The Relationship between Intellectual Capitals and Growth in Revenue of Deposit Money Banks in Nigeria

Michael Chidiebere Ekwe (Ph.D., ACA)

Department of Accountancy, Enugu State University of Sci. & Tech., Enugu, Enugu State of Nigeria

Email: ekwemike@yahoo.com

Abstract

In today's business world, most organisations are established for the purposes of making profit and giving a high return on the investments of stakeholders. The extent an organisation can go in achieving this onerous objective depends on the amount of revenue such organisation is able to generate from its operations as there seem to be a direct relationship between the level of revenue generated and the amount of profit made by an organisation. There has been this belief that it is the amount of physical resources (assets and finance) invested in a firm that determines the amount of profit the firm makes. The use of high technology, information, and innovation based environment in recent times, has taken the centre stage in the global economy. Under this new technology, knowledge, ability, skills, experience and attitude of workers, assume greater significance even as organizations utilize their intellectual capital as a critical resource to enhance their performances. Organisations nowadays use their intellectual capital in combination with their physical assets to sharpen their competitive edge against their competitors. Organizations which have managed their intellectual capital better, are observed to have achieved stronger competitive advantage than the general enterprises. Following from above, it is expected that there should be a positive relationship between intellectual capital and growth in revenue of banks in Nigeria. Empirical records of studies on this relationship in some developed nations showed divergent opinions. Unfortunately, no empirical records on the relationship of intellectual capital and growth in revenue in the Nigeria Banking sector exist. This study had the broad objective of using the Value Added Intellectual Coefficient (VAIC) model to investigate if there is a positive and significant relationship between the Intellectual Capital indices (such as Human Capital Efficiency, Structural Capital Efficiency and the Capital Employed Efficiency) and growth in revenue of selected banks in Nigeria. The study adopted the ex-post facto research design. It was systematically conducted using longitudinal time series data generated and computed from the annual reports and accounts of the selected banks in Nigeria spanning from year 2000 to 2011. The hypotheses of the study were: (i) The performance of the human capital efficiency (HCE) of a bank, do not positively and significantly affect the Growth in Revenue (GR) of the Banks in Nigeria. (ii) The performance of the structural capital efficiency (SCE) of a bank in Nigeria, do not positively and significantly affect the Growth in Revenue (GR) of the Banks in Nigeria. (iii) The performance of the capital employed efficiency (CEE) of a bank in Nigeria, do not positively and significantly affect the Growth in Revenue (GR) of the Banks in Nigeria. The dependent variables was Growth in Revenue, while the independent variables were the components of Value Added Intellectual Capital {Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and the Capital Employed Efficiency (CEE)}. The multiple regression analysis method was adopted for the test of all the hypotheses. The SPSS statistical software (version 17.0) was used for the data analysis. The results showed that there was positive and significant relationship between components of VAIC and the growth in revenue of the banks in Nigeria (VIAC coefficient = 14.160, R^2_c = 0.87, R^2_t = 0.49, P < 0.05). From the results stated above, it is thus established that indeed there is a positive and significant relationship between intellectual capital and growth in revenue of banks in Nigeria.

Keywords: Intellectual Capital, Human Capital, Structural Capital, Growth in Revenue, Nigeria, VAIC.

INTRODUCTION

The global economy has for the past few decades witnessed gradual transition from industry based environment which has a focus on physical assets such as factories, plants, machines and equipment; to a high technology, information, and innovation based environment, which focuses on the expertise, talents, creativity, skill, dedication and experience of people in the organisation-the organisation's intellectual capital base. The fundamental difference between these two environments lies in the nature of their assets and their effect on Growth in Revenue and other financial performance indices. In the former, the physical assets like plants, machinery, materials, equipment, etc. are of utmost importance and make up the bulk of the organisation's assets and determine its value. While in the latter, knowledge, ability, skills, experience and attitude of workers, assume greater significance. Also before now land, labour and capital (financial and physical) were traditionally considered to be the most valuable assets in economics and as a result, conventional physical assets were seen as the main determinants of the performance of any economic activity (Ahangar 2011).

The fast expansion of science, technology and finally the globalization has altered the pattern and structure of

most business operating systems today. The new operating systems are mainly driven by technology, knowledge, expertise and relations with stakeholders etc which may collectively be described as Intellectual Capital (Ahangar 2011). In the new economic system, which is popularly known as the knowledge economy, intangible or intellectual assets have been recognized as the prominent resource needed for organisational survival and growth. Companies like in banking, software, consulting, finance, hospital, pharmaceutical, accounting and law firms, universities and in fact all higher educational institutions, depend to a considerable extent on their intellectual capital for earning revenues.

Intellectual Capital (IC) can be briefly defined as the knowledge based equity of organisations and has attracted, during the last decade, a significant amount of practical interest (Campisi and Costa, 2008; Petty and Guthrie, 2000). Although the importance of Intellectual Capital (IC) is constantly increasing, many organisations face problems with its management, mostly due to measurement difficulties (Andrikopoulos, 2005; Kim *et al.* 2009, Nazari and Herremans, 2007). The widespread acceptance of Intellectual Capital (IC) as a source of competitive advantage led to the development of appropriate methods of its measurement, since traditional financial tools are not able to capture all of its aspects (Campisi and Costa, 2008; Nazari and Herremans, 2007).

The search for the most appropriate method of measuring Intellectual Capital, led Pulic Ante to develop the most popular method that measures the efficiency of value added by corporate intellectual ability (Value Added Intellectual Coefficient – VAIC) Pulic (1998, 2000a, 2000b). The VAIC method measures the efficiency of three types of inputs: capital employed (physical and financial), human capital, and structural capital (Firer and Williams, 2003; Montequin *et al.* 2006; Public 1998, 2000a, 2000b; Puntilo 2009).

Despite the shift towards human and intellectual capital intensive economy, traditional accounting has continued to focus more on the physical assets in their financial statement to the exclusion of the more important assets- the human assets (Armstrong, 2006). Fortunately, human assets belong to group of assets classified as intangible assets because they represent those innate qualities of people which cannot be seen or touched but which are indispensable for organisational successes and survival. Notwithstanding that there are accounting treatments for acquired intangible assets in the balance sheet, current financial accounting treats human resource related costs as expenses which reduce profit on the income statement only in the current accounting periods, rather than being reported as assets on the balance sheet which provide future benefits. As a consequence of the above, Management is denied of relevant and timely quantitative data, which enables her to take vital decisions regarding her human resources, especially the cost implication of certain decisions. This often results in wrong decisions or no decisions at all concerning workers especially as it affects their welfare and entitlements thereby causing industrial disharmony.

This study therefore investigates the relationship between intellectual capitals and Growth in Revenue of banks in Nigeria with the objective of assessing the degree of relationship between intellectual capital and Growth in Revenue of Nigeria banks. It sets to find out whether intellectual capitals can significantly and positively influence the Growth in Revenue of banks in Nigeria. Specifically, the study set to assess the degree of relationship between the Growth in Revenue of the selected banks and the Value Added Intellectual Coefficient indices, {i.e. Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE)} of the selected banks in Nigeria. The choice of the banking sector is because in every country, the banking sector plays a pivotal role in setting the economy in motion and in its developmental processes. Banks promote growth and success of businesses in both developed and developing countries and Nigerian banks have been noted for favouring graduates with second class honours degree (upper division) in their employment policies thereby giving weight to the fact that it is the intellectual capital that determines increase in revenue in business firms in this century. Also according to Kamath (2007), the banking sector is an ideal area for intellectual capital research because the banking sector is "intellectually" intensive and its employees are (intellectually) more homogeneous than those in other economic sectors. Furthermore, owing to the level of intellectually based transformation programmes and improvements witnessed in the Nigeria banking sector, this research examines the effect of intellectual capitals on Growth in Revenue of banks in Nigeria. The study utilizes the value added intellectual coefficient (VAIC) model to assess the effect and degree of relationship between the VAIC variables and Growth in Revenue among the Nigerian banks. The study also contributes to the body of literature as most of the studies in the area of intellectual capital (IC) are on the developed economies.

The remaining sections of this paper are organized as follows: First, a review of literature is presented. The section discusses the definition of intellectual capital, reviews previous studies and presents the hypotheses. Next, there is a section discussing the research methods adopted in the paper. It is followed by a presentation and discussion of analysis and findings. Finally, the paper ends with a conclusion.

Literature Review and Development of Hypotheses

Definition of Intellectual Capital

Several studies exist in the extant literature on the impact of intellectual capital on financial performance of organisations. Despite these studies, there has not been a unified or common definition of intellectual capital.

Engstrom *et al* (2003) agree that there is no generally agreed definition of intellectual capital. This notwithstanding, some attempts have been made at providing some definitions for intellectual capital. Edvinsson and Malone (1997) define intellectual capital as 'the possession of knowledge, applied experience, organizational technology, customer relations and professional skills that provide a company with a competitive edge in the market'. Ahangar (2011) sees the term intellectual capital to include inventions, ideas, general knowledge, design approaches, computer programs and publications. Intellectual Capital (IC) can be briefly defined as the knowledge based equity of organisations and has attracted, during the last decade, a significant amount of practical interest (Campisi and Costa, 2008; Petty and Guthrie, 2000). Stewart (1997) defines Intellectual Capital as packaged useful knowledge, while Fredriksen (1998), states that intellectual capital can be defined as skills and knowledge acquired by people during their lifetime and which can be used for the production of goods and services. Brooking (1996) in Ismail and Karem (2011), defines intellectual capital as the combined intangible assets which enable the company to function and see an enterprise as the sum of its tangible assets and intangible assets as expressed in the following formula:

Enterprise = Tangible Assets + Intellectual Capital.

Saint-Onge's, (1996) model developed in the early 1990s divides intellectual capital into three parts: Human capital, Structural capital; and Customer capital. Also Edvinsson (1997) agrees that intellectual capital comprises human capital, structural capital and customer capital. Bontis (2000) adjusts customer capital into relational capital arguing that it not only the customer's contribution that affects intellectual capital but the whole lot of relations with customers, suppliers, shareholders and other partners. Tseng and Goo (2005) categorized intellectual capital (IC) framework in term of human capital, organizational capital, innovation capital and relationship capital. Therefore following from the above arguments, intellectual capital is expressed mathematically as:

Intellectual Capital = Human Capital + Structural Capital + Relational Capital.

Furthermore, human capital has also been recognised as one of the key determinants of growth today (OECD, 2001). This applies especially to modern economies such as Switzerland, United States of America, China, and Japan etc as companies with a large share of unskilled labour have moved to other countries of the world as a consequence of their comparative intellectual capital advantage (Polasek *et al*, 2011). According to Ahangar (2011), human capital is recognized as the largest and the most important intangible asset in an organization which ultimately provides the goods and/or services that customers require or the solutions to their problems. It includes the collective knowledge, competency, experience, skills and talents of people within an organization. It also includes an organization's creative capacity and its ability to be innovative. Although investment in human capital is growing, there is still no standard measure of its effectiveness in companies' balance sheets. Structural capital is the supportive infrastructure for human capital. It is the capital which remains in the factory or office when the employees leave at the end of the day. It includes organizational ability, processes, data and patents. Unlike human capital, it is company's' property and can be traded, reproduced and shared by, and within, the organization (Ahangar, 2011). Relational capital is a company's relationship with its customers and with its network of suppliers, strategic partners and shareholders. These elements of intellectual capital (IC) are summarized in the definition of CIMA (2001) "IC is the possession of knowledge and experience, professional knowledge and skill, good relationships, and technological capacities, which when applied will give organizations competitive advantage".

From the above definitions, it is clear that intellectual capital is an important asset which has not been fully recognized and reported in financial statements but contributes significantly to improved financial performance and transformation of organisations.

Importance of measuring Intellectual Capital

A review of other research papers that studied Intellectual Capital measurement related issues, found five generic reasons as the purpose of measuring Intellectual Capital (Marr et al 2003):

• to help organizations formulate their strategy

• to evaluate strategy execution

• to assist in the firm's diversification and expansion decisions

• for use as a basis for management compensation

• to communicate with external shareholders

The first three of these purposes relate to internal decision making - the purpose is maximizing operating performance for generating revenues at the lowest cost and the sustainability of supplier and customer relations and market share. The fourth point relates to the executive incentive scheme and the fifth relates to signaling motivations to external stakeholders. There are various other studies that have concluded likewise that Intellectual Capital measurement is necessary and beneficial for both efficient internal governance and succinct external communications. If the primary objective of all for-profit companies is to effectively manage their future cash flows, then they need to manage the ultimate drivers of these cash flows – the intangible assets. Since

one cannot manage what one cannot measure, their measurement becomes quite important, if not absolutely necessary. A lot of authors and scholars have made serious inquest into the issue of intellectual capital measurement.

Intellectual Capital (IC) and financial performance

There are so many methods available to measure the success of physical capital and assess its impact on financial performance. For measuring the effectiveness or efficiency of the use of the physical capital the well known conventional tools like profit, return on investments (ROI), return on equity (ROE), and return on assets (ROA) can be used, but these are considered to be ineffective for measuring the performance of intellectual capital (Santanu and Amitava, 2009). ROI and ROA and growth rate were adopted as the measure of financial performance (Andrzej and Marian, 2009). Tan *et al* (2007) have reported a positive association between intellectual capital of firms and their financial performances. The study of Riahi-Belkaoui (2003) found a positive relationship between Intellectual Capital (IC) and financial performance, while Bontis *et al* (2000) concluded that, regardless of industry, the development of structural capital has a positive impact on business performance. On the other hand, Firer and Williams (2003) examined the relationship between IC and traditional measures of firm performance (ROA, ROE) and failed to find any relationship, while Chen *et al* (2005), using the same methodology, concluded that IC has an significant impact on profitability. Despite these various studies, no one has studied the impact of IC on the revenue growth of financial institutions in developing nations like Nigeria. Hence this present study centers on the relationship between IC and growth in revenue of banks in Nigeria.

Intellectual Capital and Growth in Revenue

According to Patton (2007), the productivity and growth in revenue of a firm lie more on the firm's intellectual capital and system capabilities than on its physical assets. Bontis (2001) argues that leveraging knowledge assets is the key to a firm's prosperity. Based on these studies, therefore, it may be argued that a firm with higher intellectual capital performance is expected to experience higher productivity and thereby higher growth in revenue. Thus, in this paper, the researcher predicts a negative and insignificant relationship of the intellectual capital performance and growth in revenue of banks in Nigeria. Consequently, it is hypothesized as:

H$_1$: The performance of the value added intellectual coefficient indices (HCE, SCE, CEE) of banks, do not positively and significantly affect the Growth in Revenue (GR) of the Banks in Nigeria.

The theoretical positive effect of VAIC and Growth in Revenue (GR) of banks is supported by several studies such as Pulic (1998) in Austria, Pulic (2002) in Croatia, Goh (2005) in Malaysia, Mavridis (2004) in Japan, Mavridis and Kyrmizoglou, (2005) in Greece, and Kamath (2007) in India. As VAIC is composed of the tangible resources efficiency (capital employed efficiency) and IC efficiency (human capital efficiency and structural capital efficiency), this study subsequently tested the following hypotheses:

H$_2$: The performance of the human capital efficiency (HCE) of a bank, do not positively and Significantly affect the Growth in Revenue (GR) of the Banks in Nigeria

H$_3$: The performance of the structural capital efficiency (SCE) of a bank in Nigeria, do not Positively and significantly affect the Growth in Revenue (GR) of the Banks in Nigeria.

H$_4$: The performance of the capital employed efficiency (CEE) of a bank in Nigeria, do not positively and significantly affect the Growth in Revenue (GR) of the Banks in Nigeria.

METHODOLOGY

This section of the paper first identifies and describes the proxies used to represent both the dependent, independent and control variables. The regression equation is outlined at the latter part of the section. Data were computed from the annual report and accounts of the banks of study for a period of twelve years (2000-2011).

Description of the Dependent Variable

Due to the relative importance of intellectual capital in organizational productivity, the Growth in Revenue (GR) is the dependent variable adopted in this paper.

Growth in Revenue: Growth in Revenue measures the changes in firm's current year's sales over the previous year's sales. Increase in revenue signals the firm's growth prospect (Chen, Cheng and Hwang, 2005; Najibullah, 2005). It is calculated as:

GR= (a particular year's revenue – the preceding year's revenue)/ the preceding year's revenue *100/1

Description of the Independent Variables

The Value Added Intellectual Co-efficient (VAIC) methodology developed by Ante Pulic in 1998 formed the underlying measurement basis for the independent variable in this study. It made use of three independent coefficients- Capital Employed Efficiency, Human Capital Efficiency, and Structural Capital Efficiency. In his words, Pulic (1998) opines that VAIC is an analytical procedure designed to enable management, shareholders and other relevant stakeholders to effectively monitor and evaluate the efficiency of Value Added by a firm's total resources and each major resource component. VAIC is a composite sum of two major indicators these are:

(1) 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.

(2) Intellectual Capital Efficiency (ICE) – indicator of value added efficiency of company's Intellectual Capital base. Intellectual Capital Efficiency is composed of two other variables as follows:

(a) Human Capital Efficiency (HCE) – indicator of value added efficiency of human capital. Total salary and wage costs are an indicators of a firm's human capital (HC) and

(b) Structural Capital Efficiency (SCE) – indicator of value added efficiency of structural capital. The two sub-components of VAIC form the independent variables in this study.

Equation (1) formalizes the VAIC relationship algebraically:

VAIC = CEE + HCE + SCE--------------------------------- [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 bank and

 SCE = structural capital efficiency of the banks.

VA = Value Added by each year for 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 and SCE 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).

Pulic (1998) further states that CEE is the ratio of total VA divided by the total amount of capital Employed (CE) where capital employed is defined as the book value of a firm's net assets.

Equation (3) presents the CEE relationship algebraically:

CEE = VA/CE --- Equation (3)

Where: CEE = capital employed efficiency coefficient of the banks,

          VA = VA of the banks; and

          CE = book value of the net assets of the banks.

Consistent with views of other leading Intellectual Capital researchers (for example,

Edvinsson, 1997; Sveiby, 2001), Pulic (1998) argues total salary and wage costs are an indicator of a firm's human capital (HC).

HCE, therefore, is calculated as the ratio of total VA divided by the total salary and wages spent by the firm on its employees.

 Equation (4) shows this relationship algebraically as follows:

HCE = VA/HC --- Equation (4)

Where: HCE = human capital efficiency coefficient of the banks,

          VA = VA of the banks. and

          HC = total salary and wage costs of the banks.

In order to calculate SCE, it is first necessary to determine the value of a firm's structural capital (SC). Pulic (1998) proposes a firm's total VA less its human capital is an appropriate proxy of a firm's SC. That is:

SC = VA – HC --- [Equation (5)]

Where: SC = Structural capital of the banks,

        VA = VA of the banks and

          HC = total salary and wage expenditure of the banks.

Based on prior empirical research findings, Pulic (1998) argues that there is a proportionate inverse relationship between HC and SC in the value creation process attributable to the entire Intellectual Capital base, the less Human Capital participates in value creation; the more Structural Capital is involved. Consequently, Pulic (1998) argues the formula for calculating SCE differed to that for CEE and HCE respectively. Specifically, Pulic (1998) states SCE is the ratio of a firm's SC divided by the total VA. This relationship is shown in Equation (6):

SCE = SC/ VA -- [Equation (6)]

Where: SCE = structural capital efficiency coefficient VA of the banks,

        SC = Structural capital of the banks; and

        VA = VA of the banks.

Recently, VAIC method gain popularity among researchers to measure intellectual ability of companies.

Schneider (1999) supports the adoption of this technique as an effective method of measuring intellectual capital efficiency because:

(a) VAIC places an emphasis on the value of employees, a key component of intellectual capital;

(b) VAIC enabled the collection of evidence of intellectual capital leverage to key success processes;

(c) VAIC was easy to calculate using information already accounted for by a firm and reported in annual reports thus minimizing any additional costs to the preparer and stakeholder;

(d) The methodology used in the calculation of VAIC is relative straight forward that enable greater understanding.

Control Variables

In order to identify the specific effect of the value added intellectual coefficient indices (VAIC) on the financial performance of the selected banks, the researcher controlled for the effect of financial leverage, physical capital intensity and asset turnover. Studies along this line show that financial leverage, physical capital intensity and asset turnover co-vary with the indices value added intellectual coefficient (Firer and Stainbank, 2003; Firer and Williams, 2003; Riahi- Belkaoui, 2003). For the purpose of empirical analysis, the study used multiple regressions as the underlying statistical tests. In conducting the regression analysis, the following control variables as already mentioned were included:

Leverage (Lev): -Financial leverage and debt structure as measured by total debt divided by book value of total assets is used to control for the impact of debt servicing on corporate performance and wealth creation (Riahi-Belkaoui, 2003).

Physical Capital intensity (PC): Physical capital intensity as measured by a ratio of a company's fixed assets to its total assets (Firer and Stainbank, 2003; Firer and Williams, 2003) is used to control for the impact of fixed assets on corporate performance. The assumption is that company's fixed assets have significant impact on company's financial performance.

Assets Turnover ratio (ATO): It is the ratio of total turnover to total assets. This ratio is used to control for the impact of total assets on corporate performance.

Computing the Multiple Regression Analyses

First, values of critical indices in the measurement of intellectual capitals and that of Growth in Revenue (GR) of the six Nigerian banks obtained from Nigeria Stock Exchange were calculated from figures extracted from the published annual reports and accounts of these banks. Secondly the computed data were further subjected to multiple regression analysis. In analyzing the computed data for the variables involved in the study, it was necessary to employ four functional models of multiple regressions in order to determine and select the model that best fitted the analysis. Thus the four multiple regression models employed in the analysis include the linear, semi log, double log and exponential regression models. They are implicitly expressed as follows:

a) Linear regression model:

Growth in Revenue (GR) = B_0 + B_1 (HCE) + B_2 (SCE) + B_3 (CEE) + B_4 (PC) + B_5 (DER) + B_6 (ATO) + E ……………………….…………….………..1

b) Semi log regression model:

Growth in Revenue (GR) = LogB_0 + LogB_1(HCE) + LogB_2(SCE) + LogB_3(CEE) + LogB_4(PC) + LogB_5(DER) + LogB_6(ATO) + E 2

c) Double log regression model:

Log Growth in Revenue (GR) = LogB_0 + LogB_1(HCE) + LogB_2(SCE) + LogB_3(CEE) + LogB_4(PC) + LogB_5(DER) + LogB_6(ATO) + E.....……....…3

d) Exponential regression model:

Log Growth in Revenue (GR) = B_0 + B_1 (HCE) + B_2 (SCE) + B_3 (CEE) + B_4 (PC) + B_5 (DER) + B_6 (ATO) + E...………………………………… ….4

After obtaining the results of the four functional multiple regression models, decisions were therefore taken on which among them should be chosen as the best fit model in the analysis. The choice models were then used in the interpretation of the results. Decision and choice of the best fit model were fundamentally based on the following: a) the one with highest number of significant variables b) value and significance of F-ratio which measures the fitness of a model in using the independent variables to explain the dependent variable c) the magnitude, signs and significance of the coefficient of multiple determination (R^2). Although decisions on the choice of models were based mostly on ones with highest number significant variables, result of the analysis must necessarily show significant F-ratio. The coefficients of multiple determination (R^2) were employed in the study to quantify extent of variation in the dependent variable (Growth in Revenue) caused by the explanatory (independent) variables considered in the study. Furthermore, the analysis were conducted at 1%, 5% and 10% levels of significance respectively denoted as ***, ** and * signs against the coefficient values in the result tables presented.

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ANALYSIS AND INTERPRETATION

As already stated above, the study adopted the four forms of multiple regression analysis for the conduct of the statistical tests and the results are presented in table 1 below for the combined values of all the banks studied. Also in table 2, the summary of the results of the individual banks are presented.

Table1: Multiple Regression Analysis showing the relationship between GR and HCE, SCE, CEE, PC, DER and, ATO in all the Banks considered in the study.

Variables	Linear	Semi – log	Double –log	Exponential
Constant	-2.374 (1.140)	1.222 (0.381)	1.186*** (6.259)	14.160 (0.550)
HCE	-3.176 (-0.945)	0.201 (1.059)	-0.241** (-2.203)	-14.938 (-1.005)
SCE	-10.570** (-2.398)	-0.504* (-1.896)	0.207* (1.877)	24.944 (1.663)
CEE	5.286 (0.853)	1.171 (3.007)	0.118*** (2.765)	11.176* (1.926)
VAIC	4.194 (1.217)	-0.002 (-0.005)	0.398*** (2.931)	45.313** (2,457)
DER	-26.093 (-0.366)	2.546 (0.683)	-1.313*** (-3.270)	38.284 (0.702)
PC	1.531 (0.899)	0.117 (1.308)	-0.249*** (-3.885)	17.836** (2.047)
ATO	-3.879*** (-2.977)	-0.303 (-3.857)	0.178*** (2.836)	-29.526*** (-3.468)
R^2	0.453	0.423	0.806	0.871
R-adjusted	0.363	0.333	0.778	0.658
F-statistics	5.805***	4.712***	2.046***	11.118***

NB:1. **GR** $=B_O+B_1(HCE)+B_2(SCE)+B_3(CEE)+B_4(PC)+B_5(DER)+B_6(ATO)+E$;

    *2. Also, 1%, 5%, 10% levels of significance are represented by ***; ** and * respectively*

    3. Values in brackets are coefficients while those outside brackets are t-values of the variables

    4. DER, PC and ATO are not considered in the interpretation because they are control variables

The Results in Table 1 above show the multiple regression analysis for the variables influencing the Growth in Revenue (GR) in the six banks considered in this study. The Exponential functional form of multiple regressions was chosen in this consideration because of combined advantage of high R square of 0.871 as well as highest number of strong significant variables. The model also showed a very significant F-ratio (11.118***) value which indicated that the choice model fitted the analysis. From the R^2 value (0.871) it is deduced that 87.1% of variations in the Growth in Revenue (GR) of the banks were accounted for by the independent variables included in the study. Specifically, such variables like CEE, VAIC, DER, PC, and ATO have strong significant and positive effect on Growth in Revenue (GR) at 1% level of significance. On the hand, HCE, SCE, showed significant effect on Growth in Revenue (GR) at 5% and 10% respectively. The effect of the above results is that an increase in the values of SCE, CEE, VAIC, DER, PC, and ATO will bring about corresponding increase in the value of Growth in Revenue (GR) of the banks. However, the results also showed that HCE has a negative relationship with Growth in Revenue (GR) which implies that increases in the values of HCE will result in a decrease in the values of Growth in Revenue (GR) of banks studied. The implication of this is that HCE alone cannot guarantee increase in Growth in Revenue (GR) of the banks. It shall require the combination of the other variables such as other types of assets in order to achieve the desired objective.

Furthermore, a closer look at the result of the analysis of the individual banks showed divergent situations. The results of multiple regressions in table 2 below showed the effect of the value added intellectual capital variables on the Growth in Revenue (GR), of the individual banks studied- Diamond Bank Plc, ECO Bank Plc, UBA, Union Bank Plc, Zenith Bank Plc as well as First Bank Plc for a period of twelve years (from 2000 to 2011).

Table2. Summary of results of multiple regression analysis of relation between Intellectual Capital Indices (HCE, SCE, CEE) and Growth in Revenue (GR) of Banks in Nigeria

	DIAMOND BANK	ECO BANK	UBA BANK	UNION BANK	ZENITH BANK	FIRST BANK	DECISION
HCE	1.034 (1.044)	-11.824 (-2.019)	6.284 (1.574)	8.840 (0.707)	0.583 (1.599)	1.204 (3.172)	Accept H_1
SCE	-3.336 (-1.593)	8.759 (1.738)	49.744 (1.101)	-0.034** (-3.738)	-15.341 (-1.330)	-0.139 (-0.160)	Accept H_1
CEE	0.031** (0.370)	0.383 (0.395)	9.447 (0.548)	-13.302 (-0.665)	0.355 (0.657)	0.469 (0.878)	Accept H_1
R^2	0.557	0.864	0.831	0.831	0.851	0.989	
Regression model	Double log	Double log	Linear	Exponential	Semi log	Double log	

NB:1. GR =B_O+B_1(HCE)+B_2(SCE)+B_3(CEE)+B_4(PC)+B_5(DER)+B_6(ATO)+E;

    *2. Also, 1%, 5%, 10% levels of significance are represented by   ***; ** and * respectively*

    3. Values in brackets are coefficients while those outside brackets are t-values of the variables

    4. DER, PC and ATO are not considered in the interpretation because they are control variables

The summary of the multiple regression analysis to show the effect of the value added intellectual coefficient indices on Growth in Revenue (GR) of the selected individual banks are presented in table 2 above. The results highlighted that while some variables indicated positive and significant relationship, others showed either negative but insignificant relationship. In Diamond bank plc, the R^2 of 0.557 shows that the variations in the Growth in Revenue were accounted for by the value added intellectual coefficient indices (HCE, SCE, and CEE). While HCE and CEE maintained positive and significant effect at 5% and 1% levels respectively, the SCE show an insignificant negative effect at 10% level. Similarly, in UBA plc, Union bank plc, Zenith and First bank plc, HCE maintained positive and significant effect on Growth in Revenue in each of those banks. Also, the CEE in three of the banks showed significant negative effect on Growth in Revenue. While the CEE in UBA indicated positive effect on the EP. Furthermore, all the banks under study show very high correlation ranging from 55.7% to 98.9% as can be seen in table 2 above. This is an indication that that the variations in the Growth in Revenue (GR) were accounted for by the value added intellectual coefficient indices (HCE, SCE, and CEE).

Also considering the fact that in all the banks, the components of Value Added Intellectual Coefficient (VAIC) appear to have high relationship with Growth in Revenue in these banks; the regression analyses show that the relationships are significant. In view of this, the null hypothesis that there is no significant and positive relationship between the components of Value Added Intellectual Coefficient (VAIC) and the Growth in Revenue (GR) of the banks in Nigeria is rejected. While the alternate hypothesis that there is significant and positive relationship between the components of Value Added Intellectual Coefficient (VAIC) and the Growth in Revenue (GR) of the banks in Nigeria is hereby accepted. This implies that the value added intellectual coefficient indices of banks in Nigeria maintain positive and significant effect on the Growth in Revenue (GR) of the banks in Nigeria. The implication of this is that the independent variables (HCE, SCE, and CEE) have had direct observable effects on the growth in Revenue of banks in Nigeria and that when these assets are properly and effectively managed, it will result in increased revenue of the banks in Nigeria.

CONCLUSIONS & RECOMMENDATIONS

This current study investigated the relationship between intellectual capital and growth in revenue of deposit money banks operating in Nigeria. Specifically, the study appraised the degree of relationship existing between the intellectual capitals and the growth in revenue of the banks. It tried to find out if intellectual capital can explain an aspect of a bank's financial performance in developing economies with a focus on the growth in revenue among Nigeria bank. The study adopted the Value Added Intellectual Coefficient (VAIC) approach. Hypotheses were formulated for the study and it dealt with the effect of the different aspects of intellectual capital on the growth in revenue of deposit money banks in Nigeria. In respect of the hypotheses, the results as shown in table 1 showed the analysis of the different effects of intellectual capitals (HCE, SCE and CEE) on the growth in revenue of deposit money banks in Nigeria for the combined values of all the selected banks in Nigeria. While table 2 showed the summary of the results as it affected the individual banks studied. From the analyses and interpretations, it is discovered that both Human capital and Capital employed had positive and significant effect on the growth in revenue of deposit money banks in Nigeria. It is therefore recommended that adequate attention should be paid on the bank's human capital as the most important asset to the banks. Constant and regular training of employees is also recommended because it is established that regular training programmes

will certainly enhance and continue to improve on the employee performances.

Following from the discussions above, it is considered that since Human Capital and Structural Capital make up Intellectual Capital; it implies that there is a strong significant and positive effect of Intellectual Capital on the growth in revenue of deposit money banks in Nigeria. This is of special importance to the management of banks in Nigeria and entire service industry; that should adequate working environment be created for workers, with good welfare package, and good training programmes, the banks are bound to continue to flourish.

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