Intellectual Capital and Firms' Performance Measures of Listed Non-Financial Companies in Nigeria

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Abstract: The prolonged neglect of intellectual capital by management of firms is a major challenge due to the paradigm shift towards knowledge economy where performance and competitive edge of firms are no longer primarily a matter of machines and tools but of brains and harnessing those brains. It is in view of this that this study investigated the effect of intellectual capital on perfo rmance measures of listed non-financial companies in Nigeria between year 2007 and 2017. The study adopted ex-post facto research design and data were obtained from secondary sources through the audited annual reports of sampled firms and the fact books of Nigerian Stock Exchange. Data such as human capital efficiency, structural capital efficiency and capital employed efficiency were proxies for intellectual capital while return on equity and return on assets was proxies for financial performance. Sample sizes of fifty (50) out of a population of eighty (80) listed non-financial firms on Nigerian Stock Exchange as at December 2018 were purposively selected for the study. Data collected were analyzed using descriptive statistics and panel regression analysis. The results of the study revealed that human capital efficiency, capital employed efficiency, firm size had significant positive effect on return on equity while human capital efficiency, structural capital efficiency, capital employed efficiency and leverage had a significant effect on return on assets. The study concluded that intellectual capital has positive significant effect on financial performance measures. The study recommended a policy framework for the management to increase intellectual capital utilization through investment in human and customer capital to enhance their financial performance and maintain competitive edge.

Keywords: Human capital; intellectual capital; performance; Non-financial firm

JEL Classification: E22; L25; J41

1. Introduction

Modern organizations acquire and efficiently allocate resources in such a way that maximizes returns on investment and creates values for its owners. These resources according to the classicalists include; land, labour and capital. According to Trequattrini (2008), the resources which come in form of assets and finance invested in a firm greatly determine the amount of profit to be made by the business. However, in recent times, the use of information technology, innovation and knowledge termed intellectual capital (IC) have been taken into consideration to impact the productivity and performance of the firms meaning that the resources needed are not limited to tangible resources alone. The emerging economy places great value on the roles of information technology, innovation, structure and knowledge as a sustainable resource to acquire and maintain a competitive edge (Ramezan, 2011).

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Organizations now make highly intensive investment in their employees' development rather than directing their investments, attention and energy purely on tangible assets such as plants, equipment and machinery. This direct investment in employees' development is referred to as intellectual capital. The Organization for Economic Co-operation and Development (OECD, 2008) defines intellectual capital as the economic value of structural capital and human capital, distinguishing it as a subset of intangible assets. Intellectual capital is the knowledge used to transform information into a more valuable asset in order to yield an economic return using the talents of staff, the value of proprietary knowledge and processes, and the value of relationship with customers and suppliers (Stewart, 1998). Intellectual capital is viewed as assets relating to employee knowledge and expertise, customer confidence in the company and the efficiency of company business processes.

The efficiency of intellectual assets relies greatly on practices of the management. This is because apart from the oversight function being performed by the board of directors, they are holistically involved in the optimal utilization of all the available resources (physical, financial and intellectual assets) in creating value and sustaining a competitive edge. According to Horibe (2015), performance and competitive advantage are no longer primarily a matter of machines and tools but harnessing intelligence of brains. For this innate intelligence to be fully captured and use in creating wealth for the company, there is need for a workable system and conducive environment for the components of intellectual capital to thrive. Only when management of firms could provide a platform and system that will allow intellectual capital variables interaction that they will be able to generates and creates value for companies. This value generation is of utmost importance especially to the profit-maximizing companies, who seek better performance in the level of profitability, liquidity, efficiency, returns and leverage.

However, the limitation associated with the estimation of the value of intellectual capital in years past has been a hurricane challenge because financial statements been prepared justify the discrepancy between market value and the book value of a company and therefore do not reflect an organization's value as a whole (Petty & Guthries, 2000 & Holmen, 2011). This challenge that is yet to be overcome has denied the management itself and other stakeholders with interest in the company relevant and timely information that will enable her take vital decision in regards to their human resource, structural and relational capital (Ewereoke, 2018; Yusuf, 2013). The failure of Nigerian firms to properly harness intellectual asset as a key determinants of growth and manage it efficiently has made many of our unskilled labour with intellectual capacity move to other countries of the world with better intellectual capital advantage (Ewereoke, 2019). And this in turn have adverse effect on the performance of firms domiciled in the country.

It is a known fact that an organization's reputation can be enhanced by employing knowledgeable and innovative people of which form the human capital of the firm (Chen, Cheng & Hwang, 2005). In some developed countries like Spain and Norway, gender quota in the employment process of firms have been legislated to achieve a certain level of female representation on the board but in developing countries of Africa, Nigeria inclusive, there is bias in gender quota of staff been employed by most companies with the thought that there are limitations to the contribution of the female gender. This notion has greatly impaired the overall performance of some firms because the needed human capital; structural and relational capital was not acquired nor efficiently managed. This is because the trend of gender diversity could in a way hinder the firm in relating with its network of suppliers or relationship with its customers due to the perceptions and views these stakeholder may hold about the company (Brannstrom & Giuliani, 2009). It will also severe their research and development network and

goodwill which are crucial to their existence and overall performance which most firms sees as a mere bookkeeping device rather than an economic substance (Nnado & Ozouli, 2016).

Many studies have been conducted on the effect of intellectual capital on the firm's financial performance measures both in developed and developing economies. Such studies include Khairu, Ismail & Mohamed (2009); Murale & Fali (2010); Mehralian, Rajabzadeh, Sadeh & Rasekh (2012); Karchagani (2015) in Iran; Huihui & Jitian (2010) in China; Nixon, Augustine & Joseph (2010) in Uganda; Uwuigbe & Uadiale (2011); Ekwe (2012); Salman, Mansor & Babatunde (2012); Onyekwelu, Okoh & Iyidiobi (2017); Kurfi, Udin & Bahamman (2017); Okenwa, Ndubuisi & Chidoziem (2017) in Nigeria; Zehri, Abdelbaki & Bouabdellah (2012) in Tunisia; Basuki (2012); Nuryaman (2015); Gondomono & Hussein (2017); Komnenic & Pokrajcic (2012) in Serbia; Sumedrea (2013) in Roman; Tsai, Yu & Wen (2013) in Taiwan; Berzkalne & Zelgalve (2013) in Baltic; Al-Shubiri (2013) in Jordan; Kariuki (2014) in Kenya; Hasim, Osman & Alhabshi (2015) in Malaysia; Andreeva & Garanina (2017) in Russia; Ozkan, Cakan & Kayacan (2017); Nassar (2018) in Turkey; Araniyar & Chizea (2017) in South Africa; Habib (2018) in Mashhad; Filipe *et al.* (2018) in Portugal etc. However, these studies carried out so far especially in Nigeria fail to adequately explore the interaction among the concerned variables.

It was equally observed from reviews that the focus of many studies that examined the relationship between intellectual capital and performance is majorly the financial sector while the service sector suffers neglect. So, considering non-financial firms in this context plays a critical role in setting the economy in its developmental processes. This is because non-financial firms support largely economic growth. It is then a moderate attempt by the study to fill this gap in literature empirically by investigating the effect of intellectual capital as proxy by Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency on Returns on Equity (ROE), Returns on Assets (ROA) as financial performance measures in the quoted non-financial companies in Nigeria. The remainder of this paper is organized into four different sections as follows: Section two discusses the literature review; section three explains the methodology and section four deals with findings and discussion of results. The study is concluded in section five.

2. Literature Review

2.1. Intellectual Capital and Firms' Performance

Intellectual capital refers to all resources that determine the value of competitiveness of an organization (Apiti, Ugwoke & Chiekezie, 2017). It is the knowledge-based assets which the organization focuses on to increase its efficiency and sustenance of good financial performance. Intellectual capital is the most significant organizational asset in the digital economy and an organization's success will be based on the strategic management of knowledge rather than the strategic allocation of physical and financial resources (Bontis, 1998). Intellectual capital is part of strategic management and used for value creation of an organization to sustain and retain its loyal customers, employees and investors. In literatures, it is further categorized into human, structural and customer capital. Human capital is the mixture of innate legacy, education, experience and attitude about life and business; structural capital in the form of managerial procedures is the serious connection which allow intellectual capital to be dignified organization level while customer or relational capital is the combination of assets used by business in relating with its past, present and potential customers, with its network of suppliers or research and development partners, in addition to

the perceptions and views that they hold about the company (Brannstrom & Giuliani, 2009). Customer capital mainly represents the potential that the company has for intangible items outside of the organizations

Firms' performance is the capability of organizations to meet its stakeholder's needs and its own needs of survival and growth (Abualoush, Masa'deh, Bataineh, & Alrowwad, 2018). According to Apiti, Ugwoke and Chiekezie (2017), organizational performance is an outcome of firm economic activities which can emanate from three definite areas which are; product market performance; shareholder returns and lastly is the financial performance. In this study, the focus is on financial performance which is the profit generating ability of a firm over a given period of time. An important measure of firm performance is profitability. It is an indication of the efficiency with which the operations of the business are carried out which can be measured in various ways such as Return on Investment (ROI), Return on Assets (ROA), Profit after tax (PAT) and Return on Equity (ROE). Financial performance of firms is ultimately important to investors, stakeholders and the economy at large. Investors cherish their returns on investment and well-performing firms enjoy stakeholders' loyalty (Selvam, Gayathri & Vansanth, 2016). Return on assets is a financial measure that signifies the management efficiency in using the existing resources in order to increase the profitability level of the firm. It is also described as the earning power that provides denote how profitable the firm has been in the use of its assets effectively and efficiently (Apiti, Ugwoke & Chiekezie, 2017).

Organizations that contain knowledgeable human capital are likely to outperform those with low levels of knowledge based human capital. In the research work of Kharal *et.al.,* (2014), considering the effect of IC on the performance of 12 oil and gas companies in Pakistan from the year 2005 to 2013, the positive relationship between various forms of intellectual capital efficiency and firm performance measures was documented. Moreso, Kariuki (2014) examined the association among corporate reputation, IC, culture, and performance of 50 Nairobi Stock Exchange in Kenya for the years of 2009 to 2012 using a cross-sectional survey design. Findings showed a strong connection between IC and performance while corporate reputation impacted on the association between IC and performance and culture has no moderating effect. Also, Al-Shubiri (2013) found a strong positive association between IC and productivity of companies and profitability respectively.

3. Theoretical Review

The Knowledge-Based theory underpins this study. The Knowledge-Based theory was propounded by Stalk in 1992. The theory assumes that the competitive ability of any firm is based on capabilities and competencies which are driven by knowledge. According to Marr and Schiuma (2004), organizational capabilities are based on knowledge and since knowledge is a resource that forms the foundation of company capabilities, the ownership of specific knowledge provides organization with specific capabilities. They noted that the possession of knowledge enables specific capabilities and hence, only the management of the knowledge will help an organization identify, maintain and refresh its competencies in the short and long run (Surdarsanam et. al.*,* 2013). This study can therefore be related to this theory as the knowledge acquired by firms are the intellectual capital and the firms can enhance their performance based on the knowledge by harnessing its Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CCE). The hypothesis of the study is formulated on the assumption of the theory that;

HO₁: *Intellectual capital does not have a significant effect on the financial performance of non-financial firms quoted on the Nigerian Stock Exchange.*

4. Empirical Review

Duho and Agomor (2021) assess the nexus between intellectual capital and the performance of listed non-financial firms in West Africa while controlling for some firm-specific and country-specific factors. The study used the Value Added Intellectual Coefficient (VAIC™) to measure intellectual capital performance while return on asset measures profitability. Panel-corrected standard error regression was used analyzing the data gathered spanning through 2007 to 2018. The findings indicate that structural capital efficiency is a major driver of profitability while human capital efficiency and capital employed efficiency is found not to have a significant impact on profitability among non-financial firms. It was submitted that intellectual capital has an inverted U-shaped nexus with performance. In the study of Muhammad, et al., (2020), VAICTM calculation technique is applied to investigate the significance of the IC on financial performance and investment decisions of non-financial sector of Pakistan. 396 companies of non-financial sector in Pakistan form the study population. The outcomes of the study express that the intellectual capital has meaningful association with financial performance and investment decisions.

Nnubia, Okolo and Emeka-Nwokeji (2019) investigate the effect of intellectual capital on performance of non-financial firms in Nigeria. A sample of 21 Nigerian non-financial firms listed on Nigerian Stock Exchange for a period of 10 years (from 2007-2016) Data collected were analysed using Ordinary Least Square Method. The results showed that for the Nigerian listed non-financial firms, the explanatory variables – capital employed efficiency, human capital efficiency and structural capital efficiency has positive and significant effect on measurement of performance. Elfiswandi *et al.* (2019) explored the influence of IC on the financial performance of 25 listed banking companies in Indonesia from the year 2008 to 2013 using an explanatory method (verification survey) and descriptive survey) while the data analysis method used is data panel regression. Findings showed SCE, HCE and CEE positively influenced performance while CEE slightly influenced Net Interest Margin. Contribution to the world of banking needs to observe the decisions of capital employed efficiency in improving human resources in upgrading bank performance.

In the same vein Josua *et al*. (2018) investigated the influence of intellectual capital on Indonesian manufacturing firms' financial performance with an emphasis on profitability, market value, and productivity based on the VAIC approach. Ten regression models was used in assessing all the relationships of the variables employed and it was found out that VAIC had a strong relationship with the performance of the firm but have a negative influence on the value of the sampled companies. Nassar (2018) examined the effect of IC on the performance of 27 quoted real estate companies in Turkey from the year 2004 to 2015 using VAIC techniques component of HCE, SCE, CEE as control of IC. The finding showed SCE played a crucial impact on value creation in real estate firms and possess a strong relationship with performance indicators before the crises and after the crises. The study concluded that Turkish businesses still have little value in intellectual capital. Also, Habib (2018) looked at the influence of IC on companies' performance in exporting companies in the Development Centre of Science and Technology Park of Mashhad. The study population was 460 managers of exporting sampled companies, out of which the study sample has been randomly selected among the top-level and middle-level managers of these companies. The study employed Smart PLS as a research technique. Findings showed no connection

between structural capital and firm performance. Furthermore, innovation capacity positively influences the performance of companies.

The effect of IC on the output of quoted Nigerian consumers' industry companies from 2010 to 2014 was examined by Kurfi, Udin and Bahamman (2017) using Pulic VAIC techniques. The study employed regression analysis techniques to assess the hypotheses and the result showed a positive significant influence of IC on performance while both SCE and CEE influenced the performance of Consumer sector firms in Nigeria. Okenwa, Ndubuisi, and Chidoziem (2017) investigated the effect of IC on the financial performance of 15 quoted Nigerian banks from the year 2010 to 2015 using survey research design and VAIC techniques. The study employed multiple regression analysis techniques and findings showed a significant positive association between IC and financial performance of Nigerian banks. Irawanto, Gondomono, and Hussein (2017) studied the impacts of IC on profitability moderated by CG and IT techniques integration of 33 Indonesian Banking Companies from 2013 to 2014. Regression analysis techniques were employed. Findings revealed that HCE has a great impact on the profitability while IT techniques integration expressly proved to deteriorate the influence of VAIC on banking performance.

Nuryaman (2015) studied the impact of IC on the value of firms with 93 manufacturing companies in Indonesia during the year 2012 using VAIC methodology. Findings showed that IC positively impacted the value of the firm. Furthermore, Hasim, Osman, and Alhabshi (2015) investigated the connection between IC and organization performance of Malaysian firms from the years 2008 to 2014. A well-structured questionnaire was made to elicit facts from the respondents with non-probability convenience sampling. Multiple analysis techniques were employed for the study and findings showed IC has a landslide influence on the organization performance of Malaysian companies. But, Karchagani (2015) looked at the influence of IC and innovation on the performance of 294 Iranian Agricultural Insurance sectors during 2013 using correlation, multivariate regression analysis technique, and Structural Equation Model. Findings revealed IC and its components are mutually associated with both innovation and performance.

5. Methodology

The study adopted *ex-post facto* research design and data were obtained from secondary sources through the audited annual reports of sampled firms and the fact books of Nigerian Stock Exchange. Data such as human capital efficiency, structural capital efficiency and capital employed efficiency were proxies for intellectual capital while return on equity and return on assets was proxies for financial performance. Sample sizes of fifty (50) out of a population of eighty (80) listed non-financial firms on Nigerian Stock Exchange as at December 2018 were purposively selected for the study. Data collected were analyzed using descriptive statistics and panel regression analysis.

Model Specification

This study employed baseline model adapted from Ahangar (2011) and Kurfi *et al.* (2017) which was in line with the Knowledge-based Theory. The baseline model functional relationship between financial performance measures and intellectual capital was given in the model below:

$$P.I = f(IC) \tag{1}$$

Where $P.I$ represents performance indicator variables, IC represents Intellectual Capital. For the study, the performance indicator variable is Return on Asset (ROA) and Return on Equity (ROE) while VAIC represents intellectual capital vector. The intellectual capital is proxied by vector Value Added Intellectual Coefficient.

The performance indicator of ROA and ROE resulted into equation 2

$$ROA_{it} = \overrightarrow{f(VAIC^{TM})} \tag{2}$$

$$ROE_{it} = \overrightarrow{f(VAIC^{TM})} \tag{3}$$

The vector is decomposed into Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE).

The model is given as:

$$ROA_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 AGE_{it} + \beta_5 LEV_{it} + \beta_6 FIRM\_SIZE_{it} + e_{it} \tag{4}$$

$$ROE_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 AGE_{it} + \beta_5 LEV_{it} + \beta_6 FIRM\_SIZE_{it} + e_{it} \tag{5}$$

Where:

ROA =Return on Asset

ROA =Return on Equity

HCE =Human Capital Efficiency

SCE =Structural Capital Efficiency

CEE =Capital Employed Efficiency

AGE=the numbers of years the companies are in operation

LEV =Leverage is the ratio of total debt to equity

FIRM_SIZE= the natural logarithm of total asset

6. Results and Discussion

Descriptive Statistics of the Variables

This section reveals the analysis of the relationship between intellectual capital and financial performance measures of listed non-financial companies in Nigeria. The results of the analysis are shown in Table 1, 2 and 3.

Table 1 presents the descriptive analysis of the data. Return on Assets (ROA) had a mean value of 0.077, a median of 0.046 coupled with a maximum and minimum value of 7.856 and -3.505 respectively. Also, its standard deviation is 0.454 and skewness is 7.8677 while the Kurtosis is 165.994. This means that the non-financial firms averagely report positive skewness across the sampled period. In the same vein, the mean and median of Return on Equity (ROE) are 0.162 and

0.111 respectively with a maximum and minimum value of 9.762 and -4.918. Also, its standard deviation is 0.762 and skewness is 3.771 while the Kurtosis is 72.735. The Capital Employed Efficiency (CEE) mean value is -0.021 while the median is 0.000 with a maximum and minimum value of 10.639 and -11.858 respectively. Also, its standard deviation is 1.137 and skewness is -0.320 while the Kurtosis is 43.405. Human Capital Efficiency (HCE) had a mean value of 0.686, a median of 0.193 coupled with a maximum and minimum value of 40.408 and -45.136 respectively. Also, its standard deviation is 5.601 and skewness is -0.622 while the Kurtosis is 32.061. Structural Capital Efficiency (SCE) report mean value of 0.567, a median of 0.921 together with a maximum and minimum value of 15.713 and -13.352 respectively. Also, its standard deviation is 1.743 and skewness is 0.061 while the Kurtosis is 24.550. The Age of the firm was expected to be dispersed. AGE report means of 47 years and a median of 48 years over the sampled period. LEV reported one of the highest levels of dispersion in the sampled firms with a mean of 2.203 and a median of 1.305. It implied that some firms report extremely high debt to equity ratio.

Table 1. Descriptive Statistics of the Variables

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Observations
ROA	0.077	0.046	7.856	-3.505	0.454	7.867	165.994	550
ROE	0.162	0.111	9.762	-4.918	0.706	3.771	72.735	550
CEE	-0.021	0.000	10.639	-11.858	1.137	-0.320	43.405	550
HCE	0.686	0.193	40.408	-45.136	5.601	-0.622	32.061	550
SCE	0.567	0.921	15.713	-13.352	1.743	0.061	24.550	550
AGE	47.146	48.000	94.000	2.000	20.316	0.100	2.703	550
FIRM_SIZE	16.526	16.539	23.926	7.853	1.961	0.067	4.413	550
LEV	2.203	1.305	71.572	-34.299	6.146	5.472	61.107	550

This table shows the descriptive statistics of the variables used for this study.
Source: Author's Computation (2020)

Correlation

The correlation matrix shows the relationship between the dependent and the independent variables. The result also shows the relationship that exists between the independent variables and further shows symptoms of multi-collinearity if any. The result obtained shows that there exists a relationship between the dependent variable and the independent variables which signifies that the independent variables can influence or affect the dependent variables. Table 2 demonstrates that the regressors are not multi-collinear.

Table 2. Correlation

Correlation Probability	ROA	ROE	CEE	HCE	SCE	AGE	FIRM_SIZE	LEV
ROA	1.0000							

ROE	0.0976*	1.0000						
	(0.0191)	-----						
CEE	0.4638*	0.2695	1.0000					
	(0.0000)	(0.0000)	-----					
HCE	-0.0587	-0.1484*	-0.1121*	1.0000				
	(0.1589)	(0.0004)	(0.0070)	-----				
SCE	0.0284	-0.0153	0.0458	-0.0367	1.0000			
	(0.4963)	(0.7123)	(0.2723)	(0.3792)	-----			
AGE	0.0407	0.0135	-0.0392	0.0314	-0.1115*	1.0000		
	(0.3283)	(0.7454)	(0.3471)	(0.4506)	(0.0074)	-----		
FIRM_SIZE	-0.1501*	0.0620	-0.0853*	0.0021	0.0183	0.0639	1.000000	
	(0.0003)	(0.1370)	(0.0406)	(0.9584)	(0.6597)	(0.1252)	-----	
LEV	-0.0251	0.0596	-0.3690*	0.0681	-0.0219	0.0673	0.0849*	1.000000
	(0.5473)	(0.1525)	(0.0000)	(0.1020)	(0.5984)	(0.1064)	(0.0416)	-----

The results of the analysis of the explicatory variables are shown in this table. The results indicated that the variables were not exhibiting serious correlation with one another. This informed the inclusion of all the explanatory variables in the model. P-value in parenthesis and * indicated level of significant at 5%.

Source: Author's Computation (2020)

Discussion of Findings

Table 3 presents regression results of the effect of intellectual capital on financial performance measures of listed non-financial companies in Nigeria. The model was estimated using Fixed Effect and Random Effects assumption. 50 quoted non-financial companies from 2007 to 2017 were sampled. Return on Assets (ROA) and Return on Equity (ROE) were used as financial performance measures. Intellectual Capital variables were Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) while Firm Age (AGE), Firm Size (FIRM_SIZE) and Firm Leverage (LEV) were control variables. However, in order to reduce the tendency of weak parameters, Hausman test for correlated random effects was conducted to provide the best model estimates for the data (see Table 3 for result) and consider if the variance in the estimates of the random and fixed effect models are significant to cause biasness of the model parameters. The Hausman test (Chi-Sq. statistics) rejects the null hypothesis that unobserved firm specific heterogeneity are uncorrelated with explanatory variables and so, the study employed the Fixed Effect Method (FEM) which is the most appropriate model to interpret the result of the analysis.

For the ROE as a dependent variable, Human Capital Efficiency (HCE) showed a coefficient value of 1.58 which implied a significant positive relationship with ROE (t=3.1319, p<0.05). This showed that

the degree of returns to equity gained from non-financial companies in Nigeria is significantly affected by human capital efficiency. Also, it implied that firms can be more profitable through a robust human capital management system. However, it is associated with a statistically non-significant Structural Capital Efficiency (SCE). Also, Capital Employed Efficiency (CEE) showed a coefficient value of 19.49 which implied a significant positive effect on ROE (t=6.7011, p<0.05). This showed that high numbers of Nigerian non-financial companies can utilize the CEE. This indicated that the high value of Capital Employed Efficiency (CEE) leads to increasing profitability in Nigerian non-financial firms. The age of the firm had a significant negative relationship with ROE (t= -2.2755, p<0.05). This indicated that the longevity of a firm does not necessarily implied profitability. Emerging firms do come with product innovation to have a good share of the market. They are vibrant with cost-effectiveness. They grew with the trend, while most of the old or aged companies in Nigeria relied on brand loyalty with a low level of innovation. Firm size reported a coefficient value of 6.38 which implied a significant positive relationship with ROE (t=2.2177, p<0.05). This showed that firm size played a prominent role in the profitability of firms. A firm with a strong total asset tends to expand and work within the band of efficiency. This size of firms will determine the quality of human resources to be employed and financial resources to access. Highly skilled employee prefers to work in a big firm with a high level of reputation compares to a small firm. Furthermore, for the Return on Assets (ROA) as a dependent variable, Capital Employed Efficiency (CEE) showed a coefficient value of 21.82 which implied a significant positive relationship with ROA (t=13.5989, p<0.05), the company is more profitable through the efficient utilization of their capital amidst the statistically insignificant effect of Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE) on Return on Assets (ROA). The leverage ratio showed a coefficient value of 1.42 which implied a significant positive effect on ROA (t=4.7112, p<0.05). However, firm size showed a coefficient value of -9.75 which implied a significant negative effect on ROA (t=-6.1396, p<0.05). The F-statistics test of the significance of the model indicates that the model was statistically significant at 5% level of significance. The R^2 coefficient was used in determining the coefficient of determination of the model, the R-squared (R^2) value of 27.1% indicated that about 27.1 percent of the source of variation in ROE was accounted for by the independent variable, while an F-statistics value of 3.26 with a p-value of less than 0.05 implies that the model is statistically different from zero. For the ROA, 41.0% of the source of variations was accounted for by the independent variable with an F-statistics value of 6.08 implies that the explanatory variables are jointly different from zero.

Table 3. Effect of Intellectual Capital on Performance Measures of Quoted Non-financial Companies in Nigeria

	Model 1		Model 2	
Method:	Fixed Effect	Random Effect	Fixed Effect	Random Effect
Dep. Var:	ROE	ROE	ROA	ROA
CEE	19.4955	21.5712	21.8275	21.9280
	[6.7011]**	[7.6797]**	[13.5989]**	[14.0921]**
HCE	1.5891	1.6078	0.0601	-0.0532
	[3.1319]**	[3.3154]**	[0.2150]	[-0.1979]
SCE	-1.2500	-1.1973	0.1100	0.3255
	[-0.7564]	[-0.7638]	[0.1207]	[0.3736]
AGE	-2.1545	0.0139	-0.0788	0.1129
	[-2.2755]*	[0.0846]	[-0.1510]	[1.1504]
FIRM_SIZE	6.3880	2.8433	-9.7568	-4.1187
	[2.2177]*	[1.7781]	[-6.1396]**	[-4.4416]**
LEV	0.9437	1.8278	1.4298	1.2885
	[1.7156]	[3.7613]**	[4.7112]**	[4.7367]**
C	12.5147	-32.3998	169.8753	67.7957
	[0.2499]	[-1.1915]	[6.1486]**	[4.2952]**
Observations:	550	550	550	550
R-squared:	0.2721	0.1168	0.4105	0.2807
F-statistic:	3.2685	12.5384	6.0898	37.0117
Prob(F-stat):	0.0000	0.0000	0.0000	0.0000
DW	2.125	1.8539	1.9313	1.7251

***, ** and *reveals that variable is significant at 1%, 5% and 10% respectively.
Source: Author's Computation (2020)

Table 4. Result of Hausman Test on the Effect of Intellectual Capital on Performance Measures of Listed Non-Financial Company in Nigeria

Correlated Random Effects - Hausman Test(Model 1 and 2)			
Test Summary(Model 2)	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	35.512	6	0.0000
Test Summary (Model 1)	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	24.960	6	0.0000

Source: Author's Computation (2020)

7. Conclusion and Recommendations

The study having investigated the effect of intellectual capital on performance measures of listed non-financial companies in Nigeria during an eleven years period, the regression results revealed that human capital efficiency, capital employed efficiency, firm size had significant positive effect on

return on equity while human capital efficiency, structural capital efficiency, capital employed efficiency and leverage had a significant effect on return on assets. Based on this, the study concludes that intellectual capital has positive and significant effect on financial performance measures. So, henceforth non-financial firms should give appropriate consideration and attention to intellectual resources since its efficiency improves financial performance.

Recommendations

1. The study advocate for more investment in quality intellectual capital formation as it ensures higher return and value creation.

2. There should be a policy framework from the end of regulators to increase the interest of firms' management in intellectual capital development and utilization to enhance their financial performance and maintain competitive edge.

3. Non-financial firms should manage efficiently their stakeholders relationship to boost their relational capital and in turn the financial performance of the organization

This study suggest a further area of research as the study limit its scope to only listed non-financial companies and the result cannot be used to generalize what happened in other sectors like financial institutions and service oriented firms. Also it only makes use of financial performance measures while non-financial performance measures that may explain the situations also were not included. All these can be inculcate in the further areas of studies.

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