

**INTELLECTUAL CAPITAL AND MARKET VALUE ADDED OF LISTED INSURANCE COMPANIES
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Abstract

This study ascertained the effect of Intellectual Capital (IC) on Market Value Added (MVA) of listed Insurance companies in Nigeria for the period of ten years covering from 2012-2021. This research relies on an empirical model using Value Added Intellectual Coefficient (VAIC™) to measure IC performance through predictive analysis. VAIC™ has three major components Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE). Using data drawn from the sample size of fifteen (15) listed insurance companies annual reports and accounts, this study employed inferential statistics using Pearson Correlation coefficient and Panel Least Square (PLS) regression models to examine the relationship between Intellectual Capital and firms' Market Value Added via E-Views 10.0 statistical software. *Ex-Post facto* research design was adopted. The empirical results revealed that Human Capital Efficiency (HCE) has a significant positive relationship with Market Value Added at (P < 0.05), Structural Capital Efficiency (SCE) exhibited a significant positive relationship with Market Value Added at (P < 0.05) and Capital Employed Efficiency (CEE) exhibited a significant positive relationship with Market Value Added at (P < 0.05). It was suggested inter alia that firms should always consider human capital as the key factors in the successful implementation of business strategies, since it plays an important role in enhancing productivity and efficiency.

Keywords: Human Capital Efficiency, Structural Capital Efficiency, Capital Employed Efficiency, Market Value Added.

INTRODUCTION

Intellectual capital is considered an asset, and can broadly be defined as the collection of all informational resources a company has at its disposal that can be used to drive profits, gain new customers, create new products, or otherwise improve the business. It is the sum of employee expertise, organizational processes, and other intangibles that contribute to a company's bottom line. In the contemporary era of globalization, almost every organization faces the challenges of managing knowledge resources as all the economic activities are connected with the creation, implementation, and expansion of knowledge resources. Intellectual capital (IC) is the principal strategic intangible factor of the knowledge-based economy. Intellectual capital is the value of a company's employee knowledge, skills, business training, or any proprietary information that may provide the company with a competitive advantage (Chen, 2021). The rise in global technological advancement has characterized the dynamic nature of the twenty-first century business world, increased business connections, expansionary network relationships as well as shortened or decreased product life cycle, which has created a complex environment for organizations to flourish or fail (Modozie and Amahalu, 2022). This development implies that the outward possession of substantial capital and physical assets is not just sufficient to sustain an organisation to gain competitive advantage and stay competitive in its industry and beyond even in the face of threat, hence, the need for the provision of employee knowledge, skills, or any proprietary information that may provide a firm with competitive advantage.

Today, value and value creation for shareholders are among the most important goals of firms and owners. Maximizing shareholder value has become the new corporate paradigm. Different metrics are used for accounting and financial performance. Accounting based income is very important traditional performance evaluation criteria. However, the accounting based income can be manipulated through different methods (Amahalu and Obi, 2020). Therefore, firms need more reliable and accurate performance measures than traditional accounting performance measures. Market value added (MVA) is the amount of wealth that a company is able to create for its stakeholders since its foundation. It is the difference between the current market value of the company's stock and the initial capital that was invested in the company by both bondholders and stockholders. Intellectual capital management has posed challenges in terms of what was being identified and reported, because traditional reporting focused exclusively on tangibles, how it was being reported. Thus, one of problems of intellectual capital management is heterogeneity of the object of management. Heterogeneity is dynamic - the structure of the intellectual capital within a large corporation is changing rapidly and often not predictable (Amahalu, Ezenwaka, Obi and Okudo, 2022). What is included in the concept of intellectual capital, what are its essential features, and can the notions of "intellectual capital", "intangible assets", "objects of intellectual property" and "intellectual product" be clearly separated? These seemingly purely theoretical terminological questions actually turn into a problem of accounting for intangible assets, and therefore - in the problem of determining their value, depreciation, taxation of related transactions, the identification of property rights and much more. Several studies have tried to establish the link between intellectual capital and firm's performance, yet no consensus has been reached. For example, Ali, Murtaza,

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Hedvicakova, Jiang and Naeem (2022); Tom-West, Okoye and Amahalu (2021); Shahwan and Habib (2020); Mbonu and Amahalu (2021), therefore, creating a lacuna which this study sought to fill.

Research Objectives

The broad objective of this study is to determine the effect of intellectual capital on market value added of listed insurance companies in Nigeria. Specifically, this study sought to:

- i. Examine the effect of human capital efficiency on market value added.
- ii. Ascertain the effect of structural capital efficiency on market value added.
- iii. Evaluate the effect of capital employed efficiency on market value added.

Research Hypotheses

Ho₁: Human capital efficiency has no significant effect on market value added

Ho₂: Structural capital efficiency has no significant effect on market value added

Ho₃: Capital employed efficiency has no significant effect on market value added

LITERATURE REVIEW

Intellectual Capital

Intellectual capital is the value of a company's employee knowledge, skills, business training, or any proprietary information that may provide the company with a competitive advantage (Chen, 2021). Intellectual capital is the result of mental processes that form a set of intangible objects that can be used in economic activity and bring income to its owner (organization), covering the competencies of its people (human capital), the value relating to its relationships (relational capital), and everything that is left when the employees go home (structural capital) of which intellectual property (IP) is but one component (Iliemena, Goodluck and Amahalu, 2019).

It is the sum of everything everybody in a company knows that gives it a competitive edge. The term is used to account for the value of intangible assets not listed explicitly on a company's balance sheets (Stewart, 1997). Intellectual capital assists in creating wealth and in the production of other high valued assets. Intellectual capital in a business includes the wealth of the ideas and the ability for innovation which highly determines the future of the firm. Intellectual capital is a business asset, although measuring it is a very subjective task. As an asset, it is not booked on the balance sheet as intellectual capital instead, to the extent possible, it is integrated into intellectual property (as part of intangibles and goodwill on the balance sheet), which in itself is difficult to measure. Companies spend much time and resources developing management expertise and training their employees in business-specific areas to add to the mental capacity of the enterprise (Onyeozili, Okoye, Amahalu and Obi, 2022). This capital employed to enhance intellectual capital provides a return to the company, though difficult to quantify, but something that can contribute toward many years' worth of business value.

Human Capital Efficiency

Human capital refers to the economic value of a worker's experience and skills (Okocha, Okoye, Amahalu and Obi, 2022). Human capital includes assets like education, training, intelligence, skills, health, and other things employers value such as loyalty and punctuality. As such, it is an intangible asset or quality that is not (and cannot be) listed on a company's balance sheet (Kenton, 2022). Human capital is perceived to increase productivity and thus profitability. The more investment a company makes in its employees, the chances of its productivity and success become higher. Human Capital Efficiency (HCE) is one of the three components of Value Added Intellectual Coefficients as postulated by Pulic 1998. Human Capital Efficiency measures the value added by the Human Resources of an organization. Human capital efficiency is the key component of the VAIC model, and it is defined as employees' skills, general knowledge, innovation, and ability.

Structural Capital Efficiency

Structural capital is one of the three primary components of intellectual capital, and consists of the supportive infrastructure, processes, and databases of the organisation that enable human capital to function (Tom-West, Okoye and Amahalu, 2021). Structural capital is owned by an organization and remains with an organization even when people leave. It includes: capabilities, routines, methods, procedures and methodologies embedded in organisation. The stronger an organization's structural capital, the more valuable your business. When the main processes, resources, and infrastructure are well documented and organized, the business value increases as a result.

Capital Employed Efficiency

Capital employed also known as funds employed is the total amount of capital used for the acquisition of profits by a firm or project (Okudo and Amahalu, 2021). Capital employed can also refer to the value of all the assets used by a company to generate earnings. By employing capital, companies invest in the long-term future of the company. Capital employed refers to the capital utilized by the company to generate profits. The figure is commonly used in the Return on Capital Employed (ROCE) ratio to measure a company's profitability and efficiency of capital use (Hayes, 2022). Capital employed efficiency is one of the intellectual capital components based on value added intellectual capital model. It is calculated by dividing value added on capital employed.

Market Value Added

Market value added (MVA) is a calculation that shows the difference between the market value of a company and the capital contributed by all investors, both bondholders and shareholders (Ndulue, Okoye and Amahalu, 2021). In other words, it is the market value of debt and equity minus all capital claims held against the company. The market value added concept derives the difference between the market value of a business and the cost of the capital invested in it. When market value is less than the cost of invested capital, this implies that management has not done a good job of creating value with the equity made available to it by investors. Conversely, when market value is greater than the cost of

invested capital, it indicates that company operations are well run.

MVA = Market Value of Shares – Book Value of Shareholders' Equity

Intellectual Capital and Market Value Added

In the new economic system, which is popularly known as the knowledge economy, intangible or intellectual assets have eventually recognized as the prominent resources. Companies like software, finance, insurance, pharmaceutical, banking, hotel and so on depend to a considerable extent on the intellectual capital for earning revenues. Production or manufacturing companies use Intellectual Capital with its physical assets to sharpen their competitive edge. Ogbodo, Amahalu and Abiahu (2017) found that enterprises, which have managed their intellectual capital better, had achieved stronger competitive advantage than the general enterprises. Also they reported that companies which had strengthened their own intellectual capital management compared to the others had performed better. Omabu, Okoye, Pius and Amahalu (2021) claimed that intellectual capital management played an important role on the long-term business performance of an enterprise. Ndulue, Okoye and Amahalu (2021) concluded that IC is indeed a significant strategic asset, since it is positively related to the firm's market value and financial performance.

Theoretical Review

The underpinning theory of this study is the Knowledge Based View Theory

Knowledge Based View Theory

Knowledge-based view is a theory that recognises knowledge as the most strategically significant resource of the organisation. It emphasises on knowledge resources rather than tangible resources. Knowledge-based view of the firm (KBV) is a management concept of organizational learning that provides firms with strategies for achieving competitive advantage. This is achieved through increased employee involvement in the formulation and administration of the operational goals and long-term transformational objectives of the firm. The continuous acquisition and transfer of knowledge within business organizations is necessitated by such factors as ever-changing competitive conditions in markets initiated by globalization, frequent deregulations, and technical advancements (Ezechukwu, Amahalu and Okudo, 2022). KBV is an important approach towards organizational learning that forms the basis for establishing human capital involvement in the structural and routine activities of the firm. KBV proposes the establishment of heterogeneous knowledge structures across the management hierarchies of a firm as a prerequisite condition for achieving sustainable knowledge-based competitive advantage. This is because knowledge-based resources are always characterized by difficulties of transmission, imitation, and social complexities.

Empirical Review

Xu and Wang (2019) analyzed the relationship between intellectual capital (IC) and performance of the textile industry in China and South Korea during 2012–2017, and measured the contribution of IC sub-components to companies'

performance. The fixed effect regression results showed that the aggregate IC positively affects earnings, profitability, and productivity of textile companies in China and South Korea. At the sub-components level, the contribution of capital employed efficiency (CEE) is the largest, followed by structural capital efficiency (SCE), and relational capital efficiency (RCE) in China's textile industry. In addition, Korea's textile industry relies heavily on CEE and human capital efficiency (HCE), while the contribution of RCE is relatively small. Aleša and Vasilije (2020) examined the relationship between intellectual capital and financial performance of listed Slovene companies from 2014-2018. Multiple regression technique was adopted. The dependent variable was measured with Market-to-Book Value and Tobin's q, while intellectual capital was proxied with Human Capital Efficiency Structural capital efficiency, Capital Employed Efficiency. The regression result revealed the existence of a positive relationship between the components of intellectual capital and Tobin's Q. Ovechkin, Romashkina and Davydenko (2021) investigated the relationship between IC, its components and the level of financial profitability. The study used the system generalized method of moments for a broad sample of Russian firms that operate in the agribusiness industry. The results showed that the efficiency of structural capital usage and the stock of human capital have the biggest impact on the profitability level of the agricultural businesses among employed measures of IC.

METHODOLOGY

Ex-post facto research design was employed in this study.

Population of the Study

The population of this study focused on the twenty-three (23) insurance listed with the Nigerian Exchange (NGX) Group as at 31st December, 2021. They are: African Alliance Insurance, AIICO Insurance, AXA Mansard Insurance, Consolidated Hallmark Insurance, Cornerstone Insurance, Goldlink Insurance, Guinea Insurance, International Energy Insurance, Lasaco Assurance, Law Union and Rock Insurance, Linkage Assurance, Mutual Benefit Insurance, NEM Insurance, Niger Insurance, Prestige Assurance Co, Regency Alliance Insurance, Sovereign Trust Insurance, Staco Insurance, Standard Alliance Insurance, SUNU Assurances Nigeria, Universal Insurance, Veritas Kapital Assurance and Wapic Insurance. The sample size of this study comprised of fifteen (15) insurance companies which was selected using purposive sampling technique for a ten (10) year period covering from 2012-2021. They are: AIICO Insurance, Consolidated Hallmark Insurance, Cornerstone Insurance, Goldlink Insurance, Guinea Insurance, International Energy Insurance, Lasaco Assurance, Law Union and Rock Insurance, Mutual Benefit Insurance, NEM Insurance, Niger Insurance, Staco Insurance, Standard Alliance Insurance, Universal Insurance and Wapic Insurance. Primarily, this study utilized secondary data. The data were sourced from publications of the Nigerian Exchange (NGX) Group fact books and the annual report and accounts of the sampled companies.

Research Variables

a. Value Added Intellectual Coefficient Indices include:

- Capital Employed Efficiency (CEE) measure the efficiency of Capital Employed (CE), where (CE) – book value of firm net assets.

CE = physical capital + financial assets

CE = Total assets – intangible assets

CEE = VA/CE

CE represents tangible resources while HC represents intangible resource

VA_{it} = OUTPUT_{it} - INPUT_{it}

Output_{it} is the total income generated by the firm from all products and services sold during the period t, and input_{it} represents all the expenses incurred by the firm during the period t except cost of labour, tax, interest, dividends and depreciation.

- Human Capital Efficiency (HCE). In VAIC model, HC is defined as salary and wages in a period (Pulic, 1998). Besides showing the firm size, high HC reflects higher employee skills that would add more value compared to employees with lower salary and wages. HCE shows the efficiency of HC usage in creating VA. If the human capital cost is low while VA is high then the firm uses its HC efficiently.

HCE = VA/HC

- Structural Capital Efficiency (SCE). Structural capital (SC) includes strategy, organization network, patent, brand name. Internal structural capital is developed internally, consists of policy and process, work environment, innovation created by research and development. SC is measured using Pulic (1998)

SC = VA – HC

HC and SC are in reverse proportion, increasing HC will decrease SC. SCE is measured (Pulic, 1998):

SCE = SC/VA

- Intellectual Capital Efficiency (ICE) is calculated:

ICE = HCE + SCE

- VAIC - value added efficiency of tangible and intangible assets:

VAIC = CEE + HCE + SCE

Table 1. Variables Definition and Measurement Units

Variable Type	Proxy	Variable Symbols	Variables Explanation
Independent Variable (Intellectual Capital)			
	Human Capital Efficiency	HCE	$\frac{\text{Value Added}}{\text{Human Capital}}$
	Structural Capital Efficiency	SCE	$\frac{\text{Value Added} - \text{Human Capital}}{\text{Value Added}}$
	Capital Employed Efficiency	CEE	$\frac{\text{Output} - \text{Input}}{\text{Total Assets} - \text{Intangible Assets}}$
	Value Added Intellectual Coefficients	VAIC	CEE + HCE + SCE
Dependent Variable			
	Market Value Added	MVA	Market Value of Shares – Book Value of Shareholders' Equity

Model Specification

The model for this study was adapted from Pulic (2000):

$$ROE = \beta_0 + \beta_1 CEE + \beta_2 SCE + \beta_3 HCE + \epsilon$$

Consequent upon the study hypotheses, the following constructs were modeled:

$$MVA_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \epsilon_{it}$$

Where:

- β₀ = Constant term (intercept)
- β_{it} = Coefficients to be estimated for firm i in period t
- ε_{it} = Error term/unexplained variable(s) for firm i in period t
- ROE_{it} = Return on Equity of firm i in period t
- MVA_{it} = Market Value Added of firm i in period t
- HCE_{it} = Human capital efficiency of firm i in period t
- SCE_{it} = Structural Capital efficiency of firm i in period t
- CEE_{it} = Capital Employed Efficiency of firm i in period t

Presentation and Analysis of Data

Table 2. Pearson Correlation Matrix

	MVA	HCE	SCE	CEE
MVA	1.0000			
HCE	0.0474	1.0000		
SCE	0.0861	0.8806	1.0000	
CEE	0.1849	0.2000	0.2516	1.0000

Source: E-Views 10.0 Correlation Output, 2022

From the correlation output in table 2, it could be deduced that MVA positively correlates with HCE, SCE and CEE at coefficient factors of 0.0474, 0.0861 and 0.1849 respectively.

Table 3. Panel Least Square Regression Analysis testing the effect of Intellectual Capital on Market Value Added

Dependent Variable: MVA
 Method: Panel Least Squares
 Date: 09/24/22 Time: 14:58
 Sample: 2012 2021
 Periods included: 10
 Cross-sections included: 15
 Total panel (balanced) observations: 150

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.266952	0.033142	8.054691	0.0000
HCE	0.072253	0.003359	21.50952	0.0000
SCE	0.027169	0.011486	2.365394	0.0193
CEE	0.023768	0.005278	4.502913	0.0000
R-squared	0.782205	Mean dependent var	0.570353	
Adjusted R-squared	0.777730	S.D. dependent var	0.251697	
S.E. of regression	0.118664	Akaike info criterion	-1.398741	
Sum squared resid	2.055839	Schwarz criterion	-1.318457	
Log likelihood	108.9056	Hannan-Quinn criter.	-1.366124	
F-statistic	174.7851	Durbin-Watson stat	2.397595	
Prob(F-statistic)	0.000000			

Source: E-Views 10.0 Panel Regression Output, 2022

DISCUSSION

From the panel regression result in table 3, the estimated coefficient value of C is 0.266952. The constant term is estimated at 0.266952 which means that the model passes through the point 0.266952 if the independent variables are zero. The estimated coefficient for HCE is 0.072253; SCE = 0.027169; CEE = 0.023768 which implies that if other variables that could affect MVA are held constant, a unit increase in HCE, SCE and CEE will respectively lead to 7.23%, 2.72% and 2.38% increase in MVA on the sampled insurance companies. The result also shows adjusted R-squared of 0.777730 to be 77.77%. This implies that about 77.77% change in the dependent variable (MVA) is explained by the independent variables (HCE, SCE and CEE). Table 3 also showed F-statistic value of 174.7851 with a p-value of 0.000000. The p-value = 0.000000 is less than the level of significance of 5% (0.05), thus, accepting the alternate hypothesis (H1). Conclusively, the study submits that intellectual capital has a significant and positive effect on MBV of listed insurance companies in Nigeria at 5% significant level.

Findings

- Human capital efficiency has a significant and positive effect on market value added
- Structural capital efficiency has a significant and positive effect on market value added
- Capital employed efficiency has a significant and positive effect on market value added

Conclusion

This study concludes that intellectual capital (proxied by human capital efficiency, structural capital efficiency and capital employed efficiency) has a statistically positive effect on market value added of listed insurance companies in Nigeria at 5% level of significance.

Recommendations

- Firms should always consider human capital as the key factors in the successful implementation of business strategies, since it plays an important role in enhancing productivity and efficiency.

- ii. Considering the positive relationship between structural capital efficiency and market value added, companies should carefully document and organize their main processes, resources, and infrastructure in a bid increasing the business value.
- iii. Sequel to the positive relationship between capital employed efficiency and market value added, the employed capital of companies should be invested in the long-term future of the company in order to boost the overall performance of the company.

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