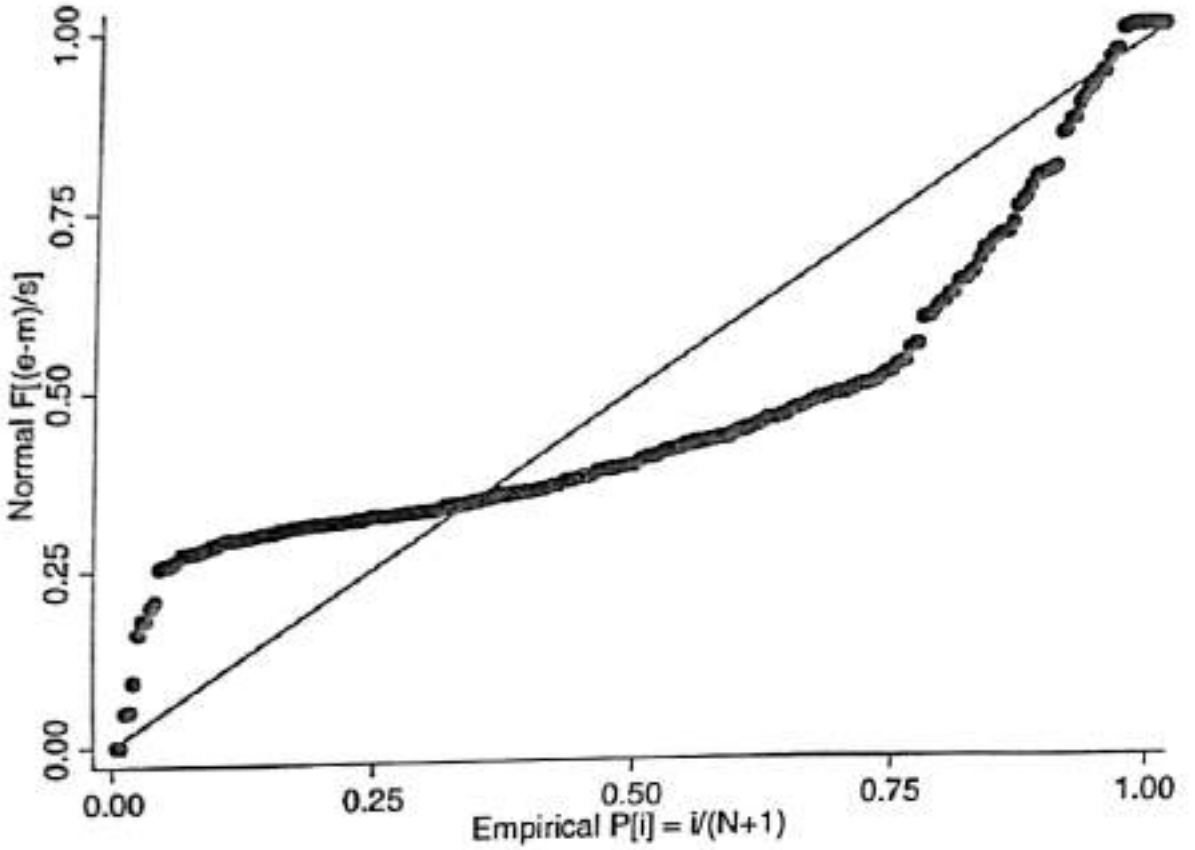


Figure 4.6 Scatter plots between HC, SC, RC and financial performance.
Source: Research Survey, (2018).

4.1.2 Multicollinearity

Along with the correlation test, the variance inflation factor (VIF) was conducted because the examination of the matrix correlations between variables does not always detect multicollinearity (Hamilton, 2009). An issue of multicollinearity arises if the independent variables correlation goes over 0.9 (Tabachnick and Fidell, 2007 and Hair *et* al., 2010). VIF indicates the impact that other independent variables have on the standard error of regression coefficients. Collinearity problems are said to exist if VIF is over 10 as stated by Tabanichnick and Fidel (2007). Variables are free from issue of multicollinearity as shown in Table 4.18.

Table 4.18: Collinearity Diagnostic Test

VARIABLES	VIF	1/VIF
Organizational Performance (FP)	1.24	0.81
Human Capital (HCE)	1.05	0.95
Structural Capital (SCE)	1.36	0.73
Relational Capital (RCE)	1.17	0.85

Source: Research Survey, (2018).

4.1.3 Breausch-Pagan LM test

Breusch-Pagan LM test was conducted in order to compare between the OLS and RE model. The primary difference between the two models being their consideration of individual effects. Hence, a statistical test can be created on the basis of the notion of the presence or absence of ui denoting random effect. For this determination, the Breausch-Pagan LM test is appropriate. The test is primarily based on the idea that if ui is equal to zero for the entire i's, then, there is no individual heterogeneity and this indicates that the pooled OLS model is suitable to be used. If on the other hand, the LM test generates significant chi-square value, indicating a low p-value that is less than 0.05, the null hypothesis rejects pooled estimates suitability. Hence, the fixed effects method is preferred over the pooled OLS.

Table 4.19 Breausch-Pagan LM test

	Test: Var(u)	Chibar2(01)	Prob>chibar2
Firm's Perf. (FP)	0	182.34	0.000
H_0	Reject	Reject	Reject

Source: Research Survey, (2019).

Based on Table 4.19, which shows that the prob>Chi bar is positive at p= 0.001 (larger than 0.05), it is safe to use fixed effects.

4.1.4 Hausman Test

Greene (2008) stated that the assumption underlying the random effects model concerning the absence of correlation of individual effects with other regressors lack justifying evidence. Hence, it may contain inconsistency when such correlation is present. As mentioned, the primary factor distinguishing fixed effects from random effects is if the error term is associated with independent variables and, on this basis the choice between fixed effects method and random effects method of panel data regression involves the determination of the correlation through the Hausman specification test. Keeping in mind that the fixed effects model considers the presence of correlation between independent variables and error term, whereas the random effects model does not. The Hausman specification test is used when running the models to examine whether or not there is a correlation between the explanatory variables and the error term. If a significant p-value is generated, the null hypothesis is rejected and the fixed effects model is opted. In the present study, the researcher performed Hausman tests for firm's performance and results are significance at the level of 1%. Thus, fixed effect is accepted and random effect rejected. (see table 4.20).

Table 4.20 Hausman Test

	Chi2(2)	Prob>chi2
Firm's Perf. (FP)	15.44	0.0004
H_0	Reject	Reject

Source: Research Survey, (2018).

4.2 Discussion of Findings

4.2.1 Correlation Analysis

Table 4.21 revealed the direction of association of the variables of study. Results shows that there exists a (0.038) positive but weak association between the frequency of human capital (HCE) and the financial performance of banks in Nigeria (see table 4.21). This means that increase in the banks' financial performance is associated with increased in the HCE. The results also show that there exists a (0.51) positive and large association between the financial performance and the structural capital. This finding reveals that the increase in financial performance is associated with increase in structural capital (SCE) in Nigeria. In the same results we observed that

there exists a (0.018) positive but weak association between the frequency of financial performance and the relational capital (RCE).

The finding also shows that the increase in financial performance is associated with increase in the number of capital employed in Nigeria. Lastly, Value added intellectual capital (VAIC) and the financial performance were positively and strongly correlated. This finding clearly shows that the increase in VAIC is associated with the increase in the value of financial performance in Nigeria. The conclusion from our correlation analysis results is that the increase of Intellectual capital in Nigeria may be largely associated with the increase in financial performance of the money deposit bank in Nigeria.

Table 4.21: Correlation Matrix

	HCE	SCE	RCE	CEE	VAIC	FP
HCE	1.0000					
SCE	0.0701	1.0000				
RCE	0.4194	0.0262	1.0000			
CEE	0.0001	0.0074	0.0001	1.0000		
FP	0.0381	0.5085	0.0188	0.0858	0.0250	1.0000

Source: Research Survey, (2018).

4.2.2 Result of Regression Analysis

In testing the hypotheses for this study, the researcher used multiple least square (MLS) regression and we also presented generalized least square (GLS) regression result when the problem of autocorrelation is corrected for. Table 4.22 shows the results. This model focused on estimating the relationship between the independent variables (i.e. human capital, structural capital and relational capital) and dependent variable (financial performance).

Table 4.22: Regression Model

Variable	fixed	random	gls
HCE	.00473241	.00461726	.00062376
SCE	7.4428776***	6.6015915***	4.0813503***
RCE	(omitted)	(omitted)	(omitted)
_cons	3.8622262***	4.1901076***	5.1799452***
N	228	228	228
F-statistics (2,225) =			39.80
Prob > F-statistics =			0.0000
R-squared =			0.2613
Adj R-squared =			0.2548
Root MSE =			4.047

FP	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
HCE	.0006238	.0151899	0.04	0.967	-.029309	.0305565
SCE	4.08135	.4579861	8.91	0.000	3.17886	4.983841
RCE	0	(omitted)				
_cons	5.179945	.3244294	15.97	0.000	4.540637	5.819254

legend: * p<0.05; ** p<0.01; *** p<0.001, Note: * is 1% level of significance.
Source: Research Survey, (2019).

In the table 4.24, the GLS regression with R-squared value of 0.25 shows that about 25% of the systematic variations in the dependent variable was jointly explained by the independent variables. This implies that financial performance in Nigerian deposit money banks which is the dependent variable cannot be 100 percent explained by all the intellectual capital variables used in this study. The F-statistic value of 39.80 and its associated P-value of 0.000 shows that the GLS regression model on the overall is statistically significant at 1% level, this means that the regression model is valid and can be used for statistical inference.

4.3 Summary of Findings

Hypothesis (H_1) predicts that there is no significant relationship between human capital and deposit banks' performance.Human capitalas an independent variable to financial performance, with P=0.964in Nigerian deposit money banks (FP) appears

to have a negative and insignificant influence at 5% level. This means there is 95% confidence that increase in the human capital (HCE) can help to significantly increase financial performance in Nigerian DMBs. Hence, hypothesis one should be accepted as there is no significant relationship between human capital and performance of DMBs. This result is contrary to a priori expectation and does not agrees with prior empirical results which show that human capital (HCE) has no significant relationship with the frequency of fraud detection. This is however in line with the result of Wang & Chang, (2005), Puntillo, (2009), and Jardon & Martos, (2009).

Hypothesis (H_2) states that structural capital, does not significantly affect the performance of deposit money banks.Structural capital (SCE p = 0.000)) an independent variable to frequency of financial performance in Nigerian deposit money banks (FP) appears to have a positive and significant influence at 1% level of significance. This means there is 99% confidence that increase in structural capital can help to significantly increase the financial performance in Nigerian deposit money banks. This therefore means we should reject hypothesis two as there is significant relationship between the structural capital and financial performance in DMBs. This result agrees with results of prior studies (Wang and Chang, 2005; Puntillo, 2009; Jardon and Martos, 2009) and with a priori expectations.

Hypothesis (H_3) predicted that relational capital does not have significant effect on deposit money banks' performance. Relational capital as an independent variable to financial performance in Nigerian deposit money banks (FP) appears to have the issue of multicollinearity. Stata is sophisticated software that easily removes any variables that have the multicollinearity issue. Hence, hypothesis three is, is automatically accepted as there is no significant relationship between relational capital (RCE) and performance in the Nigerian money deposit bank. This result agrees with prior empirical results which show that the relational capital of money deposit bank has no relationship with the financial performance (Wang & Chang, 2005; Puntillo, 2009; Jardon & Martos, 2009). Most specifically, the results did not agree with a priori expectation.

5.0 Conclusion and Recommendations

Based on the discussion of findings above, the study concludes that only structural capital out of the three components of intellectual capital has significance influence on financial performance of Deposit Money Banks in Nigeria while relational capital and human capital does not influence the performance of DMB in Nigeria.

In view of the above, the study therefore recommends that Business executives and the entire stakeholders in the Nigeria Banking sector should begin to realize and treat intellectual capital as a very important business resource and also, Banks executives should be able to channel their organization's intellectual capital as a source to achieve a competitive advantage.

Future research should address the issue of intellectual capital by looking at components different from Human capital, Structural Capital and Relational Capital since components of intellectual capital varies. Also, future study should expand the scope of the study by exploring other sectors like oil and gas, conglomerates, industrial goods, consumer goods etc.

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