Effect of Intellectual Capital on Financial Performance of Listed Agricultural Firms in Nigeria

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ABSTRACT: *The study examines the effect of intellectual capital on financial performance of listed agricultural firms in Nigeria. Proxies to measure intellectual capital are human capital and structural capital, while the financial performance is peroxide by return on equity. The study concentrated on the period from 2011 to 2020. Panel data was used to analyze the data sourced from the individual financial reports of the listed agricultural sectors. The sample adopted four (4) listed agricultural firms out the five (5) in Nigeria due to inconsistent data. The study employed panel regression model to estimate the key relationship between intellectual capital and return on equity. The result shows that human capital has significant effect on return on equity. Also, the result shows that structural capital has no significant effect on return on equity. The study recommends that managers of agricultural firms should put great emphasis on human capital investment, by improving employees' quality by continuous training, and also to recruit high-level talents. Also, the management should pay attention to the accumulation of proprietary knowledge base such as the patent right and information system.*

KEYWORDS: intellectual capital, human capital, structural capital, return on equity, listed agricultural firms.

INTRODUCTION

It is the primary concern of business organization to give significant attention to firm performance because of its implications to business survival. High Performance reflects management effectiveness and efficiency in making use of company's resources and thus in turn contributes to the firm's intellectual capital. Knowledge has become the new frontier in corporate management because value can be generated through intangible assets not often reflected in the financial statements. Yet, to succeed in such an environment, creativity, innovation and skills management is imperative. Although these intangibles relate strictly with intellectual capital that is difficult to measure, they are critical in the successful management of modern corporate entities (Adegbayibi, 2021).

Intellectual capital is developed or created within the organization through the utilization of the resources for example: skilled staff, product diversity and professional relationships with the stakeholders. Effective utilization of the intangible resources such as knowledge is the driver for better performance for the organization. The increase of useful knowledge as well as the knowledge application extensions is the essence of the knowledge economy. However, without proper utilization of this knowledge it will lead the organization to failure. Thus, it is important to measure the intellectual capital also from the utilization perspective instead of just depending on traditional accounting measures. Value Added Intellectual Coefficients (VAIC) is a very important and consistent approach. VAIC is a component of Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) which is develop by Pulic (2004).

Firm performance clearly predicts the efficiency of management and its ability to create the earnings for the firm which is expected to generate returns for the business. However, after a pilot survey, the existing condition of the firm's output has heavily inclined towards financial and physical asset, as most agricultural companies have been folding up in Nigeria, this is despite the continuous intellectual capital programmes carried out in the sectors to best equip the firms is a major concern with high importation of agricultural produce.

The main objective of the study is to examine the effect of intellectual capital on financial performance of the five (5) listed agricultural firms in Nigeria from 2011-2020. The firms are Ellah lakes, FTN cocoa processor, Livestock feeds Nigeria, Okomu oil palm and Presco oil.
In line with the main objective of the study, the following hypotheses was tested:

H_{01}: Human capital ratio have no significant effect on return on equity of listed agricultural firms in Nigeria.

H02: Structural capital have no significant effect on return on equity of listed agricultural firms in Nigeria.

LITERATURE REVIEW

Concept of Intellectual Capital

According to Wall, et al. (2004), intellectual capital is the value added for the company, and it is the aggregation of knowledge which is used in the business value creation process. Edvinsson, (1999) argues that intellectual capital is a combination of mental acts, but not mere knowledge or pure intelligence; the discrepancy between company's market value and book value is explained as intellectual capital. Further, he opines that intellectual capital is "the experience, organizational technology, customer relationship management and professional skills that makes a company more competitive in the market". Low and Kalafut, (2002), defined intellectual capital as intangible assets which include technology, customer information, brand name, reputation and corporate culture that are invaluable to a firm's competitive power.

In a simplified definition, Edvinsson (2003) expressed intellectual capital as what helps any company to be sustainable and have competitive advantage in the future as well as an indicator of whether that company will be maximizing value. It is impossible for a company to gain momentum for reforms unless it invests in intangible assets (Muturi, et al. 2019). Meanwhile, Cabrita and Vaz (2006) simply stated that intellectual capital is a matter of creating and supporting connectivity between all sets of expertise, experience and competences inside and outside the organization.
Mohammed and Ismail (2009), Intellectual capital is measured by the VAIC TM method developed by Pulic. This model starts with the company's ability to create value added (VA). VA is calculated as the difference between output and input. VA is influenced by the efficiency of Human Capital (HC) and Structural Capital (SC) and employed capital (CE).

Concept of Human Capital

Ting and Lean (2009), defined human capital through innovation capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivation, satisfaction, learning capacity, loyalty, formal training and education. Human capital, the value that the employees of a business provide through the application of skills, know- how and expertise. Human capital is an organization's combined human capability for solving business problems and exploiting its Intellectual Property (Anindya, et al. 2021). Human capital refers to people who are part of a firm, especially the knowledge these persons have (White, 2007). Commonly, it refers to the tacit knowledge, such as experience, loyalty, culture, and education that exist in every worker of a firm.

Subsequently, Nurpermana and Mulya (2020) opined that human capital refers to the acquired skills, knowledge and abilities held by individuals and obtained through their education; training

and experience often cited as an intangible asset that differentiates financial performance among firms. Similarly, Becker and Gerhart (1996) defined human capital as knowledge, skills, health or values that unlike physical and financial capital cannot be separated from persons who own it. Becker (1993) defined human capital as the knowledge, information, ideas and skills of individuals. OECD (1998) defined human capital as knowledge, skills, competence and attributes embodied in individual that are relevant to economic activity. In addition, Hatch and Dyer (2004) suggest that human capital reflects knowledge and skills embodied in people. Human capital is the sum of employees' competence, knowledge, skills, innovativeness, attitude, commitment, wisdom, and experience. It represents the individual knowledge stock of an organization. It is the intangible assets that employees cannot take away when getting off work or leaving organizations.

Concept of Structural Capital

Structural capital defined as the organization's potential and capabilities in facing the internal and external challenges (Cabrita & Vaz, 2005). Structural capital is the intellectual asset which is independent of individuals; hence, structural capital remains after employees leave the company (Sydler et al., 2014). Therefore, SC is considered as a non- human stock of knowledge that includes each of the information technology, trademarks, patents, and plans, which can be represented by databases, software, hardware, and organizational structures (Chen, et. al., 2005). Structural Capital Efficiency (SCE) represents all the conditions which enable human resources to produce the added value for the company. It is measured by the remaining value of the value-added after subtracted with human capital figures.

Bontis et al. (2000) identified structural capital through organizational databases, organizational charts, process manuals, strategies and routines. To this end, it follows that, properly and adequately managed intellectual capital is the key driving factor for sustainable corporate success. Structural capital, the supportive non-physical infrastructure, processes and databases of the organization that enable human capital to function. Structural capital includes processes, patents, and trademarks, as well as the organization's image, organization, information system, and proprietary software and databases and relational capital, consisting of such elements as customer relationships.

Concept of Financial Performance

Firm performance can be observed from two points of view: financial and organizational; a company's performance can be measured based on variables that involve productivity, returns, growth or even customer satisfaction. Financial performance is based on the firm's efficiency reflected in profit maximization, maximizing returns and maximizing shareholders return. According to Anindya, et al. (2005), the assessment of financial performance is based on the return on investment, residual income, earnings per share, dividend yield, price/earnings ratio, growth in sales and market capitalization.

Nurpermana and Mulya (2020) pointed that financial performance is the measure of how well a firm can use its assets from its primary business to generate revenues. He also noted that financial performance measures like profitability and liquidity among others provide a valuable tool to stake holders which aids in evaluating the past financial performance and current position of a firm. Wall, et al. (2004) also referred to it as the proportions of capital at work in a business by type, namely, equity capital and debt capital, each of which having its own benefits and drawbacks.

Edvinsson (2003) viewed a firm's performance as the result of a company's assessment or strategy on how well a company accomplished its goals and objectives. Financial performance provides a deductive measure of how well a company can use assets from business operations to generate revenue. Van Horn (2005) defined financial performance as a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. This term according to Pandey (2001) is used as a general measure of the overall financial health of a business. Research on the firm's financial performance emanates from organizations theory and strategic management. The notion of financial performance is used to describe performance of an entity with the legal status of a company.

Yuzhong, et al (2020) pointed that financial performance is a complex word and holds myriad of meanings, due to its dimensional nature. The word can be viewed at different angle: financial and company. An entities performance can be derived by using variable that represent yield, revenue, growth and consumer satisfaction. On the other hand, financial performance, which demonstrate the maximization of shareholders' wealth, can be measured by looking at a company's productivity. The calculation of financial performance is done by using profitability ratios such as return on equity.

Empirical Review
Human Capital and Financial Performance
Shaneeb and Sumathy (2021) examined the impact of intellectual capital (IC) on financial performance of the Indian textile industry by using Public's Value-added intellectual capital coefficient (VAIC) model. The study used profitability (ROA), productivity (ATO), and returns on equity (ROE) as the proxies for measuring firm's financial performance. The study selected the top 81 textiles companies on the basis of market capitalization. The results show that the IC efficiency has a significant and positive relationship with the profitability and Return on equity of the Indian textile industry and inconsequential impact on productivity. Whereas, among the IC components, capital employed efficiency (CEE) is the highly significant component that impact all the indicators of financial performance while human capital efficiency (HCE) only impacts on profitability. The study also found that structural capital efficiency (SCE) has insignificant impact on profitability, productivity, and return on equity of the textile industry in India. However, the study was conducted in India which results might be different from studies in Nigeria.

Rehgita (2021) analyzed the influence of intellectual capital on firm performance. The population in this study is all consumer goods industry sector companies listed on the Indonesia Stock exchange for the period 2014-2018. Sampling in this study using purposive sampling, as many as 40 companies were selected as samples with a total 200 observation. The analysis method used in this research is regression analysis with fixed effect model approach and hypothesis testing. The result showed that the board of directors, the proportion of independent commissioner and intellectual capital have positive and significant effect on firm performance. Meanwhile, gender diversity and the board of commissioner have no effect on firm performance. The advice provide is for investors and companies to pay attention and consider the variables that effect on firm performance such as the board of directors, the proportion of independent commissioners and intellectual capital as a consideration to assess the firm performance. As for further research, the gender diversity variable can be measured using other proxies such as the blau index or so on. Furthermore, researcher are also expected to add other independent variables that effect on firm performance that is applicable to this study.

Muthia, et al. (2021) examined the influence of intellectual capital and the financial to deposit ratio (FDR) on the financial performance of Indonesian Sharia Banks from 2010 to 2015. This study employed three main components of Value-Added Intellectual Capital (VAICTM), including Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE). Moreover, in measuring financial performance, this study used ROA as the proxy. This study used data from Sharia Banks' financial report. The analysis technique in this study is multiple regression model with hypothesis testing by using t test. After the classical assumption tests, the empirical results reveal that all of the independent variables have significant impacts on RO. Surprisingly, the strongest influence factor in strengthening the financial performance is Human Capital Efficiency (HCE). This study has contributed to an expand understanding on the relationship between intellectual capital, FDR and financial performance. However, the study was conducted in India which results might be different from studies in Nigeria.

Anindya et al (2021) examine the effect of intellectual capital on financial performance and the market value of the property and real estate companies in Indonesia. The population of the research is 56 property and real estate companies listed on the Indonesia Stock Exchange (IDX) from 2014 to 2018, then the sampling technique used is purposive sampling which results in 42 companies being studied with 210 observations. This study uses independent variables, namely Value-Added Capital Employed, Value Added Human Capital, and Structural Capital Value Added as a representation of intellectual capital. The dependent variables in this study are financial performance and market value. The data analysis technique used is multiple linear regression. The results show that simultaneously intellectual capital has an effect on financial performance, but it has no significant effect on market value. Partially, only structural capital has a positive and

significant effect on the company's financial performance. However, the study did not conduct pre-estimation test.

Adegbayibi (2021) investigated the relationship between intellectual capital and performance of listed non-financial companies in Nigeria. The study adopted ex-post facto research design, and data were drawn from the audited annual reports of fifty (50) listed non-financial firms for a period of 2007 to 2017. Multiple regression techniques were employed to test the relationship among the variables. The results of the study revealed that both intellectual capital and corporate governance drive financial performance as the relationship is found significant in all components. The study concluded that corporate governance moderated the effect of investment in intellectual capital on financial performance. The study recommends that Board of directors should adopt measurable corporate governance mechanism which strengthens and helps in investment strategy that increases and improves performance. However, the study used primary source of data, which result might this different from this particular research.

Structural Capital and Financial Performance
Muhammad, et al. (2021) analyzed the effect of intellectual capital, independent directors, academic directors, and sharia supervisory boards on the financial performance of Islamic banks. The selection of samples observation based on the database of Best Islamic Financial Institutions Award, includes Afghanistan, Algeria, Bahrain, Bangladesh, Brunei Darussalam, Egypt, Indonesia, Jordan, Kazakhstan, Kuwait, Lebanon, Malaysia, Maroko, Nigeria, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Singapore, South Africa, Sri Lanka, Thailand, Tunisia, Turkey, and Uni Emirate Arab. This study uses a sample of 20 Islamic banks in several countries which received the "Best Islamic Financial Institutions Award 2018" by Global Finance Magazine and has published financial reports for the period of 2013-2017. This study adopted panel regression analysis and utilized the Random Effect Model. The results of the study prove that intellectual capital has a positive effect on financial performance. While independent directors, academic directors, and the Sharia Supervisory Board (SSB) have no effect on the financial performance of Islamic banking companies. These results indicate that intellectual capital is a force for Islamic banking to increase company value through financial performance. While the factors related to corporate governance tend to reduce performance due to several limitations for management in carrying out its operational activities. This study has a limitation in using Islamic banking data from various countries with backgrounds that are certainly different from one another which might be bias.

Alfiero, et al (2021) investigated the effect of intellectual capital on healthcare organization' performance in the Italian healthcare system. The theoretical framework linked to intellectual Capital in the health sector and the performance evaluation related to efficiency supports the analysis carried out in two stages to determine the right placement of resources and the exogenous variables that influence performance level. The evaluation of the impact of the ICs on performance

is determined through the Data envelopment analysis. The incidence of the exogenous variables has been established through linear regression. Empirical results in Italy show some IC components influence organization 'performance (Essential Levels of Assistance) and could be used for defining the policy of allocation of resources in healthcare sector. The efficiency of 16 regions considered in 2016 based on Slack-Based-Model constant returns-to-scale (SBM-CRS) and Slack-Based-Model variable returns-to-scale (SBM-VRS) identifies a different ability to balance IC and performance. Current healthcare expenditure and the number of residents is correlated with the identified efficiency and performance levels. This study embeds an innovative link between healthcare performance, in term of efficiency and IC which did not align resource management with future strategy.

Anik, et al. (2021) analyzed the impact of the company's financial performance in mediating the relationship between Intellectual capital and good corporate governance (GCG) on Corporate Value in banking companies listed on the Indonesia Stock Exchange (IDX). Also, this study analyzes the direct effect of intellectual capital and GCG on corporate value and the indirect effect through the company's financial performance. This study develops research of Chen et al. (2005) and measures Intellectual Capital with VAIC (Pulic, 1998). VAIC model is more accurate to measure Intellectual Capital because it can show potential intellectual use efficiently. The data used are banking companies listed on the IDX in 2014–2016 with purposive sampling technique and Data Analysis Technique used are path analysis. The results showed that the financial performance of banking companies was proven to mediate the relationship between intellectual capital and GCG. The role of GCG that can improve financial performance and corporate value is only GCG as measured by the ratio of independent commissioners and audit quality. Meanwhile, the financial performance and corporate value audited by the Big 4 will be greater than the financial performance and corporate value of the banking companies listed on the Indonesia Stock Exchange that are not audited by the Big 4.

Shuang et al (2021) investigated the impact of intellectual capital (IC) and its components on financial competitiveness and green innovation performance. Data were collected from renewable energy companies listed on the Shanghai and Shenzhen stock exchanges during 2013–2018. The modified value added intellectual coefficient (MVAIC) model is applied as a proxy for IC efficiency, an index system is constructed to systematically measure financial competitiveness, and green innovation performance is measured by the total number of green patents, the number of green invention patents, and the number of green no invention patents. e empirical results show that IC has an inverted U-shaped relationship with financial competitiveness and no impact on green innovation performance. Regarding IC components, human capital (HC), structural capital, and relational capital positively affect financial competitiveness. HC has a negative impact on green patents, while innovation capital has a positive impact on green invention patents. Physical capital is the main driving force of green innovation performance. However, the study was conducted in China which results might be different from studies in Nigeria.

As'ad and Panggabean (2021) determined the effects of Intellectual Capital, Leverage, and Liquidity on Firm Performance. Sample are secondary sector companies on the Indonesia Stock Exchange and used panel data regression for analysis. The data are collected from 2013–2018 annual reports of the secondary sector companies listed on the Indonesia Stock Exchange. The research found that Intellectual Capital and Liquidity had positive effects on Firm Performance in secondary sector companies. Meanwhile, Leverage did not affect Firm Performance in secondary sector companies listed on the Indonesia Stock Exchange. Future researchers are recommended to make an extension in research object determination. However, the study was conducted in India which results might be different from studies in Nigeria.

Nabi, et al. (2020) examined the relationship between intellectual capital (IC) and corporate performance of the banking industry. This study used econometric models against five years of commercial banks in Bangladesh. This study adopted the Dhaka Stock Exchange (DSE) listed commercial banks, five years of annual data with span from 2012 to 2016. It is considered 28 banks purposively out of thirty. Two banks out of thirty were excluded due to abnormally inconsistent financial performance over the studied period. The empirical study revealed a positive and significant relationship between values added intellectual capital (VAIC) and banks' performances. Further, only capital employed efficiency (CEE) as a component of VAIC has a significant relationship with banks' performance. In addition, structural capital efficiency (SCE) has a very high degree of moderating power on CEE which can be transformed into corporate performance. This study enriches the existing literature of IC and corporate performance and it may be beneficial for the sustainable economic performances of banking industry of Bangladesh.

Theoretical Framework
The human capital theory was introduced by Gary Becker and Theodore Schultz in 1961. The fundamental postulation of human capital theory is that the investments on education and training could add to productivity which has become an increasingly important component of the workforce. Dae-bong (2009) recognized that human capital theory holds competences, skills, data and skills of the personnel that contribute to the performance. He also stated that companies have an incentive to seek productive human capital and to add to the human capital of their existing employees.

Freeman (1976) critiqued the human capital theory by pointing out the difficulty of measuring the future income and the central idea of human capital itself. Freeman stated that not all investments in education guarantee an advance in productivity as judged by employers or the market. In particular, there is the problem of measuring both worker productivity and the future income attached to career openings, except in near-tautological fashion by reference to actual earnings differences which the theory purports to explain.

METHODOLOGY

Expost facto research design was used for this study. Expost facto research is the inquiry that deals with the collection and analysis of data to describe and interpret conditions and also to make discovery and explanation of past events. Expost facto research design is utilized because it helps to establish relationships between two or more variables. Also, it is appropriate for testing the hypotheses of the study and helps to proffer answers to the research questions concerning intellectual capital and return on equity of listed agricultural companies which is the crucial concern of this study.

The panel data to be used in this study was collected from secondary sources from the individual financial reports of the listed agricultural sectors. The population of the study will constitute all the five (5) listed agricultural firms in the Nigerian Stock Exchange as at December 2021 which are Ellah lakes, FTN cocoa processor, livestock feeds Nigeria, Okomu oil palm and Presco oil. The purposive sampling technique was adopted in which four (4) listed agricultural firms in Nigeria were sampled for the purpose of this study.

This study employed panel regression model to identify, explain and estimate the key relationship between intellectual capital and return on equity. The procedure for analyzing the data was the econometric method which makes use of economic hypothesis in combination to estimate the economic variables and statistical tools and to forecast the intended variable. The econometric model can either be a system of a simultaneous equation or single-equation regression model. Correlation analysis is a method of statistical evaluation used to study the strength of a relationship between two, numerically measured, continuous variables (height and weight). Hausman test was used to determine which model is the best suited for this study whether fixed or random effect. The following multiple regression model will be used:

$$ROE_{it} = a_o + a_1 HUC_{it} + a_2 STC_{it} + e_{it}……..(1)$$
Where;
ROA_{it} = Return on equity of firms (depend variable)
HUC_{it} = Human capital of firms
STC_{it} = Structural capital of firms
e_{it} = Error term
a_0 = Constant,
a_1, a_2, = the slope or the co-efficient of the independent variables.
The decision to test the hypothesis of the study is as follows:
If the p-value of the t-coefficient is less than 5% (0.05), the null hypothesis is rejected, otherwise accept.

RESULTS AND DISCUSSIONS

1.1 Descriptive Statistics

	ROE	HUC	STC
Mean	25.74640	8.656932	3.495158
Std. Dev.	0.245778	0.467352	1.046924
Skewness	-5.403312	1.572703	-1.200310
Kurtosis	3.309168	3.545919	3.446685
Jarque-Bera	9.722283	13.87647	4.657347
Probability	0.000000	0.00000	0.00000
Observations	40	40	40

Source: E-Views 10

Table 1.1 presents the descriptive statistics for both the dependent and explanatory variables of the study. The number of observations for the study reflects a value of 40 indicating that the number of observations for the study is made up of a period of 10 years (2011-2020). The table also shows the mean of Return on equity, human capital, structural capital, are: 25.74640, 8.656932, and 3.495158 respectively. One important observation is that both the independent variables and the dependent variable have mean value higher than that of its standard deviation.

Table 1.2: Correlation Matrix

	ROE	HUC	STC
ROE	1	0.21256	-0.03411
HUC	0.21256	1	-0.0008
STC	-0.03411	-0.0008	1

Source: E-Views 10

From table 1.2 the correlation matrix result suggests that there is no multicollinearity among the independent variables of interest with all the value being positive. The possible existence of multicollinearity is further tested through computing the variance inflation factor (VIF). According to Gujarati (2003), there is no consequence of multicollinearity if the mean VIF is less than 10.

Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.18807	2	0.34008

Source: E-Views 10

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In view of the fact that both fixed and random effect tests will be conducted, Hausman test was used to decide the best out of the result. The test will enable the researcher to choose the most appropriate between the fixed and random effect models. With the probability of 0.34008, the random effect was rejected. Therefore, the fixed effect estimator was used to run the regression.

Table 1.4: ROE Panel Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.398399	0.406960	5.893344	0.0000
HUC	0.140084	0.000382	-8.16513	0.0000
STC	6.020005	0.001535	0.03919	0.9688
R-squared	0.466143	Mean dependent var		1.559714
Adjusted R-squared	0.452334	S.D. dependent var		0.561078
S.E. of regression	0.372922	Sum squared resid		4.311193
F-statistic	33.76223	Durbin-Watson stat		1.675986
Prob(F-statistic)	0.000000			

Source: E-Views 10

The Regression table reveals a significant relationship between ROE and human capital but structural capital was insignificant. The estimate of this equation reveals a Postive intercept which stands at 2.398399. This implies that when ROE is zero, all the explanatory variables would stand at 2.398399.

The test of goodness of fit reveals that the estimated relation has a good fit. While both the R^2 and adjusted R^2, which stand at 46% and 45% respectively, revealed that about 46% of total variations in human capital and structural capital is explained by variations in ROE; the f-statistic, which reveals the joint significance of all estimated parameters in predicting the values of human capital and structural capital, are statistically significant with a value of 33.76223 and a p-value of 0.00000.

DISCUSSION OF FINDINGS

Based on the findings of the research, the study is consistent with the research of Shaneeb and Sumathy (2021) and Muthia, et al. (2021) that the relationship between human capital and financial performance is significant, this implies that it is always true that companies that have higher human capital will be more likely to influence its financial performance. This can be seen from the higher training and knowledge it has a positive effect on the company's value. So, if the condition of the

company's human capital is good, the company's performance will be affected. The result of insignificant effect of structural capital and financial performance, shows consistency with the works of Muhammad, et al. (2021), As'ad and Panggabean (2021) and Nabi et al (2020). Even though managers would desire to have a relatively structural capital because that would indicate that the firm is viable and has the ability to meet its future expansion.

CONCLUSION AND RECOMMENDATIONS

The paper evaluates the effect of intellectual capital on financial performance of listed agricultural firms in Nigeria. In agreement with prior evidence from developed countries that show significant linkage between intellectual capital and financial performance, the findings indicate that intellectual capital has significant effect on return on equity of listed agricultural firms in Nigeria, the paper also concluded that a unit increase in human capital will have an increase on return on equity. Even though structural capital has no significant effect on return on equity, a unit increase in structural capital will not increase return on equity. This study revealed based on the model that there is a significant relationship intellectual capital and return on equity of listed agricultural firms during the period under study.

Drawing from our research findings, the recommendations are proffered as follows:
i.   Due to the significant effect of human capital, the management of the Agricultural firms should put great emphasis on human capital investment, by improving employees' quality by continuous training, and also to recruit high-level talents. Also, the management need to construct a perfect employee incentive system and build an innovative work environment to enhance employees' ability of knowledge application.
ii.   The study also recommends that managers of agricultural firms should enhance information transmission, construct a standardized production process, and establish an institutionalized management mode for innovation and cooperation. Meanwhile, the management should pay attention to the accumulation of proprietary knowledge base such as the patent right and information system.

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Appendix

Fiscal Year	Companies	Exchange Sector	ROE	HC	SC
2011	Ftn Cocoa Processors	Agriculture	-10.2196	0.0464	-20.5332
2012	Ftn Cocoa Processors	Agriculture	-20.4974	-3.179	1.3146
2013	Ftn Cocoa Processors	Agriculture	-16.882	-1.2013	1.8324
2014	Ftn Cocoa Processors	Agriculture	-48.1564	-10.5727	1.0946
2015	Ftn Cocoa Processors	Agriculture	-19.0131	-1.6766	1.5964
2016	Ftn Cocoa Processors	Agriculture	-70.9599	-1.3827	1.7232
2017	Ftn Cocoa Processors	Agriculture	-195.8889	-7.1072	1.1407
2018	Ftn Cocoa Processors	Agriculture	-1572.2402	-2.2003	1.4545
2019	Ftn Cocoa Processors	Agriculture	104.7687	-4.6832	1.2135
2020	Ftn Cocoa Processors	Agriculture	60.7413	-6.1645	1.1622
2011	Livestock Feeds	Agriculture	20.0046	2.9042	0.6557
2012	Livestock Feeds	Agriculture	22.7718	4.227	0.7634
2013	Livestock Feeds	Agriculture	12.1838	2.2843	0.5622
2014	Livestock Feeds	Agriculture	12.8116	2.9574	0.6619
2015	Livestock Feeds	Agriculture	9.6427	2.8036	0.6433
2016	Livestock Feeds	Agriculture	7.3015	2.8472	0.6488
2017	Livestock Feeds	Agriculture	-34.596	1.6196	0.3826

2018	Livestock Feeds	Agriculture	-42.393	-0.0566	18.6774
2019	Livestock Feeds	Agriculture	6.7758	2.1307	0.5307
2020	Livestock Feeds	Agriculture	24.2759	52.9362	0.9811
2011	Okomu Oil Palm	Agriculture	20.6403	2.8942	0.6545
2012	Okomu Oil Palm	Agriculture	14.0645	5.2197	0.8084
2013	Okomu Oil Palm	Agriculture	9.2504	6.4394	0.8447
2014	Okomu Oil Palm	Agriculture	6.6863	5.32	0.812
2015	Okomu Oil Palm	Agriculture	21.8099	6.9304	0.8557
2016	Okomu Oil Palm	Agriculture	28.8635	10.5199	0.9049
2017	Okomu Oil Palm	Agriculture	37.3277	18.5168	0.946
2018	Okomu Oil Palm	Agriculture	29.8162	16.2793	0.9386
2019	Okomu Oil Palm	Agriculture	17.305	13.288	0.9247
2020	Okomu Oil Palm	Agriculture	22.3721	18.7421	0.9466
2011	Presco	Agriculture	38.3014	8.8325	0.8868
2012	Presco	Agriculture	20.4123	11.6529	0.9142
2013	Presco	Agriculture	7.693	9.5018	0.8948
2014	Presco	Agriculture	13.0532	23.0389	0.9566
2015	Presco	Agriculture	7.6353	8.0477	0.8757
2016	Presco	Agriculture	41.7035	13.7114	0.9271
2017	Presco	Agriculture	334.3455	15.9406	0.9373
2018	Presco	Agriculture	17.722	14.7254	0.9321
2019	Presco	Agriculture	13.7649	10.5536	0.9052
2020	Presco	Agriculture	16.9458	13.0525	0.9234

Source: Annual Financial reports