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Effect of Intellectual Capitals on Employee Productivity of Banks in Developing Economies: The Nigeria Experience

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 recent times, a new high technology, information, and innovation based environment has gradually taken the centre stage in the global economy particularly in the banking sector. The Nigeria banking sector has responded appropriately to the introduction of these new technologies and innovations. Under this new dispensation, knowledge, ability, skills, experience and attitude of workers, assume greater significance even as organizations use intellectual capital as a critical resource to enhance their performances. Service firms as well as manufacturing organisations use intellectual capital with their physical assets to sharpen their competitive edge while 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 intellectual capital should have positive effect on Employee Productivity. Empirical records of studies on this effect in some developed nations showed divergent views. Unfortunately, no empirical records on the effect of intellectual capital and Employee Productivity in the Nigeria banking sector exist. This study therefore uses the Value Added Intellectual Coefficient (VAIC) model to investigate the effect of the Intellectual Capital indices (i.e. Human Capital Efficiency, Structural Capital Efficiency and the Capital Employed Efficiency) on the Employee Productivity of banks in Nigeria. The data were collected from the annual reports of six banks and analysis was conducted using longitudinal time series data generated from the annual reports and accounts of the selected banks in Nigeria spanning from year 2000 to 2011. The multiple regression analysis method was adopted for the test of the hypothesis. The SPSS statistical software (version 17.0) was used for the data analysis. The study showed that there was a positive and significant relationship between components of VAIC and employee productivity of the banks in Nigeria (VIAC coefficient = 1.186, R^2_c = 0.806, R^2_t = 0.49, P < 0.05). From the result stated above, it is thus established that indeed intellectual capital has positive and significant effect on Employee Productivity of banks in Nigeria.
Keywords: Intellectual Capital, Human Capital, Structural Capital, Employee Productivity, Nigeria, VAIC.

1.0 Introduction

With the gradual shift of global business world into the knowledge economy, it is becoming increasingly important and obvious to business organisations that to survive in business in this complex and dynamic world, adequate attention must be paid to the intellectual capital base of the firm. Gone are the days when firms focus only on their physical capital with little or no attention to their intellectual capitals and still post huge profits. Competition in business today has become so intense that managers utilize every resource at their disposal to edge others out of business. Intellectual capital has also become an important business resource that organisations can leverage on to gain competitive advantage. Bornemann et al. (1999) discover that enterprises, which have managed their intellectual capital better, had achieved stronger competitive advantage than the other enterprises. Iswati and Anshori (2007) opine that human being has become the central attention in the twentieth century hence intellectual capital research now is not only paramount but also timely. Furthermore, the OECD (2001) also opines that human capital, which is an integral part of intellectual capital, has been recognized as one of the key determinants of growth today in any business enterprise. While Bornemann et al. (1999) concludes that companies which had strengthened their own intellectual capital management, compared to the others had performed better. Intellectual capital is one of the main factors related to the performance and long-term profitability of knowledge-based economy (Huu and Fang, 2008).

Following from the above, the banking sector in Nigeria has recognized this fact and has taken some drastic action with respect to enhancing its intellectual capital base. For example, banks in Nigeria nowadays engage mostly university graduates, who possess a minimum of second class honors degree (upper division) in their employment policies, thereby giving credence to the fact that intellectual capital significantly affects their performance. This action has really paid off as the Nigeria banking sector has witnessed huge transformation in the last few years. Customers of banks now receive quick and improved services from their banks. Also, the use of automated teller machines (ATMs) and internet banking facilities have decongested the banking halls of most banks in Nigeria thereby saving a lot of man hours. Furthermore, customers can also obtain bank services from

the comfort of their homes. In addition to the above, the banking sector has for so many years dominated trading at the Nigeria stock exchange.

Also, before the year 2000, the three strongest and most popular banks in Nigeria were: the First bank of Nigeria (FBN), Union bank of Nigeria (UBN) and United Bank for Africa (UBA). The volume of their transactions as well as their assets and customer bases were not only very high but also very strong. With the emergence and introduction of modern technologies in banking, which depended heavily on their intellectual capital base, these trio were generally classified as old generation banks while the banks that immediately embraced the modern technologies, such as Zenith bank Plc, Eco bank Plc, Diamond bank Plc, etc., were classified as the new generation banks. Even then, the new generation banks could only make minor impact in the economy and at the Nigeria Stock Exchange as these older banks dominated trading and other activities at the exchange. Most people then preferred to bank and carry out their transactions with these old generation banks because of these attributes. Today, with the coming of these new technologies, the trend has been altered. While some of the old generation banks still record higher book values of their physical assets, most of the new generation banks post higher and better financial performance figures and better services than the old generation banks owing to the intellectually based innovations introduced by these new generation banks. Consequently, people now prefer to bank with the new generation banks and as a result, the customer bases of the older banks have dropped significantly. Furthermore, even at the Nigeria Stock Exchange (NSE), the rate of stock turnover of these new generation banks as well as their market prices has consistently been higher than those of the old generation banks. In fact these new generation banks today dominate activities at the Nigeria Stock Exchange. An explanation to what has caused this change in trend has to be made empirically; hence this research sets to examine the effect of intellectual capital on employee productivity of banks in Nigeria.

Again, the banking sector in any country 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. 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, most of the researches on intellectual capitals centered on developed economies without any yet on counties like Nigeria. Also most of the researches on intellectual capital measured effect of IC on profitability. Not many of such studies have probed the effect of IC on employee productivity particularly in the developing countries.

Owing to the level of intellectually based transformation programmes and improvements witnessed in the Nigeria banking sector, this current research examines the effect of intellectual capital on employee productivity 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 employee productivity 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. Empirical evidence of the understanding and development of intellectual capital (IC) concepts in developing economies is still in its infant stage (Firer and Williams, 2003) and since developing economies make up greater number of the global economy and also contribute significantly to world prosperity and stability, it is important to empirically establish the development and effect of intellectual capital on employee productivity in these 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 this study. It is followed by a presentation and discussion of the findings. Finally, the paper ends with a conclusion.

2.0 Review of Related Literature

2.1 Definition of Intellectual Capital

Various studies have made attempt at providing one acceptable definition for intellectual capital but have not yet succeeded and as such there is no generally agreed definition of intellectual capital (Engstrom et al 2003). However, some definitions are noted here: 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. 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. 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.

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.

2.2 Measurement of Intellectual Capital

The measurement of intangibles and/or intellectual capital has always been a difficult challenge for the statistical system. The growth of the "new economy" – the knowledge economy, has made responding to this challenge even more urgent: the need to understand how such inputs affect the value chain of employee productivity, growth, and firm value now surpasses the need to measure the contribution of bricks, mortar, and equipment and other physical assets. Yet the changes that have brought the new economy into existence have also highlighted the need for improvements to traditional measures of inputs and outputs especially for human capital (Haltiwanger and Jarmin 2000). Finding new measures of human capital that are both quantifiable and available for a sample large enough for use in official economic statistics is a formidable challenge.

2.2.1 Why should Intellectual Capital be measured?

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. Some of them are reviewed here:

2.2.2The Scandinavian Insurance Company

The Scandinavian insurance company, Skandia AFS, is the pioneer in measuring and reporting intellectual capital. The company has been providing intellectual capital information in a supplementary statement to its Annual Reports since 1994. The supplementary statement has been developed to bring out the company's human focus, current customer focus and its structural process focus. In addition, the future development related information is provided in addition to the historical financial data. However the various approaches for measuring Intellectual Capital are categorized into four measurement approaches by Sveiby (2007). The categories are an extension of the classifications suggested by Luthy (1998) and Williams (2000). These are:

(i). Direct Intellectual Capital methods (DIC): This method estimates the monetary value of intangible assets by identifying its various components. Once these components are identified, they can be directly evaluated, either individually or as an aggregated. This method includes the following examples: The Value Explorer, Intellectual Asset Valuation, Total Value Creation (TVC), Accounting for the future (AFTF) etc.

(ii). Market Capitalization Methods (MCM): This method calculates the difference between a company's market capitalisation and its book value as the value of its intellectual capital or intangible assets. Markets to Book Value, Tobin's Q are examples of this method.

(iii). Return on Assets methods (ROA): It is the capitalisation of industry above-average earnings by the company's average cost of capital. Industry above average earnings is the multiplication of company's excess ROA over industry ROA with its average tangible assets. This method includes knowledge Capital Earnings, Economic Value Added (EVA), Calculated Intangible Value (CIV), Value Added Intellectual Coefficient (VAIC) etc.

(iv). Scorecard Methods (SC): The various components of intangible assets or intellectual capital are identified and indicators and indices are generated and reported in scorecards or as graphs. Examples of this method are National Intellectual Capital Index (NICI), IC Rating, ICdVAL, Value Chain Scoreboard etc.

2.3 Intellectual Capital and Employee Productivity

According to Patton (2007), the productivity of a firm lies more on its 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 employee productivity. Thus, in this paper, the researcher predicts a negative and insignificant effect of the intellectual capital performance on employee productivity of banks in Nigeria. Consequently, it is hypothesized as follows:

H_1: The performance of the value added intellectual coefficient indices (HCE, SCE, CEE) of a bank in Nigeria, do not positively and significantly affect the employee productivity of the Banks.

The theoretical positive effect of VAIC and employee productivity of banks is supported by several studies such as Pulic (1997) 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 both the tangible resources efficiency (capital employed efficiency) and IC efficiency (human capital efficiency and structural capital efficiency), we subsequently tested the following hypotheses:

$H_{2:}$ The performance of the human capital efficiency (HCE) of a bank in Nigeria, do not positively and significantly affect the employee productivity of the Banks.

$H_{3:}$ The performance of the structural capital efficiency (SCE) of a bank in Nigeria, do not positively and significantly affect the employee productivity of the Banks.

$H_{4:}$ The performance of the capital employed efficiency (CEE) of a bank in Nigeria, do not positively and significantly affect the employee productivity of the Banks.

3.0 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 of the banks of study for a period of twelve years (2000-2011).

3.1 Description of the Dependent Variable

Due to the relative importance of intellectual capital in organizational productivity, the employee productivity is the dependent variable adopted in this paper.

3.1.1 Employee Productivity (log EP): Employee Productivity is a measure for the net revenue per employee, which reflects employees' productive capability (Chen, Cheng and Hwang, 2005; Najibullah, 2005). It is calculated as follows: EP = Total Revenue for the period/ number of employees. In the multiple regression analysis we used natural log of EP (LEP).

3.1.2 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.

3.1.3 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:

3.1.3a 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).

3.1.3b 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.

3.1.3c 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.

3.2 Computing the Multiple Regression Analyses

First, values of critical indices in the measurement of intellectual capitals and that of employee productivity 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:

Employee Productivity= Bo +B1 (HCE) +B2 (SCE) +B3 (CEE) + B4 (PC) + B5 (DER) + B6 (ATO) + Ui ……..……..……..1

b) Semi log regression model:

Employee Productivity= LogBo + LogB1(HCE) + LogB2(SCE) + LogB3(CEE) + LogB4(PC) + LogB5(DER) + LogB6(ATO) + ….....…2

c) Double log regression model:

Log Employee Productivity= LogBo + LogB1(HCE)+ LogB2(SCE) + LogB3(CEE) + LogB4(PC) + LogB5(DER) + LogB6(ATO) + ...….....…3

d) Exponential regression model:

Log Employee Profitability= Bo + B1 (HCE) + B2 (SCE) + B3 (CEE) + B4 (PC) + B5 (DER) + B6 (ATO) + Ui...…….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 (employee productivity) 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.

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.

Table 1: Multiple Regression Analysis showing the relationship between Log EP and HCE, SCE, CEE, PC, DER and, ATO in all the Banks considered in the study

Variables	Linear	Semi –log	Double –log	Exponential
Constant	15.977*** (6.097)	3.486*** (7.386)	1.186*** (6.259)	2.840** (2.669)
HCE	-0.232 (-1.591)	0.040 (-1.539)	-0.241** (-2.203)	-1.330** (-2.163)
SCE	-0.379* (-1.983)	-0.066* (-1.931)	0.207* (1.877)	1.125* (1.814)
CEE	0.347 (1.290)	0.065 (1.345)	0.118*** (2.765)	0.652*** (2.716)
VAIC	0.001 (0.008)	0.000 (-0.005)	0.398*** (2.931)	2.153*** (2.823)
DER	-13.081*** (-4.230)	-2.283*** (-4.099)	-1.313*** (-3.270)	-7.556*** (-3.351)
PC	-0.220*** (-2.980)	-0.039*** (-2.940)	-0.249*** (-3.885)	-1.383*** (-3.838)
ATO	0.279*** (4.880)	0.050*** (4.892)	0.178*** (2.836)	0.981*** (2.787)
R^2	0.696	0.698	0.806	0.798
R-adjusted	0.655	0.657	0.778	0.770
F-ratio	16.982***	17.150***	29.046***	27.723***

NB:1.Log EP=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 employee productivity (log EP) in the six banks considered in this study. The double log functional form of multiple regression was chosen in this consideration because of combined advantage of high R square of 0.806 as well as highest number of strong significant variables. The model also showed a very significant F-ratio (29.046***) value which indicated that the choice model fitted the analysis. From the R^2 value (0.806) it is deduced that 80.6% of variations in the Log EP 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 strongly significant and positive effect on Log EP at 1% level of significance. On the hand, HCE, SCE, showed significant effect on Log EP 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 Log EP of the banks. However, the results also showed that HCE has a negative relationship with Log EP which implies that increases in the values of HCE will result in a decrease in the values of Log EP of banks studied. The implication of this is that HCE alone cannot guarantee increase in employee productivity of the banks. It shall require the combination of the other variables in order to achieve the desired objective.

Furthermore, a closer look at the result of the analysis of the individual banks showed divergent views. The results of multiple regressions in table 2 below showed the effect of the value added intellectual capital variables on the Log of Employee productivity (Log EP), 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).

Table 2: Summary of results of multiple regression analysis of relation between Intellectual Capital Indices (HCE, SCE, CEE) and Employee Productivity of selected Banks in Nigeria

	DIAMOND BANK Plc	ECO BANK Plc	UBA BANK Plc	UNION BANK Plc	ZENITH BANK Plc	FIRST BANK Plc	DECISION
HCE	0.0564** (3.613)	-0.168 (-1.224)	0.015*** (2.623)	0.008*** (0.205)	0.002*** (0.112)	0.002*** (0.112)	Accept H_1
SCE	-0.097* (-3.323)	0.267 (0.553)	0.076* (1.176)	-0.011*** (-1.382)	-0.120 (-3.123)	-0.020** (-3.123)	Accept H_1
CEE	0.014*** (1.035)	0.067* (2.554)	0.000*** (-0.026)	-0.031** (-0.478)	-0.003*** (-0.127)	-0.003*** (-0.127)	Accept H_1
R^2	0.885	0.708	0.801	0.791	0.989	0.989	
Regression model	Double log	Semi log	Semi log	Semi log	Double log	Double log	

NB:1.Log EP=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 employee productivity 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 0.885 shows that the variations in the employee productivity were accounted for by the value added intellectual coefficient indices (HCE,SCE,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 employee productivity in each of those banks. Also, the CEE in three of the banks showed significant negative effect on employee productivity. While the CEE in UBA indicated positive effect on the EP. Furthermore, all the banks under study show very high correlation ranging from 70.8% to 98.8%. From the above analysis, it is thus established that the alternate hypothesis is accepted, thereby rejecting the null hypothesis. This implies that the value added intellectual coefficient indices of banks in developing economies maintain positive and significant effect on the employee productivity of the banks in those economies.

CONCLUSIONS & RECOMMENDATIONS

This study investigated whether intellectual capital can explain an aspect of a bank's Financial Performance in developing economies with a focus on the Nigeria banking sector. Specifically, the study focused on the investigation into the effect of intellectual capital on employee productivity of selected banks in Nigeria using 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 banks' employee productivity. In respect of the hypotheses, the results as shown in table 1 showed the analysis of the different effects of intellectual capitals on employee productivity 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 employee productivity. 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 Employee Productivity of 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 do well. This opinion is also shared by (Mankiw, et al 1992; Badinger and Tondl 2005, Chen et al., 2005; Edvinsson and Malone, 1997; Lev and Radhakrishnan, 2003; Lev and Zarowin, 1999; Lev, 2001; Ruta, 2009; Yang and Lin, 2009 and Ahangar 2011).

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