

EFFECT OF INTELLECTUAL CAPITAL ON CORPORATE VALUATION OF QUOTED PHARMACEUTICAL FIRMS IN NIGERIA

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ABSTRACT: *This study examined the effect Intellectual Capital(IC) can affect corporate valuation of firms quoted in Nigeria. The study adopted the Panel Research Design as used Time Series and Cross-Sectional Data. Data covered a ten- year period (2004-2013). Simple Random Sampling was employed in selecting firms for this study. Data were sourced from the firms' annual financial statements using content analysis approach. Market valuation data were sourced from the Nigerian Stock Exchange. Intellectual Capital(Independent Variable) was measured using Human Capital Efficiency (HCE), Structural Capital Efficiency(SCE) and Capital Employed Efficiency (CEE). Market to Book Value Ratio(M/BV) and Earnings per Share(EPS). The study adopted the Value Added Intellectual Coefficient (VAIC) Model as developed by Pulic(1998) to examine the effect of Intellectual Capital on firms' values. Multiple Regression Correlation Analysis was used on the data at 5% level of significance. E-View Statistical Tool version 8.0 was used in the analysis. The results reveal that Human Capital Efficiency has a positive and significant effect on Market/Book Value. SCE has a negative and insignificant effect on M/BV; CEE has negative and significant effect on M/BV; positive and insignificant effect on EPS. In view of our findings, the study recommends that companies should invest substantial part of their earnings on human capital via knowledge development as such investments are capable of stimulating the value creation potentials of their staff and can get investors place higher premium on them.*

KEYWORDS: Intellectual Capital, Corporate Valuation, Pharmaceutical Firms, Nigeria

INTRODUCTION

Background of the Study

The accounting profession is currently more than ever being challenged to reinvent itself. This move emanates from the inherent deficiencies of conventional accounting, which has failed to recognize the intangibles/knowledge acquired by organization as non-current assets. Therefore, there is need for a more elaborate platform of financial reporting that could capture knowledge and other Intellectual Capital(IC) Components (Human, Structural and Relational/Customer Capital) in quantitative terms in financial information for informed decision-making. The continuous exclusion of these IC components implies the neglect of the enormous intangible values and investments incurred by firms in the acquisitions and development of intellectual properties.

This practice has aptly culminated in the undervaluation of firms and the often huge gap that often exists between book value and market value of firms. The reward earned by firms through their investment in intellectual properties is often attributed to intellectual capital and this is argued to be a major value creator. Edvinsson & Malone(1997) in Saeed, Farahmand and Khorasani(2013) submit that Intellectual Capital accounts for the enormous gap

between the market value and book value of firms in the knowledge-based and technology-driven industry such as the pharmaceuticals industry and this they therefore attributed the missing value in the financial statements to 'Intellectual Premium' or 'Intellectual Capital'.

Banimahd, Mohammadrezai and Mohammadrezai (2012) submit that knowledge-based economy has emerged in the 1980's due to the investments, creation and use of high-technologies and globalization. Ahangar(2011) posits that the fast expansion of science, technology and globalisation have altered the pattern and structure of production system as the processes are becoming increasingly driven by technology, knowledge, expertise and relationships with stakeholders and that innovation-driven economy could be attributed and described as "Intellectual Capital" (IC).

The IASB through IAS 38 on Intangible Assets and the subsequent IFRS 3 on Business combinations and IAS 36 on Impairment of Assets applied by IFRS adopting countries and the treatment of goodwill, research and development and other identifiable intangible assets all give credence to the need for incorporating Intellectual Capital in financial reporting(Vafaei, Taylor & Ahmed, 2011). Berzkalne & Zelgalve (2014) argue that though intellectual capital and knowledge assets are difficult to discern and quantify, their results will none the less be reflected in the company's greater productivity, efficiency and overall profitability.

Statement of Problem

The justification or otherwise for the place of knowledge also known as intellectual capital in driving the earnings and indeed the other corporate value indices of firms has constituted a challenging academic puzzle in the past few decades. Some scholars have described intellectual capital as being a key driver of corporate value enhancement (Henry, 2013; Berzkalne & Zelgalve, 2014). Yet other submit that intellectual capital provides a platform through which firms enjoy competitive advantage, well and above their contemporaries (Mojtahedi, 2013; Saeed, et al. 2013).Ekwe(2012) found out a statistically strong relationship between the components of intellectual capital and Market to Book Value (M/BV) Ratio.

In contrast to the above submissions, some empirical studies could not establish any statistical relationship between intellectual capital and firms' values. Puntilo (2009) indicate an inverse relationship between intellectual capital as defined by structural capital and M/BV ratio. Zou & Huan(2011) opine that Capital Employed Efficiency and Structural Capital Efficiency(SCE) have a negative correlation with Technical Efficiency while Human Capital Efficiency(HCE) has a positive correlation with Technical Efficiency. Anuonye (2015) argues that IC components are positively but insignificantly related with Earnings per Share (EPS) in Nigeria. This study becomes very imperative, as there exists the obvious gap created by lack of locally groomed study that could serve the peculiar need of pharmaceutical industry and more importantly in an era when knowledge is considered key and fundamental to corporate value creation and hence the justification for this study.

Objectives of the study

The broad objective of this study is to appraise the effect of intellectual capital on market valuation of pharmaceutical firms in Nigeria. The specific objectives of this study are to:

- (i) Determine the effect of Intellectual Capital on Market to Book Value Ratio(M/BV) of firms in Nigeria.
- (ii) Ascertain the effect of Intellectual Capital on Earnings per Share(EPS) of firms in Nigeria.

Research Questions

The following questions will help to address the afore-stated objectives:

- (i) To what extent does Intellectual Capital affect Market to Book Value Ratio (M/BV) of firms in Nigeria?
- (ii) How does Intellectual Capital affect Earning per Share (EPS) of firms in Nigeria?

Research Hypotheses(Null):

The following research hypotheses will guide this study:

- H₀₁:** Intellectual Capital does not significantly affect Market to Book Value Ratio of firms in Nigeria.
- H₀₂:** Intellectual Capital has no significant relationship with Earnings per Share of firms in Nigeria.

REVIEW OF RELATED LITERATURE

Conceptual Framework

2.1.1 Intellectual Capital Defined: Intellectual Capital(IC) has been widely acknowledged as that innate attribute usually acquired by a firm which drives it on the wheel of value creation, value addition and value sustainability. To this end, many definitions have been propounded by different scholars and researchers. The concept of Intellectual Capital generally can be said to have emanated from describing the 'dynamic effects of individuals: the 'Intellect' (Sveiby, 1998).

Intellectual Capital and Firms' Market to Book Value Ratio of Firms: The IASB(2010) in noting the place of IC in the enhancement of firms' market to book value ratio states that the difference between the market value of an entity and the carrying amount of its identifiable net assets may capture a range of factors that affect the value of an entity part of which is intellectual capital. Edvinsson & Malone (1997) also attributed the gap often observed between firm's book and market value as Intellectual Capital(IC) while Maditoni, et al.(2011) argue that a method for determining the intellectual (intangible) assets of a company is to compare market to book value of the firm.

Intellectual Capital and Firms' Earnings per Share: Earnings is profits after tax which is attributed to ordinary shares. Earnings per share explains that earnings which is attributable to one unit of naira invested in the business by a shareholder(Anuonye(2015). Earnings are therefore argued to have been stimulated when components of intellectual capital are judiciously utilized. Brookings (1996) as cited by Sofian, et al.(2011)postulates that 62%

value of companies were formerly represented by physical capital and 38% IC but that the inverse has become the case since 1991.

Intellectual Capital has substantial impact on financial information especially with respect to firms' earnings

METHODOLOGY

Research Design

This study is quantitative based on expo- facto study. It will use Time- Series Research Approach.

Sample Size of the Study

The sample size comprises three companies out of six companies, which were listed on the Nigeria Stock Exchange as at 31st December 2013. (See Appendix 1 for the list of companies studied). The choice of the companies is also collaborated by prior studies (such as Banihmad, et al. 2012; Boujelbene & Affes, 2013 who argue that the impact of IC can be substantial in certain manufacturing sectors like Information and Communication Technology, Pharmaceuticals/ Healthcare.

Sources of Data

This study made use of secondary data sourced from the annual financial statements of the companies and the database of the Nigeria Stock Exchange. Data used for the study covered a ten year period(2004-2013). These data were considered credible since they have been audited and filed with the Securities and Exchange Commission.

The choice of data was also in line with studies of scholars like Pulic(1998) on measurement firms' IC, the Value Added Intellectual Model(VAIC)which were adopted in the studies conducted on IC and firms performance by previous researchers {Anuonye, 2015, Firer and Stainbank, 2003; Berzklane and Zelgalve,2014}.

Model Adoption and Justification

The VAIC(Value Added Intellectual Coefficient Model) as developed and propounded by Pulic(1998) was adopted for this study. The study was used to measure the value added by Intellectual Capital possessed by the various companies being studied. It explains how new values have been created per invested monetary unit resources. VAIC was developed basically as an analytical tool designed to effectively monitor and evaluate the efficiency of Value Added by a company's total resources among each resource components (Pulic,1998).

Variables

The research variables were structured into dependent and independent variables for the purpose of analysis. The dependent variables are M/BV and EPS. The independent variable of this study is the value of Intellectual Capital as depicted by Human Capital (HC), Structural Capital (SC) and Capital Employed.

Dependent Variables: The dependent variables as stated earlier are:

Market to Book Value Ratio:

$$\frac{MV}{BV} \dots \dots \dots (1)$$

Where:

MV= No of shares * Stock price at the year end.

BV= Book value per share

Earnings per Share (EPS):

$$EPS = \frac{PAT - \text{Preference dividend} - \text{minority interest}}{\text{No of Ordinary Shares in Issue}} \dots \dots \dots (2)$$

No of Ordinary Shares in Issue

Independent Variables:

(i)Value Added Intellectual Coefficient: VAIC is the sum of Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE). Thus:

$$VA = W + I + DP + DIV + T + R \dots \dots \dots (1)$$

Where:

VA : Value Added; W: Wages and salaries; I : Interest expenses; DP: Depreciation expenses; DIV: Dividends; T: Corporate taxes and R: Retained profit for the year.

It is calculated by:

$$VAIC = HCE + SCE + CEE \dots \dots \dots (2)$$

Where:

HCE= Human Capital Efficiency

SCE = Structural Capital Efficiency

CEE= Capital Employed Efficiency

(a)Human Capital Efficiency (HCE): This defines the ratio of total value added to total salaries and wages. Human Capital(HC) is interpreted as employee expenses and Human Capital efficiency (HCE) is calculated by dividing VA (added value) with HC (Human Capital).

$$\text{Thus:} \quad VA/HC \dots \dots \dots (1)$$

(b) Structural Capital Efficiency (SCE): This ratio indicates how much of value added was generated by structural capital.

$$\text{Structural Capital Efficiency (SCE) = } \frac{\text{Structural Capital (SC)}}{\text{Value Added (VA)}} \dots \dots \dots (2)$$

(c)Capital Employed Efficiency (CEE): The ratio will be used to calculate the total value added to book value of assets and wages. Capital Employed (CE) will be interpreted as financial capital and capital employed efficiency (CEE) is calculated by dividing VA(value added) with CE(capital employed)

Capital Employed Efficiency(CEE)=Value Added(VA)/Capital Employed.....(5)

ThusSCE=SC/ VA.....(6)

Where: SCE = Structural Capital Efficiency Coefficient Value Added of the firms

SC = Structural Capital of the firms

VA = Value Added of the firms

Decision Rule

The decision will be based on the outcome of VAIC(Value Added Intellectual Coefficient) . If the coefficient is high, it indicates the management has used the firm's resources(HC, SC and CE) efficiently and if it is low it means that management has been inefficient in the use of resources. Inference will be based on a significant level of less than 5% while null hypotheses on 95% level will not be accepted.

Tools for Data Analysis

The data collected were analyzed using basic statistical tool that will provide the descriptive analogies such as mean, median, standard deviation and so on. Multiple Linear Regression was also used to test the hypotheses. Data analyses were done with the aid of E-Views 8.0 Statistical Software.

Model Specification

Multiple Linear Regressions

The study used Multiple Regression and Correlation Coefficient done with the aid of E-Views 8.0 to analyse the data. Multiple regression is adopted because according to Mroverview (2012).

To determine the effects of Intellectual Capital on corporate valuation, the researcher regressed the intellectual capital efficiency coefficients on M/BV and EPS.

VAIC model is adopted for this study as earlier stated. This choice of this model is incified in line with previous studies(e.g. Salman, et al., 2012; Berzklane and Zelgalve, 2014).

The model as specified will be employed in testing the hypotheses 1-2 thus:

$$M/BV_{it} = \beta_0 + \beta_1(HCE) + \beta_2(SCE) + \beta_2(CEE) + \mu \dots\dots\dots(1)$$

$$EPS_{it} = \beta_0 + \beta_1(HCE) + \beta_2(SCE) + \beta_2(CEE) + \mu \dots\dots\dots(2)$$

$$\text{NAPS}_{it} = \beta_0 + \beta_1(\text{HCE}) + \beta_2(\text{SCE}) + \beta_3(\text{CEE}) + \mu \dots\dots\dots(3)$$

RESULTS OF HYPOTHESES TESTED

Table 1: IC on M/BV

Research Variables	Beta Coefficients	Std Error	T- Statistics	P-Value
Constant	-1.479571	1.423640	-1.039287	0.3056
HCE	1.859244	0.758725	2.450484	0.0193***
SCE	-2.224842	1.546462	-1.438666	0.1586
CEE	-0.753767	0.326375	-2.309512	0.0268***
R-squared	0.252797			
Adjusted R ²	0.190531			
F-statistics	4.059903			
Prob (F-statistics)	0.013894			

Source: Researchers' Computations

Table 2: IC and EPS.

Research Variables	Beta Coefficients	Std. Error	T- Statistics	P-Value
Constant	-2.033710	0.947551	-2.146281	0.0387
HCE	0.707645	0.504995	1.401293	0.1697
SCE	0.883169	1.029299	0.858030	0.3966
CEE	0.315736	0.217230	1.453467	0.1548
R-squared	0.359982			
Adjusted R ²	0.306648			
F-statistics	6.749485			
Prob (F-statistics)	0.000995			

Source: Researchers' Computations

Discussion of Results

Table 1 shows that a unit/one naira change in Human Capital(HC), Structural Capital(SC) and Capital Employed(CE) will yield an increase of 1.859244, decrease by 2.224842 and decrease of 0.753767 respectively in M/BV Ratio in sector. Thus:

$$\text{M/BV}_{it} = -1.479571 + 1.859244 - 2.224842 - 0.753767.$$

Again, table 1 show the probability values of ($x_1=0.0193>0.05$);($x_2=0.1589>0.05$);($x_3=0.0268>0.05$).

Table 1 reveals the comprehensive effect of Intellectual Capital on the M/BV Ratio in the sector. HCE had a positive and significant effect on M/BV Ratio at 0.05 level of significance with a p-value of $x_1=0.0193$; SCE had a negative and insignificant with M/BV ratio at 0.05

level of significance. However, CEE shows a negative and significant effect on M/BV ratio at 0.05 level of significance $x_3=0.0268$.

Table 2 shows that a unit/one naira change in the explanatory variables Intellectual Capital as explained by HCE, SCE and CEE will yield an increases thus:

$$EPS_{it} = -0.003532 + 0.707645 + 0.883169 + 0.315736$$

Therefore, the relationship between the EPS of the sector and Intellectual Capital as explained by Human Capital Efficiency(HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) is positive with all the dependent variables respectively.

In Table 2 shows $P(x_1=0.1697>0.05)$; $P(x_2=0.3966>0.05)$ and $P(x_3=0.1548>0.05)$ respectively are greater than the critical P-Value of 0.05.

In view of the results above, the probabilities connected with the model x_1, x_2 , and x_3 were higher than the specified level of significance, that it at $P(x_1=0.1697>0.05)$; $P(x_2=0.3966>0.05)$; and $P(x_3=0.1548>0.05)$, therefore the null hypothesis is accepted and alternate hypothesis is rejected for HCE, SCE and CEE respectively. The result further show that the result of analysis of the relationship between IC components and Earnings per Share. It reveals the comprehensive effect of IC on the Earnings per Share Ratio of the health sector. The study shows that the relationship between IC and EPS in the healthcare industry is positive at 5% level of insignificance. Human Capital, Structural Capital and Capital Employed have p-values of $x_1=0.1697$, $x_2=0.3966$ and $x_3=0.1548$.

R^2 of 36% of the variations in the EPS could be attributed to IC measuring variables of the Sector.

Summary of Findings

The study has examined the relationship between Intellectual Capital and firms' valuation using the pharmaceutical industry in Nigeria. The findings of the study are:

(1) HCE has a positive and insignificant effect on Market to Book Value(M/BV) Ratio. SCE has a negative and insignificant effect on Market to Book Value(M/BV) Ratio while Capital Employed Efficiency(CEE) has a positive and insignificant relationship with Market to Book Value(M/BV) Ratio of firms in the sector in Nigeria.

(2) Human Capital Efficiency has a positive and significant effect on Earnings per Share(EPS). Structural Capital Efficiency(SCE) has a negative and insignificant effect on EPS. CEE has a positive and insignificant on EPS.

Policy Implications of the Study

The policy implication of this study is that firms in the sector must tremendously increase investments in IC to enhance corporate values of M/BV and EPS.

RECOMMENDATIONS

Sequel to the findings, the researchers make the following recommendations:

- a. Since HCE has been shown to be the key driver of value creation especially EPS deliberate efforts should be made to grow IC of firms by first recruiting very competent staff, train and motivate them.. Companies must strategically and deliberately train and retain staff for a long time to avoid losing the intellectual assets possessed by them, which could stimulate better Earnings per Share.
- b. Firms should invest in education and relevant in programmes that can help they increase in their structural capital by harnessing information technology. Again, as earnings is one foremost corporate value index, the necessary IC of Human Capital must be provided while unnecessary costs are eliminated to increase their earnings.

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APPENDIX 1:

Firms Studied

May and Baker Plc

Glaxo Smithkline Plc

Evan Healthcare Plc