EFFECT OF INTELLECTUAL CAPITAL ON FINANCIAL PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN NIGERIA

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Abstract: *The Study determined the effect of intellectual capital on financial performance of listed consumer goods companies in Nigeria. The specific objectives were to examine the effect of human capital efficiency (HCE) on return on assets (ROA) of listed consumer goods companies in Nigeria, evaluate the effect of structural capital efficiency (SCE) on return on assets (ROA) of listed consumer goods companies in Nigeria and ascertain the effect of capital employed efficiency (CEE) on return on assets (ROA) of listed consumer goods companies in Nigeria. The independent variable intellectual capital proxied by human capital efficiency (HCE), structural capital efficiency (SCE) and capital employed efficiency (CEE) while dependent variable financial performance proxied by return on assets (ROA). The ex-post facto research design which made use of secondary data drawn from the annual report and accounts of four (4) firms in listed consumer goods companies in Nigerian economy covering a period of ten (10) years from 2010 to 2019 both years inclusive. The theory in which this study pinned on was resource-based theory and knowledge-based theory. The E-views version 9.0 software statistical package was used to run the Panel ordinary least square (OLS) for the study. The multiple regression model was applied in determining the extent of the effect of independent variable (intellectual capital) on dependent variable (financial performance) of companies under consideration. The result of the regression analysis revealed that human capital efficiency (HCE) has positive and significant effect on return on assets (ROA) while structural capital efficiency (SCE) and capital employed efficiency (CEE) have negative and insignificant effect on return on assets (ROA) of listed consumer goods companies in Nigeria. Based on the findings, the researcher recommended that the human capital efficiency has been shown to be the key driver of value creation especially in return on assets, efforts should be made to grow intellectual capital of firms by first recruiting very competent staff, train and motivate them. Also, firms should invest in education and relevant programmes that can help increase in their structural capital by harnessing information technology.*

Keywords: Human capital efficiency, Structural capital efficiency, Capital employed efficiency, Return on Assets, Intellectual capital and Financial Performance.

Introduction

The accounting profession is currently more than ever being challenged to reinvent itself. This move emanates from the inherent deficiencies of conventional accounting, which has failed to recognize the intangibles/knowledge acquired by organization as non-current assets. Therefore, there is need for a more elaborate platform of financial reporting that could capture knowledge and other Intellectual Capital (IC) Components (Human, Structural and Relational/Customer Capital) in quantitative terms in financial information for informed decision-making. The continuous exclusion of these IC components implies the neglect of the enormous intangible values and investments incurred by firms in the acquisitions and development of intellectual properties (Onyekwelu and Ubesie, 2016).

This practice has aptly culminated in the undervaluation of firms and the often-huge gap that often exists between book value and market value of firms. The reward earned by firms through their investment in intellectual properties is often attributed to intellectual capital and this is argued to be a major value creator. Saeed, et al (2013) submit that Intellectual Capital accounts for the enormous gap between the market value and book value of firms in the knowledge-based and technology driven industry such as the pharmaceuticals industry and this they therefore attributed the missing value in the financial statements to 'Intellectual Premium' order wise 'Intellectual Capital'.

Banimahd, et al (2012) submit that knowledge-based economy has emerged in the 1980's due to the investments, creation and use of high technologies and globalization. Ahangar (2011) posits that the fast expansion of science, technology and globalization have altered the pattern and structure of production system as the processes are becoming increasingly driven by technology, knowledge, expertise and relationships with stakeholders and that innovation-driven economy could be attributed and described as "Intellectual Capital" (IC). The IASB through IAS 38 on Intangible Assets and the subsequent IFRS 3 on Business combinations and IAS 36 on Impairment of Assets applied by IFRS adopting countries and the treatment of goodwill, research and development and other identifiable intangible assets all give credence to the need for incorporating Intellectual Capital in financial reporting (Vafaei, et al, 2011).

Berzkalne and Zelgalve (2014) argue that though intellectual capital and knowledge assets are difficult to discern and quantify, their results will none the less be reflected in the company's greater productivity, efficiency and overall profitability.

Statement of the Problem

The justification or otherwise for the place of knowledge also known as intellectual capital in driving the earnings and indeed the other corporate value indices of firms has constituted a challenging academic puzzle in the past few decades. Some scholars have described intellectual capital as being a key driver of corporate value enhancement. Yet others submit that intellectual capital provides a platform through which firms enjoy competitive advantage, well and above their contemporaries. This study becomes very imperative, as there exists the obvious gap created by lack of locally groomed study that could serve the peculiar need of listed consumer goods industry and more importantly in an era when knowledge is considered key and fundamental to corporate value creation and hence the justification for this study. These problems have necessitated this research work on effect of intellectual capital on financial performance of listed consumer goods companies in Nigeria.

Objectives of the Study

The main objective of this study is to determine the effect of intellectual capital on financial performance of listed consumer goods companies in Nigeria.

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The specific objectives are:

1. To examine the effect of human capital efficiency (HCE) on return on assets (ROA) of listed consumer goods companies in Nigeria.
2. To evaluate the effect of structural capital efficiency (SCE) on return on assets (ROA) of listed consumer goods companies in Nigeria.
3. To ascertain the effect of capital employed efficiency (CEE) on return on assets (ROA) of listed consumer goods companies in Nigeria.

Statement of Hypotheses

Based on the specific objectives stated above, the following null (H_o) were formulated for this study.

H_{o1}: Human capital efficiency (HCE) has no significant effect on return on assets (ROA) of listed consumer goods companies in Nigeria.

H_{o2}: There is no significant effect of structural capital efficiency (SCE) on return on assets (ROA) of listed consumer goods companies in Nigeria.

H_{o3}: Capital employed efficiency (CEE) has no significant effect on return on assets (ROA) of listed consumer goods companies in Nigeria.

Review of Related Literature

Concept of Intellectual Capital

Intellectual Capital(IC) has been widely acknowledged as that innate attribute usually acquired by a firm which drives it on the wheel of value creation, value addition and value sustainability. This concept of Intellectual Capital generally can be said to have emanated from describing the 'dynamic effects of individuals: the 'Intellect' (Onyekwelu and Ubesie, 2016).

Sardo and Serrasqueiro (2018) define intellectual capital as competence multiplied by commitment, meaning that intellectual capital equals the knowledge, skills, and attributes of each individual within an organization multiplied by the person's willingness to work hard.

Nhoh, et al (2020) explain intellectual capital as the accumulation of all knowledge, information, intellectual property, experiences, social networks, capabilities and competencies that enhance organisational performance not only as held by individuals, but also as embedded in business processes. They added that a comprehensive definition describing intellectual capital "as the holistic or meta-level capability of a company to coordinate, orchestrate and deploy its knowledge resources toward creating value in pursuit of its future vision". They continue that over the past years, the concept of intellectual capital has been defined in multiple ways, often resulting in a lack of consensus regarding its components. They finalized it by saying that a widely applicable definition of intellectual capital should have three dimensions: human, organisational and social capital.

William, et al (2019) see intellectual capital as the combined intangible assets of the market, intellectual property, human-centred and infrastructure which enable the company to function. They added that intellectual capital is the possession of knowledge, applied experience, organizational technology, customer relationships and professional skills that provide the firm with a competitive edge in the market.

Loo-see (2018) describes intellectual capital as the possession of the knowledge, applied experience, organizational technology, customer relationships and professional skills that provide a competitive advantage in the marketplace.

Maditinos, et al (2011) argue that intellectual capital can be traced back to those "hidden assets" which although not recognised in financial statements leads organisations to obtain a competitive advantage. It is an important activity for organizations which want to be efficient on the market and thus to obtain sustainable competitive advantage.

Measurement for variables for the study

Human Capital Efficiency (HCE)

Human capital refers to the acquired skills, knowledge, and abilities of human beings. The underlying concept is that such skills and knowledge increase human productivity

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and that they do so enough to justify the costs incurred in acquiring them (Loo-see, 2018).

Although Becker (1964) is most recognized for the theory of human capital, Schultz (1963) was also one of the first theorists to identify the significance of human capital and its economic value. Schultz (1963) sees it as education and other forms of human capital investment increase output in a variety of ways: by generating new ideas and techniques that can be embodied in production equipment and procedures; by equipping workers to utilize the new production techniques and initiate changes in production methods; by improving the links among consumers, workers and managers; and by extending the useful life of the stock of knowledge and skills that people embody.

Onyekwelu and Ubesie (2016) indicate that Human Capital Efficiency (HCE): This defines the ratio of total value added to total salaries and wages. Human capital (HC) is interpreted as employee expenses and human capital efficiency (HCE) is calculated by dividing VA (added value) with HC (Human Capital).

Thus: VA/HC

Structural Capital Efficiency (SCE)

Structural capital belongs to the organization as a whole. It can be reproduced and shared and is entitled to legal rights of ownership. For example, technologies, inventions, data publications, and processes can be patented, copyrighted, or shielded by trade secret laws. Also among the elements of structural capital are strategy and culture, structures and systems, organizational routines, and procedures-assets that are often far more extensive and valuable than the codified ones (Wang, 2011).

Loo-see (2018) says that structural capital has two purposes: to codify bodies of knowledge that can be transferred in order to preserve the recipes that might otherwise be lost, and to connect people to data, experts, and expertise, including bodies of knowledge, on a just-in-time basis. Because knowledge sharing is dependent on various mediums of transmission, a proper organizational

structure needs to be in place. Therefore, structural capital is incorporated into the theoretical framework of intellectual capital. It comes down to the importance of connecting people with people and people with information through an effective and efficient framework of communication channels. In relating structural capital to the theory of intellectual capital, knowledge should flow quickly and easily between functions & communication networks, corporate yellow pages and knowledge databases allow a company to put its best people on the front line while still keeping their expertise available to the entire organization.

It becomes important to understand how intellectual capital refers to knowledge and its importance in an organization. This has been defined as experience and information that can be communicated and shared. Knowledge management is the facilitation of processes for creating, capturing, sharing, storing, renewing, deploying and leveraging knowledge for enhanced organizational performance. In managing and controlling the alliance (human and structural Capital), human resource practices and active monitoring of knowledge flows and information requests are key to keeping intellectual capital protected while effectively contributing to the collaborative activity (Xu and Liu, 2020). Structural capital becomes a significant foundational component of intellectual capital because it provides the framework and patterns for the transmission of knowledge. In order for organizations to maximize their human capital, they need to assess their investments made in building the skills central to their competitive advantage.

Onyekwelu and Ubesie (2016) add that Structural Capital Efficiency (SCE) is the ratio indicates how much of value added was generated by structural capital.

Structural Capital Efficiency (SCE) = Structural Capital (SC)/ Value Added (VA).

Capital Employed Efficiency (CEE)

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Capital Employed (CE) is all material and financial assets. Capital employed efficiency (CEE = VA / CE) and Intellectual Capital Efficiency (ICE = HCE + SCE) are indicators which show how efficiently intellectual capital has created value. They are also indicators which show how much VA is created on each monetary unit invested in CE.

Onyekwelu and Ubesie (2016) say that capital employed efficiency (CEE) ratio will be used to calculate the total value added to book value of assets and wages. Capital Employed (CE) will be interpreted as financial capital and capital employed efficiency (CEE) is calculated by dividing value added (VA) with capital employed (CE). That is,

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

Value Added Intellectual Coefficient (VAIC)

Baye, et al (2014) say that the Value Added Intellectual Coefficient™ (VAIC™) methodology developed by Pulic (1998) forms the underlying measurement basis for the independent variable in this present study. In his words VAIC™ is an analytical procedure designed to enable management, shareholders and other relevant stakeholders to effectively monitor and evaluate the efficiency of VA by a firm's total resources and each major resource component. VAIC™ is a composite sum of two indicators these are: Capital Employed Efficiency (CEE) – indicator of VA efficiency of capital employed and Intellectual Capital Efficiency (ICE) – indicator of VA efficiency of company's Intellectual Capital base. Intellectual Capital Efficiency is composed of (a) Human Capital Efficiency (HCE) – indicator of VA efficiency of human capital; and (b) Structural Capital Efficiency (SCE) – indicator of VA efficiency of structural capital. The value added (VA) are newly created value, calculated as follows VA = Operating Profit + Employee costs + depreciation + Amortization or VA = output (Total Income) – input (All costs of purchasing goods and services from the market). The

human capital (HC) is overall employee expenses (salaries, education, and training); in this analysis considered an investment, not cost, and thus not substantial part of input any more. The human capital efficiency (HCE = VA / HC) and Structural Capital (SC) are results of Human Capital's past performance (organisation, licenses, patents, image, standards, and relationship with customers). Therefore, structural capital efficiency (SCE = SC / VA). Capital Employed (CE) is all material and financial assets. Capital employed efficiency (CEE = VA / CE) and Intellectual Capital Efficiency (ICE = HCE + SCE) are indicators which show how efficiently intellectual capital has created value. They are also indicators which show how much VA is created on each monetary unit invested in capital employed. Value Added Intellectual Coefficient (VAICTM = ICE + CEE). The two sub-components of VAIC™ form the independent variables in our research. They indicate the value creation efficiency of all resources (sum of the previous indicators). It expresses the intellectual ability of a company or firm.

Onyekwelu and Ubesie (2016) say that value added intellectual coefficient (VAIC) is the sum of human capital efficiency (HCE), structural capital efficiency (SCE) and capital employed efficiency (CEE).

Thus: VA= W+I+DP+DIV+T+R...................(1)

Where:

VA = Value Added measured by addition of wages and salaries; interest expenses; depreciation expenses; dividends; corporate taxes and retained profit for the year.

It is calculated by:

VAIC = HCE + SCE +CEE...(2)

Where:

HCE= Human Capital Efficiency, SCE = Structural Capital Efficiency and

CEE= Capital Employed Efficiency.

Return on Assets (ROA)

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Return on Assets (ROA) is a financial ratio that shows the percentage of profit a company earns in relation to its overall resources. It is commonly defined as net income divided by total assts. Net income is derived from the income statement or statement of comprehensive income of the company and is the profit after taxes (Enekwe, 2012).

Emekekwue (2008) describes return on assets as a ratio which seeks to measure the amount of profit generated from the entire assets of the firm. It is express as

$$\frac{\text{Profit before tax}}{\text{Total Assets}}$$

Theoretical Framework

This section investigates the relevant theories in this research work, such as:

Institutional Theory and Legitimacy Theory

Among the most widely used theories, institutional theory and legitimacy theory are the common ones (Adams, et al, 2016; Ntim, et al, 2017 and Zappettini & Unerman, 2016). Institutional theory is used to understand the frameworks used by different companies and organizations in firm-specific industry contexts (Adams et al., 2016). This theory explains how organizations use the similar type of practices and structures to make them visible as an abiding company in the eyes of the regulatory bodies and to gain substantial legitimacy which is connected to the legitimacy theory as well. Carpenter and Feroz (2001) identified the relationship of adopting a particular framework by a company with respect to its competitors that stems from pressures from the parties external to the business environment, the practice which they linked with institutional isomorphism.

Another important assumption of this theory is that companies adopt new standards and frameworks in order to gain external approval in the form of reduced cost of capital and a balanced costs and benefits position (Clegg & Hardy, 1999). Therefore, we used the insights from the institutional theory and legitimacy theory so that we can relate the performance of a firm with an extensive disclosure of intellectual capital in their corporate annual reports.

Agency Theory

The Agency Theory propounded by Jensen and Meckling (1975) has to do with the relationship between the principal (shareholders) and the agent (company's manager). They define the agency cost as a cost that arises between the principals (stockholders) and the agents (management). Where the principals hire and delegate the agents with a certain power to maximize the wealth of the principals. Agency theory is used in order to identify the factors that motivate managers in today's corporations that have dispersed ownership structures. One of the important issues in agency theory is corporate governance and how it affects the disclosure of forward-looking information in the corporate annual reports. Kaur and Lodia (2014) success or failure in today's firms is largely affected by the decisions taken by the decision-makers. Therefore, we can relate that the managers in big companies have the incentive of disclosing information related to the intellectual capitals of the firm for the best interest of the principals (shareholders) of the firm. Also, in line with agency theory, information asymmetry can be appeased through better quality corporate reporting and disclosure (Ascioglu, et al, 2012; Boubaker, et al, 2015). Rahman, et al. (2019) studied intellectual capital reporting in the context of Bangladesh and linked it with agency theory. They used the internal factors such as board size, independent directors, ownership structures and other governance variables and confirm that these variables positively affect the intellectual capital disclosures in the annual reports of the firm. Thus, an effective corporate governance structure helps to solve agency problems and increase the strength of the internal control of the firm by reducing information asymmetry through voluntary

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corporate disclosures (Jensen & Meckling, 1976). Hence, this study has incorporated agency theory to intellectual capital disclosure and firm performance analysis.

Static Theory

Tamara and Bojan (2017) say that the static theory of intellectual capital was based on which the corporate value is not derived directly from any of the components of intellectual capital, but from their interaction, whereby the nonexistence of any component prevents a firm to use the potential of transforming its intellectual capital into the corporate value. The basic concept of the static theory of intellectual capital is very simple - it is based on the wealth of knowledge embedded in individuals and organizations, and the need to mutually connect these systems in order to improve performance.

Dynamic Theory

The relationship between the knowledge component and the resources component in the produced outputs has changed significantly, thus contributing to the change of the source of competitive advantage. In the past, advantages were based on the market dominance or organization of the process of mass production, while in modern circumstances competitive advantage lies in the brand and reputation, patents and standards, relationships with employees, suppliers and customers. Those sources of competitive advantage represent various forms of intellectual capital, which could create huge differences between the book value of a firm and its market value, which also encompass a value of the undisclosed intellectual capital.

Tamara and Bojan (2017) added that the dynamic theory of intellectual capital was based on which it is necessary to completely eliminate the relational capital from the structure of the intellectual capital, and to replace structural capital with the theory of the system. By accessing intellectual capital through the theory of the system, rather than structural capital, the organization is able to recognize its connections. The theory of the system connects individuals to the processes, and in turn with the organization, thus enabling the verification of compliance that every individual and process in the organization is associated with the respective strategic plans and business objectives of the organization. Given that the intellectual capital environment promotes the diffusion of knowledge in order to improve performance, information and feedback from consumers should always be available and visible in the organization in which a system of intellectual capital is set up. Hence, in an intellectual capital environment, competitive advantage creates the organizational knowledge and systems designed to access that knowledge. Therefore, the dynamic theory is based on the constant exchange of knowledge between the human capital and designed systems.

Resource-based Theory

The resource-based theory has taken a prominent place in economic theory in the late 20th century, when the focus of strategic research of the sources of competitive advantage shifted from industry, i.e. external environment to the specific characteristics of the organization i.e. internal environment (Tamara & Bojan, 2017). The central premise of the resource approach is that the competitiveness of an organization is based on its resources and capabilities (Peteraf & Bergen, 2003). The development of the resource-based theory of the firm is primarily focused on establishing a connection between resources and competitiveness, as well as examining the impact of these connections on creating sustainable competitive advantage and improving firm's performances (Krstić & Sekulić, 2016). The resource-based theory of the firm observes a strategy as an instrument for the alignment of resources and capabilities of a firm with the requirements of the external environment (Rađenović & Krstić, 2017). The resource-based theory starts with two assumptions in the analysis of the sources of competitive

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advantage: First, firms within a particular industry or group can be heterogeneous in terms of strategic resources they control; second, these resources need not be perfectly mobile between firms, and thus heterogeneity can be long-lasting. The resource model of the firm examines the implications of these two assumptions in the analysis of the sources of sustainable competitive advantage. Therefore, the heterogeneity of resources determines the heterogeneity between firms. It can be said that internal resources are the strength of the firm, which it uses for defining and implementing strategies. The resources of a firm can be classified into three major categories (Barney, 1991): Material resources (physical capital), Human resources (human capital) and Organizational resources (organizational capital). Of course, not all aspects of the physical, human and organizational capital of a firm are strategically significant resources to create and sustain competitive advantages - some may pose obstacles to the implementation of valuable strategies, some can lead to reduced efficiency and effectiveness of implemented strategies, and some have no influence the strategic processes of a firm. In this sense, in terms of the resource-based theory of the firm, only those physical, human and organizational resources are important which enable firms to design and implement strategies that improve their efficiency and effectiveness (Wernerfelt, 1984). A firm has a competitive advantage when implements a strategy of value creation that is not at the same time applied by any current or potential competitors, and it achieves a sustainable competitive advantage when apart from this criteria, the competitors are not able to replicate the advantages of this strategy. Due to the fact that a firm is a set of different resources that affect the performance of a particular firm through interaction with other resources, and the direction of this causal link is vague, it is difficult to determine how individual resources contribute to the success of a firm, without taking into account the interdependence with other resources. Development of the

resource-based theory differentiates two directions: static, which is focused on the static aspects of resource analysis by understanding the way in which a particular resource contributes to creating and sustaining a competitive advantage; and dynamic, which seeks to connect the firm development with the process of improving the effects of the resource usage the process of the use of resources should be directed towards those activities that can have a positive impact on the growth and development of the firm, and through greater creativity in choosing, combining and using resources to achieve the greatest possible synergy effects and desirable competitive advantage.

Knowledge-based Theory

A sustainable competitive advantage is based on the knowledge of a firm as one of the main components of intellectual capital (Hunter, 2002). Competitive capability is largely dependent on the capability of an organization to develop, differentiate, adopt and disseminate its knowledge base. Knowledge in an organization is a resource on which a firm can build and maintain the core competencies that, if being adopted, enable it to survive and prosper in a competitive world (Hunter, 2002). The knowledge-based theory puts emphasis on knowledge as a resource which is difficult to imitate, which differentiates and creates a competitive advantage (Leonard, 1992). The knowledge-based view of the firm distinguishes four dimensions of set of skills: knowledge and skills of employees, technical systems, management systems and values and norms associated with different types of personalized and embedded knowledge, as well as, the processes of knowledge creation and control. In addition, Grant highlights the fact that knowledge is "the critical input in the production and the primary source of value" (Grant, 1996). Spender (1996) organization is seen as a lasting alliance between independent entities that create knowledge, regardless of whether they are individuals, teams, or other organizations, with the material resources subordinated to the provided services. This suggests that in

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the constantly changing environment, the most successful firms are those which produce original knowledge, spread it within the organization and quickly transform it into innovative products. Liebeskind (1996) believes that firms as institutions have a key role in creating and sustaining a competitive advantage by protecting useful and valuable knowledge. In particular, given that the intellectual property rights are insufficiently regulated, but also expensive to propose and implement, firms are able to use a range of organizational arrangements that are not available on the market to protect the value of knowledge. Hence, firms can in many ways prevent the expropriation of knowledge, and reduce the visibility of knowledge and its products, thus protecting them from imitation. In this way a firm can achieve the "possession rights" which are also valuable, if not more valuable, than the limited property rights of knowledge required by the law. Therefore, the uniqueness, which is the key to competitive advantage, actually depend on the adoption of the various protective arrangements by firms. If the core knowledge is a main strategic asset of an organization, then its main tasks are to improve the existing knowledge and to create new core knowledge (Viedma, 2007). At the same time, creation and improvement of core knowledge require the capabilities of organizational learning, including the corresponding structure of learning and information systems, where the valuable knowledge can only be obtained through a systematic and repeated comparison to the processes and core competencies of "world class" competitors in the same business segment.

However, this study was anchored on both the resource-based theory and knowledge-based theory because of their connection on the research topic.

Empirical Review

Several empirical works have been conducted by various researchers.

Onyekwelu and Ubesie (2016) evaluated effect of intellectual capital on corporate valuation of firms quoted in Nigeria. The study adopted the Panel Research Design as used Time Series and Cross-Sectional Data. Data covered a ten- year period (2004-2013). Simple Random Sampling was employed in selecting firms for this study. Data were sourced from the firms' annual financial statements using content analysis approach. Market valuation data were sourced from the Nigerian Stock Exchange. Intellectual Capital (Independent Variable) was measured using Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) while corporate valuation (dependent variable) was measured by market to book value ratio (M/BV) and earnings per share (EPS). The study adopted the Value Added Intellectual Coefficient (VAIC) Model. The multiple regression and correlation analysis was used on the data at 5% level of significance. E-View Statistical Tool version 8.0 was used in the analysis. The results reveal that Human Capital Efficiency has a positive and significant effect on Market/Book Value. SCE has a negative and insignificant effect on M/BV; CEE has negative and significant effect on M/BV; positive and insignificant effect on EPS.

Rashedul and Mohammad (2018) evaluated the intellectual capital and firm performance, evidence from the financial sector in Bangladesh. The quantitative data are collected from 49 financial institutions listed in the Dhaka Stock Exchange (DSE) for the year ending 2012 and 2013. Intellectual capital is measured using Value Added Intellectual Coefficient (VAIC). The impact of both the current and past years' VAIC on firm performance is measured, along with the effects of its three components - human capital efficiency (HCE), capital employed efficiency (CEE), and structural capital efficiency (SCE). The stepwise regression results indicate a positive and significant relationship between current year VAIC and two measures of firm performance (ROA, ROE) while past years' VAIC is found insignificant for all three measures of firm performance. HCE for the current year is found to be

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the most significant contributor toward firm performance among all the three components of VAIC, having a substantial positive relationship with all three measures of firm performance. SCE of the current year significantly affects ROA and ROE whereas CEE is found to be significant only for ROA. While measuring past years' effect on performance, only HCE has been found to have a negative influence on current year's revenue growth (RG). Faizi, et al (2020) determined the measuring the impact of intellectual capital on the financial performance of the finance sector of India. This study was conducted on Bombay Stock Exchange's finance index has been taken for a period ranging from 2009 to 2018, and the Value Added Intellectual Coefficient (VAIC™) methodology has been used to measure the intangible aspects of these firms. The results reveal that Value Added Intellectual Coefficient has an insignificant association with the profitability and productivity of the sample companies. While among the components of Value Added Intellectual Coefficient, the capital employed efficiency has a significant positive relationship only with the profitability of the financial sector. In the case of productivity, all the components of intellectual capital have an insignificant effect on the financial companies of India. The SCE remain insignificant for all the financial performance measures, whereas human capital efficiency is substantial only for enhancing the return on assets of the sample companies. William, et al (2019) investigated the impact of intellectual Capital on firms' financial performance and market value, empirical evidence from Italian listed firms. In this study, the Valued Added Intellectual Coefficient (VAIC) is employed as a measure of intellectual capital to investigate the relationship between intellectual capital, firms' financial performance and market value. The empirical investigation is developed by using data drawn from a sample of 135 Italian listed companies for the period from 2008 to 2017 and performing different Ordinary Least Squares (OLS) regression models. The findings suggest

that, when taken in its aggregated form, intellectual capital exerts a positive impact on firms' financial performance measured as firms' profitability and growth in revenues as well as on market value. However, when considering its components, only Human Capital efficiency shows a positive effect on firms' financial performance while Structural Capital efficiency and Capital Employed efficiency exhibit a negative effect.

Xu and Liu (2020) investigated the impact of intellectual capital on firm performance, a modified and extended VAIC model. This study covers the Korean manufacturing firms over the period 2013–2018. The modified and extended Value Added Intellectual Coefficient (VAIC) model was adapted to more accurately measure intellectual capital, and firm performance was systematically and comprehensively measured in three distinct parameters: profitability, productivity and market value. Our regression results show that physical capital was the most influential factor to firm performance; human capital was viewed as a performance enhancing measure; structural capital had no significant impact on firm performance; and innovation capital and relational capital hurt a firm's profitability.

Rahman, et al (2020) examined the impact of intellectual capital disclosure on firm performance, empirical evidence from pharmaceutical and chemical industry of Bangladesh. In this study, 21 listed pharmaceutical and chemical companies have been selected as sample for 2016 and 2017. The return on assets and return on equity have been used as the proxy variable of firm performance. In this study, content analysis is performed to assess the level of disclosure regarding intellectual capital and pooled cross-sectional analysis is used to assess the relationship between intellectual capital disclosure (ICD) and firm performance. The study has found a positive and significant relationship between intellectual capital disclosure (ICD) and firm performance while all the components of intellectual capital disclosure (ICD) namely internal capital disclosure,

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external capital disclosure, and human capital disclosure are also positively and significantly associated with firm performance.

Nhoh, et al (2020) described the effects of intellectual capital on information communication technology firm performance, a moderated mediation analysis of environmental uncertainty. This is particularly crucial for firms in the high- tech or service sectors in Nigeria. Intellectual capital dimensions, including human, organisational and social capital, are key to developing outstanding performance. This study involved a survey of 350 information communication technology (ICT) firm's directors and managers, which was used to analyse the impacts of intellectual capital dimensions on firm performance, the indirect effects of organisational capital on performance via human and social capital, and the moderating role of environmental uncertainty. They found that the human and social capital mediated significantly the relationship between firm performance and organisational capital, and the environmental uncertainty moderated significantly the relationship between intellectual capital dimensions and firm performance.

Methodology

The research design adopted by this study is the *Ex-Post Facto design*. The reason for adopting ex-post facto research design was because the study involves events which have taken place or already existed and cannot be manipulated. The researcher used the secondary source of data gathered from annual reports and accounts or financial statements of selected companies from listed consumer goods companies in Nigeria to compute all the variables (independent and dependent) for this study period of ten (10) from 2010 to 2019 both years inclusive. This study was focused on the listed consumer goods companies in Nigeria and they were total of twenty-eight (28) companies of listed consumer goods companies in Nigeria. But, out of these twenty - eight (28) companies, only four (4) companies were selected for the study. The four (4)

companies selected under listed consumer goods companies in Nigeria were Dangote flour mills Plc, Flour mills Nigeria Plc, Honeywell flour Plc and Cadbury Nigeria Plc. The sampling technique that was used for the selection of the above companies for this study was Non-Probability or Purposive Sampling which is convenience or accidental sampling technique (Onyekwelu, 2015). The Non-probability or Purposive (convenience or accidental) sampling technique was used for this study because it is very convenient to the researcher for collection of data from the Nigerian Stock Exchange (NSE) and internet based on irregularity of data. The econometric method adopted for this study was Ordinary Least Square (OLS) method of estimation. The technique was adopted because of it property of Best Linea Unbaised Estimate (BLUE). The econometric technique employed was pool panel data generated for the period of ten (10) years covering four (4) selected from the listed consumer goods companies in Nigeria. The choice of the pool panel data analysis was to enable us aggregate the cross sectional dimension of the whole variable included in the model so as to determine the effect of the independent variable on the dependent variable. The descriptive analysis was used in the study to describe relevant aspects of the intellectual capital and provide detailed information about each relevant variable. The regression analysis was also used for multiple regression in order to known the effect of each independent variable on dependent variable and to assess the combined or overall effect of independent variable (intellectual capital) on dependent variable (financial performance) of listed consumer goods companies in Nigeria. The researcher also used E-Views 9.0 Statistical Software to run the multiple regressions for this study.

Model Specification

To achieve the objectives set out for this study, the following models were used to enable us estimate the effect of independent variable on the dependent variable. This provides us with the opportunity to test for the stated

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hypotheses with a view to determining the acceptability or unacceptability of the hypothesis, offering us a statistical ground to draw conclusion. The choice of ordinary least square (OLS) for this research work is guided by the fact that it computational procedure is simple and the estimates obtained from this procedure has optimal proprieties which include: linearity, Unbiasedness, Minivariance and Mean square error estimation (Koutsoyianis, 2003). In carrying out this research work on the effect of intellectual capital on financial performance, the researcher developed a regression model in such ways that it addressed each of the objectives of the study, as such

$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots\ldots + U_t$

Where:

Model

$$ROA_{ij} = f(HCE_{ij}, SCE_{ij}, CCE_{ij}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$
$$ROA_{ij} = \beta_0 + \beta_1 HCE_{ij} + \beta_2 SCE_{ij} + \beta_3 CCE_{ij} + U_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. \quad (2)$$

Where:

ROA = Return on Assets was measured by Profit after tax divided by total assets.

HCE = Human capital efficiency was measured by value added (VA) divided by human capital (HC).

SCE = Structural capital efficiency was measured by structural capital divided by value added (i.e. Structural capital (SC) =Value added (VA) - Human capital (HC)

CEE = Capital employed efficiency was measured by value added (VA) divided by capital employed (CE).

VA = Value Added measured by retained profit (Profit after tax) for the year.

HC = Human capital is measured by employees' benefits (Staff training).

$\sigma_0, \alpha_0, \mu_0, \beta_0$ and ρ_0. = Intercept or conctant term.

$\beta_1 \beta_2$,.

= Slope or Coefficient of the independent variables.

Y = Dependent variable of company

X = Independent variable of company

β_0 = Intercept for X variable of i company

β_1 - β_4 = Coefficient for the independent variables X of companies, denoting the nature of the relationship with dependent variable Y (parameters)

U_t = Error term

The VAIC model was adopted for this study as earlier stated. This choice of this model is citied in line with previous study of Berzklane and Zelgalve, 2014. The model was specified in such a way that it addresses all the objectives.

U_t = Stochastic term or error term.

i = time dimension of the series and it ranges from 1,2,3,…………T and T = 10

j =cross-sectional dimension of the series and it ranges from 1,2..J and J=4

Discussion of Findings

<Table 1>

The descriptive Statistics table above shows that capital employed efficiency (CEE) has the highest mean value while structural capital efficiency (SCE) has the lowest value of mean. Also, the low standard deviation of structural capital efficiency (SCE) implies that it does not deviate so much from the mean while the standard deviation of capital employed efficiency (CEE) substitution are relatively high implying much deviation from their respective means which is also reflected in the squared deviation figures. The table further indicates that the observed distribution for human capital efficiency (HCE); structural capital efficiency (SCE) and capital

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employed efficiency (CEE) have skewness coefficients which estimate the asymmetry of the distribution of time series data around its mean of -1.955824, -1.564564 and 6.084868 respectively. The kurtosis coefficient, which measures how peak or flat the distribution of series for human capital efficiency (HCE); structural capital efficiency (SCE) and capital employed efficiency (CEE) were 9.395330, 13.89217 and 38.02563 respectively. The implication of the result was that the observed distribution of for human capital efficiency (HCE); structural capital efficiency (SCE) and capital employed efficiency (CEE) were normally distributed. Jarque-Bera Statistic also confirmed this outcome with significant values of 0.000000 for human capital efficiency (HCE); structural capital efficiency (SCE) and capital employed efficiency (CEE).

<Table 2>

The regression analysis above shows that R-Squared is 87.34% of the variations in return on assets (ROA) of listed consumer goods companies in Nigeria were caused by level of human capital efficiency (HCE); structural capital efficiency (SCE) and capital employed efficiency (CEE) while 12.66% of the variation in return on assets (ROA) were affected by other factors outside our model. The adjusted R-Squared which indicates a figure more than 50% implies that human capital efficiency (HCE); structural capital efficiency (SCE) and capital employed efficiency (CEE) were the major determining factors of return on assets (ROA) of listed consumer goods companies in Nigeria. The Durbin-Watson Statistic is 1.114644 while F-Statistic is 11.03923 at P-value of 0.000000.

From the regression analysis table above indicates that t-calculated of human capital efficiency (HCE) is 6.565190 greater than critical value of 2.0000 while P-value indicate a figure of 0.0000 less than 5% which is level of significance. This implies that human capital efficiency (HCE) has positive and significant effect on return on assets (ROA). So, the researcher rejects null hypothesis (H$_o$) and accepts the alternate hypothesis (H$_i$) of hypothesis one which states that human capital efficiency (HCE) has significant effect on return on assets (ROA) of listed consumer goods companies in Nigeria. So, human capital efficiency (HCE) is the major determining factor for return on assets (ROA) of listed consumer goods companies in Nigeria.

Also, the t-calculated of structural capital efficiency (SCE) shows a value of –0.952184 < 2.0000 while P-value indicate a figure of 0.3505 greater than 5% which is level of significance. This means that structural capital efficiency (SCE) has negative and insignificant effect on return on assets (ROA) of listed consumer goods companies in Nigeria. In this case, the researcher rejects alternate hypothesis (H$_i$) and accepts the null hypothesis (H$_o$) of hypothesis two which states that there is no significant effect of structural capital efficiency (SCE) on return on assets (ROA) of listed consumer goods companies in Nigeria. So, structural capital efficiency is not the major determining factor for return on assets (ROA) of listed consumer goods companies in Nigeria.

Finally, the regression analysis table above indicates that t-calculated of capital employed efficiency (CEE) is -0.567501 less than the critical value of 2.0000 while P-value indicate a figure of 0.5756 greater than 5% which is level of significance. This implies that capital employed efficiency (CEE) has negative and insignificant effect on return on assets (ROA). So, the researcher rejects the alternate hypothesis (H$_i$) and accepts null hypothesis (H$_o$) of hypothesis three which states that capital employed efficiency (CEE) has no significant effect on return on assets (ROA) of listed consumer goods companies in Nigeria. So, capital employed efficiency is not a major determining factor for return on assets (ROA) of listed consumer goods companies in Nigeria.

So, the test output described to the results and the emerging multiple regression equation in the table above is as:

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$$(ROA)_{yt} = 0.006242 + 0.028221(HCE)_{yt} - 1.001035(SCE)_{yt} - 9.78E\text{-}06(CEE)_{yt} + \sum i$$

Summary of Findings

The findings from the specific objectives of this study are:

1. That human capital efficiency (HCE) has positive and significant effect on return on assets (ROA) of listed consumer goods companies in Nigeria. This implies that any increase in human capital efficiency will also result to an increase in financial performance of listed consumer goods companies in Nigeria that is profit generation and vice versa.

2. That structural capital efficiency (SCE) has negative and insignificant effect on return on assets (ROA) of listed consumer goods companies in Nigeria. This implies that any increase in structural capital efficiency will also result to a decrease in financial performance of listed consumer goods companies in Nigeria that is profit generation and vice versa.

3. That capital employed efficiency (CEE) has negative and insignificant effect on return on assets (ROA) of listed consumer goods companies in Nigeria. This implies that any increase in capital employed efficiency will also result to a decrease in financial performance of listed consumer goods companies in Nigeria that is profit generation and vice versa.

Recommendations

Based on the specific findings of this study, we recommend as follows:

1. Since, human capital efficiency (HCE) has been shown to be the key driver of value creation especially in return on assets (ROA), efforts should be made to grow intellectual capital of firms by first recruiting very competent staff, train and motivate them.

2. Firms should invest in education and relevant programmes that can help increase in their structural capital by harnessing information technology.

3. Companies must strategically train and retain staff for a long time to avoid losing the intellectual assets possessed by them which could simulate better return on assets.

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Appendix
Table 1: Descriptive Statistics

	HCE	SCE	CEE	ROA
Mean	0.847623	-0.639783	82.53373	0.030018
Median	0.947300	0.536450	0.104750	0.038550
Maximum	4.310100	20.23200	3296.370	0.158100
Minimum	-9.877400	-27.73720	-0.295500	-0.303800
Std. Dev.	2.519456	6.204015	521.1816	0.076942
Skewness	-1.955824	-1.564564	6.084868	-2.000507
Kurtosis	9.395330	13.89217	38.02563	10.12356
Jarque-Bera	93.66872	214.0512	2291.495	111.2553
Probability	0.000000	0.000000	0.000000	0.000000
Sum	33.90490	-25.59130	3301.349	1.200700
Sum Sq. Dev.	247.5587	1501.102	10593582	0.230881

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| Observations | 40 | 40 | 40 | 40 |

Source: Authors' E-view 9.0 Output

Table 2: Regression Analysis

Dependent Variable: ROA
Method: Panel Least Squares
Date: 07/01/22   Time: 15:38
Sample: 2010 2019
Periods included: 10
Cross-sections included: 4
Total panel (balanced) observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HCE	0.028221	0.004299	6.565190	0.0000
SCE	-0.001035	0.001087	-0.952184	0.3505
CEE	-9.78E-06	1.72E-05	-0.567501	0.5756
C	0.006242	0.007329	0.851747	0.4028

Effects Specification				

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.873410	Mean dependent var	0.030018
Adjusted R-squared	0.794291	S.D. dependent var	0.076942
S.E. of regression	0.034897	Akaike info criterion	-3.583657
Sum squared resid	0.029227	Schwarz criterion	-2.908106
Log likelihood	87.67315	Hannan-Quinn criter.	-3.339399
F-statistic	11.03923	Durbin-Watson stat	1.114644
Prob(F-statistic)	0.000000		

Source: Authors' E-view 9.0 Output

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