Effect of Human Capital Efficiency on Listed Non-Financial Firm Value in Nigeria; Moderating Role of Board Members Continuous Education

Musa Shaba[1] , Dr. Isah Shitu[2] , Dr. Usman Baba Aliyu[3] , Prof. Hassan Ibrahim[4]

[1]Department of Accounting Faculty of Management and Social Sciences School of Post Graduate Studies Ibrahim Badamasi Babangida University, Lapai Niger State, Nigeria

[2]Department of Accounting Faculty of Administration Ahmadu Bello University, Zarai, Nigeria

[3,4]Department of Accounting Ibrahim Badamasi Babangida Univeristy Lapia, Nigeria

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ABSTRACT

The study examines the effect of human capital efficiency moderated by Board members customers on value of non-financial firms in Nigeria quoted in the Nigeria Exchange Group for the period of 2020 to 2024. A total of eighty-six (86) firms were used after meeting up with the filtering criteria used for the study. Longitudinal research design was employed for the study. The study employs secondary data extracted from the Annual Reports and Accounts of the sampled companies. Diagnostic tests were carried out on the statistical procedure used in evaluating the validity and reliability of the analysis. Data were analyzed using Generalized Method of Moments; test for multicollinearity conducted using Variance Inflation Factors and heteroskedasticity test was conducted to ensure the validity and reliability of the research finding and ensure reliable and efficient estimates of the correlation coefficient. While the hypotheses were tested using regression model, the results shows that human capital efficiency moderated by board members continuous education does not positively and significantly moderate the effect of human capital efficiency of non- financial firms for the period under review. The study recommends that non- financial firms should engage in strong human capital investment by encouraging every staff to improve in their capacity either collectively or as individual. Managers of Nigerian non- financial firms should ensure capital development by linking training budgets to value creation metrics and embedding HCE in executive performance appriuisal.

Keywords: Human Capital, Human capital efficiency, Board members continuous education and firm value.

INTRODUCTION

Company always strives to maintain and enhance its value as an indication of management efficiency. One of the steps that can be taken by a company in order to maximize its value is by owning intellectual capital, disclosing intellectual capital, and reporting good corporate financial performance (Bontis, 2003). The value of a company is the market value of its debt and equity securities outstanding in companies and the investors perception of the level of success of the company that are often associated with stock prices (Keawn, 2004).

Serving as members of boards, directors bring human capital to their companies. Costa and Camuffo (2014) posits that directors provide the companies with their human capital in the form of education or their prior work experience. Human capital improves directors' ability to determine and take advantage of business opportunities (Palo, 2015). Keasey and Hudson (2002) and Becker and Poredo (2004) agreed that independent and non-executive directors need a good understanding of accounting practices since most of their functions revolves around financial reporting. Good corporate governance extends beyond balance composition of independent directors, board experience, skills and knowledge are as well vital to the successful delivery of board charter. (Gul & Leung, 2004).

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One of the main objectives of a company management is to maximize company value. Firm value is at the centre of corporate finance. However, calculating a value for a company is not easy. The last two decades have seen a stream of innovation in financial markets, yet corporate valuation methods have not changed significantly (Subaidu & Mardiati, 2018). Traditional corporate valuation methods include discounted cash flow valuation, liquidation and accounting valuation, relative valuation and contingent claim valuation (different authors proposed various groupings of valuation methods). The bulk of these methods reflect historical performance. Traditional corporate valuation methods are based on statement of financial position, income statement or cash flow statement; however, intellectual capital is an asset as well. Yet it is valued at zero on the Statement of financial Position. Large differences exist between company market and book value and a part of this can be explained by intellectual capital. Even though there is no universal definition of intellectual capital efficiency. Berzkaine & Zelgalve (2013) defined intellectual capital efficiency as the sum of human capital efficiency, structural capital efficiency and capital employed efficiency which measures the productivity of a firms knowledge based resources in generating value added. its information provides an indication about the future potentials of a company. While it is necessary to also take into consideration the value which is off Statement of Financial Position and possible growth

To achieve maximum firm value, a good financial performance is needed to increase the firm's value. Ozer and Cam (2022) opined that intellectual capital has become an important value determinant in today's companies because it is a unique resource of firms that contributes to value creation and sustainable competitive advantages, therefore, intellectual capital can be regarded to be value-relevant to market participants because it is thought to affect decisions of related information users. Luthy (2023) states that virtually every sector of the economy has felt the impact of increased intellectual capital. For instance, in the steel industry the labour cost per ton of steel has been reduced significantly. In the airline industry reservation systems have become a major source of revenue. In manufacturing, product design is handled on computers without the need for drawings or mark ups. It has virtually affected all business. In addition, intellectual capital efficiency has contributed to the creation of whole new types of business and ways of doing business. In fact, many companies rely almost completely on intellectual assets for generating revenues. For example, the software industry is primary knowledge based.

While prior studies such as Botinz (2003), Keawan (2004), Gul & Leung (2004) and ozer & cam (2022) established their human capital efficiency positively influence market value and financial performance. Most evidence comes from developed economics. In Nigeria studies in this area remain sparse, the few Nigeria studies in intellectual capital. E.g Ofar & Okoye (2022) focused on manufacturing firms but did not isolate Human Capital efficiency or test it's direct effect on market based measures like Tobins Q or market to Book

Hence, there is a contextual gap, the human capital efficiency company value relationships is under researched in Nigeria

In the post International Financial Reporting Standard (IFRS) and corporate governance practice code of 2018 that brings about changes in the system and operations of accounting practice in Nigeria. There is a gap as to the effect of intellectual capital efficiency and board continues education on company's value.

LITERATURE REVIEW

Conceptual Review

Firm's value

Firms/Companies, whether they are private, public or NGOS have a set of values, whether or not they are written down. Even if companies do not explicitly spell out their value, they still use them to guide their actions.(Lestan & Suryan, 2020). One of the goals of any company is to create value by providing returns for the shareholders of the company and maximize the shareholders' value which results from sustainable financial performance. (Raimi & Garba, 2023)

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The value of firms is very important because higher company's value is in line with higher prosperity of shareholders (Brigham, 2006). The higher stock prices result in higher company's value also. The desire of shareholders is increasing company's value because the increasing of company's value shows higher shareholders prosperity. The wealth of shareholders and company is presented by stock price as a reflection of investment decision, finance and assets management are cardinal objective of the company is maximizing the company's value. The high company's value is represented by prosperity level of owners. The company's value also becomes the main focus of the investors. The prosperity level of shareholders and investors can be seen from the company's value itself. It means that the company's value becomes the performance indicator of finance manager in company. From the investors perceptive, the company's value usually related with stock price meaning that higher stock price will make higher company's value also. The main goal of the company is maximizing the assets or company's value. Increasing the prosperity of shareholders which is in line with increasing the company's value is becoming the main goal of company. (Berzkalne & Zelgalve 2014).

The suitable measurement used for measuring company's value is market value ratio, because it describes a comparison between risk and return. There is a relationship between valuation and the purpose of a company (maximizing the company's value and shareholders wealth). Valuation or market value ratio consists of Price Earnings Ratio (PER), Price/ Cash Flow Ratio, and Price to Book Value Ratio (PBV).

Rosikah, Pranamingrum, Muthalib, Azis and Rohansyah (2018) assert that higher ROA value indicated better firms' financial performance (profitability), because of a higher return on investment rate serves to lure investors thereby raising the price of the shares. Return on asset is used to measure the company capability to create profit using assets owned by a company in the future, higher ROA of a company performance will lead to a more effective company. It can therefore, be seen as a positive sign for any investors to invest in the stock of the company, a decision that will lead to increasing the company's stock price in the capital market.

The company's value can also be seen in the company's ability to grow and develop, one of the growth of the company's assets, Fahmi (2014) stated that the growth ratio in the ratio that measures how much a company's ability to maintain its position in the industry and the general economic development. One model of financial analysis used to assess the performance of the company in the ratio of Tobin's Q. this ratio is used to determine the performance of the company through the potential development of the stock price, the potential ability of managers to manage the assets of the companies and potential investment growth. Investors need information on Tobin's Q. to determine whether the company is in growing conditions; not growing or even declining so that they can decide what to do in these conditions (Sudiyano & Puspitasari, 2010).

Anifowose etal (2018) assert that most of the previous studies have been limited mainly to impact of intellectual capital performance on traditional accounting performance indicators such as ROA, Return On Equity (ROE) and Tobin's Q. which are inadequate in explaining Firm value due to their static nature of measurement that are mostly based on tangibility concept corporate assets, vagueness of definition and subject to management manipulations using accounting standards and frameworks. Thus, after decades of utilizing such measures, many businesses today have traded them in for new value-oriented measure of success such as stern and Stewart's Economic Value Added (EVA) and the Boston consulting group's value added (CVA) concepts. (strack & villis, 2002). EVA has recently become a veritable tool for financial decision-making among investors (Worthington & west, 2004) and can be considered as the best objective periodic corporate performance evaluation compared to misleading accounting performance measures (Steward, 1991).

Iranmahd, Moeinaddin, Shahmoradi, and Heyrani (2014) in their study used Value Added Intellectual Coefficient (VAIC) as a measurement tool for IC and market value as a measure of company value. However in this study Intellectual capital efficiency will be proxies by Human capital efficiency (HCE), Organizational capital efficiency (OCE) and Customer capital efficiency (CCE.) They stated that there was no relationship between IC and company value. On the contrary, martins and lopes (2016) and Berzkalne and Zelgulre (2014) used Tobin's Q. as a measure of company value. They revealed that an increase in IC could increase company value. They stated that IC was the critical point to increase company value. Based on those contrary research results and the differences in theory and facts it is considered necessary to conduct further research on the effects of intellectual capital efficiency on Firm value using the board members continuous education on a moderating variable.

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Price earnings ratio is the ratio of price per share to earnings per share. This ratio shows how much the naira must be paid by investors to pay every naira reported profit. Price/ cash flow ratio is the price per share divided by cash flow per share. While Price to book value ratio is a ratio that shows the relationship between the market price of a company's stock and the book value of the company. There are several benefits of using Price to Book Value Ratio; first, it can be compared to the market price because PBC is relative stable. Second, it can be compared between similar companies for identifying under -or over valuation, and third, it may evaluate the negative earnings of a company. It can be concluded that company's value 1s the investor's perception towards the level of company that is related to stock price. One levy measurement to determine the company's value is using Price to Book Value Ratio (PBV). The PBV rate reflects the level of sustainability of the company in the investors. The main goal of the company according to the theory of the firm is to maximize the wealth of value of the company, (Aldino, 2015).

In addition in the contemporary theory in finance, value maximization has been given adequate concern compared to traditional profit maximization concept of classical school of thought in determining corporate value, both in financing and investing decision making among various stakeholders (lipez-iturrriage & rodrignez-sanz, 2001). Hence, corporate valuation is a relevant exercise to both entities as legal persons and various stakeholders, particularly the investors. Thus corporate value could be seen both from corporate book and corporate market value (Koller 2010). While the former in value placed on corporate entity by capital market participants, the latter is value placed on company based on its fundamentals. Meanwhile, most available literature is mostly on intellectual capital disclosure on corporate market value. Since intellectual capital efficiency is concern with how the entity utilizes its intangible potential, the appropriate measures of performance should be combination of both accounting and market measures. Hence, measure such as return on assets, Tobin's Q and economic value added would be considered appropriate, due to the intangible nature of intellectual capital.

Human Capital

Human capital have to do with human ability, capability knowledge and wisdom use in an organization. Human capital affects the extent to which the objective of the organization can be achieved.

According to Becker (1964) human capital refers to knowledge, skills, attitudes and other acquired traits that enhance the productive capacity of individuals accumulated through education. Human capital have to do with human ability, capabilities knowledge and wisdom use in an organization. Human capital affects the extent to which the objective of the organization can be achieved.(Becker, 1994). Human capital is defined as a collection of knowledge, creativity and features with which individuals utilize in carrying out their jobs effectively (Weatherly, 2003).

Human capital is created by employees by their inherent and acquired knowledge, skills, talents, and competencies. In this way, HC can be considered as a dynamic index and a very important factor for the prosperity of the organization today. On the other hand, HC refers to the knowledge (explicit or tacit and individual or social) that people and groups possess and their abilities to generate it, which is useful for the strategic purpose (mission and vision) of the organization. Ultimately, human capital is integrated by what people and groups know and learn and how they share that knowledge with others in such a way that benefits the organization. Within human capital appropriate to the characteristics of each organization, elements such as values and attitudes, aptitudes (knowing), and capacities (knowing how to do) can be considered, according to Bueno et al., (2011)

From Bontis, (1999), perspective HC is a production factor in the organization and is a combination of intelligence, knowledge, and skills, which provide each organization its special character. People are elements of the organization that are capable of learning, innovating, thinking creatively, initiating, and making changes. Simultaneously, it is a necessary assumption for successful long-term performance in the market because it acts as a source of innovation and strategic renewal in organizations.

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Nayab & Roohi (2023) defined human capital as the knowledge, skills and abilities that individuals possess, which are acquired through education, training and experience it encompasses both general skills (such as literacy and numeracy) and specific skills (such as technical expertise in a particular field).

From the discussions Human capital efficiency can be seen as an intangible asset that individuals invest in to enhance their future productivity and earnings potential. It includes skills, abilities, expertise and knowledge of workers which can be impacted on others and possess that the ability to enhance organization profitability and value.

Human Capital efficiency

Human capital efficiency is a component of the value added intellectual co efficient. It measures how much value added is created by each monetary unit invested in human capital (pulic 1998)

Chen, Cheng & Hwang (2005) Human capital efficiency reflects the ability of human capital to create value for the frim. It's calculated as value added divided by human capital, where human capital is represented by total employee expenditure

Tan, Plawman & Hancock (2007) Defined Human capital efficiency as the ratio of value added to human capital. It captures the contributions made by every dollar invested in human resources towards value creation

Clarke, Seng & whiting (2011) quantifies human capital efficiency as the effectiveness of a firms investment in its employees. It's computed as value added scaled by human capital with human capital prozied by the total staff costs.

Nadeem, Gen & Nguyen (2017), defined Human capital efficiency as the ratio of a firms value added in its human capital. In the VAIC framework, human capital is measured by total employee expenses and human capital efficiency. Therefore indicate the value creating capability of the firms workforce

Smirth & Das (2018) refer to Human capital efficiency as the value added generated per unit of money spent on employees. It's the most critical component of intellectual capital because employees are the primary source of innovation and customers instruction

Human capital efficiency is defined in the VAIC framework as the ratio of value added to human capital where human capital is measured by the employee costs including salaries, wages and other benefits. It geantified the productivity of firms workforce by indicating how much new value is created for every monetary unit invested in employees

Board members Continuous Education

Certo, (2003) describes that directors provide the companies with their human capital in the form of education or their prior work experience. The human capital improves director's ability to determine and take advantage of business opportunities. Empirical evidence on the relationship between human capital and performance in various industry, country, age of the business, the magnitude and the strength of the relationship depend on the conceptualization of human capital, the choice of performance indicators, the data and the analysis methods used (Crook, Todd, Combs, Soehr & Ketchen, 2011).

Khanna, (2014), argue that the benefits of board's human capital also depend on the information processing loads by the members. Recent research also looks at different proxies for board human capital, for example, beside using education, experience or tenure to capture human capital of directors, Francis, Hussan & WU (2015) also used professorship at universities as an additional proxy for board human capital. Their research points out that the presence of academic professors in board is associated with greater acquisition performance and higher value, higher stock priced informativeness.

One of the issues that has become of interest to researchers is the effect of board of directors' continuous education on the company's value Papadimitri, Pasiouras & Ventouri (2020), stressed that every appointed

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board member must have specific criteria such as skill, knowledge, expertise, experience, professionalism and integrity.

From the foregoing, it can be stressed that board of directors' continuous education is key to determine and take advantage of business opportunities. It is germane for decision making that can influence company's performance both in the short run and long run and subsequently its value.

Empirical review

Ozer and Cam (2022) investigate whether intellectual capital and its components (human, relational, innovation and process capital) have meaningful information on firm value. Sample of 148 listed Turkish manufacturing firms over the period of 2005 to 2017 using chison models to explain the substantial part of unexplained variation in firm market value. The result shows that higher levels of measures of human capital, relational capital, processes capital, innovation capital and overall intellectual capital are directly associated with higher stock prices. The value added intellectual capital model should have been better, the study also limits is the manufacturing companies.

Yawe, Oyinaka, Aliyu and Bello (2023) examined the effect of intellectual capital on financial performance of listed agricultural firms in Nigeria. The study concentrated on the period from 2011-2020. 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 sample size for the study is non-adequate for detail analysis.

Ebe, Salawu and Aguguom (2023) examined the effect of International Accounting Standards (IAS) 38 intangible assets on the firm performance of selected consumer manufacturing companies listed in Nigeria. The study employed secondary data extracted from the published financial statements of the sampled 15 companies out of a population consisting of 20 selected consumer goods manufacturing companies listed in Nigeria using a purposive sampling technique. A firm observation of 220 participants over 11 years from 2011-2021 was used in the study. Descriptive statistics and inferential analysis were adopted in the data analysis. The study revealed that intangible assets had a positive and significant effect on earnings per share (EPS) and the return on shareholders' funds (SHF). The study concluded that the firm performance of selected consumer goods manufacturing companies in Nigeria was significantly affected by IAS 38 intangible assets. The study was conducted using only 15 forms which make it small for detail analysis.

Otuya, Akpoyibo and Edike (2023) investigated intellectual capital efficiency as a source of creating shareholders' wealth in Nigeria. Correlational research design was adopted. The study's data were collected from content analysis of financial statements of listed service companies in Nigeria. The sample used in this study includes 17 service firms listed on the Nigeria Exchange Group from 2011-2022. The VAIC model was utilized to estimate intellectual capital. The random effect regression model was used to verify whether the studied variables impact shareholders' wealth of listed service companies in Nigeria. Findings indicated that value added intellectual coefficient as a measure of intellectual capital has a significant positive association with shareholders' wealth. The sample size for the study using only 17 service firms is small.

Umar and Dandago (2023) in their study investigated the relationship between intellectual capital and financial performance of 58 listed non-financial service firms in Nigeria for a period of eleven years from 2012-2022. The study extracts data from annual reports and accounts of the listed non-financial service firms in Nigeria. The intellectual capital (human and structural and relational capital) of selected firms has been analyzed and their impact on financial performance has been measured using the multiple regression technique. The findings of the analysis reveal that the relationships between intellectual capital and financial performance indicators, namely ROE and TQ, are varied. The study results suggest that intellectual capital influences the financial performance of Nigeria's listed non-financial service firms. The study uses TQ in measuring performance TQ are only better use for, measuring value and non-financial performance.

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Ajibade and Lawal (2022) conducted a study on the effect of intangible assets on the financial performance of manufacturing firms in Nigeria. They analyzed data from 15 manufacturing firms over a 6-year period, from 2014 to 2019, using both descriptive and inferential statistics. The regression analysis highlighted a positive and statistically significant relationship between intangible assets (such as patents and trademarks) and return on investment (ROI), suggesting that effective management of intangible assets enhances overall financial performance. The study firm size and period was small for better analysis.

Innocent, Nwannebuike and Effiong (2022) examined the empirical review of intangible assets on financial performance of Listed Oil and Gas Sector in Nigeria. The independent variable intangible assets was proxied by log of intangible assets (LITA) while dependent variable financial performance proxied by return on assets (ROA), return on equity (ROE) and return on capital employed (ROCE). The ex-post facto research design which made use of secondary data drawn from the annual report and accounts of four (4) companies in listed oil and gas sector in Nigerian economy covering a period of ten (10) years from 2009 to 2018 both years inclusive. Panel ordinary least square (OLS) for the study was applied. The result of the regression analysis revealed that intangible assets (LITA) have positive and insignificant effect on return on assets (ROA), return on equity (ROE) and return on capital employed (ROCE) of listed oil and gas sector in Nigeria. The study uses (2009-2018) in 2020 make the study not current.

Businesses have to possess a number of skills and competencies (such as: management of intangibles, knowledge, innovation and intellectual property etc.) which were not seen in the traditional economy and shaped the basis of the knowledge and innovation to survive and achieve competitive advantage (Al-Ali, 2003). As organization were specialized in the management of the competencies and skills, they have begun to promise more future growth opportunities (Chang et al, 2007), and as a result of this process, financial statements remained insufficient to measure these growth opportunities and substantial's differences between the book value and market value of a company has become apparent, especially in the last thirty years period (Pena,, 2002), in a research conducted by Lev(2002) on united states standard and poor's 500 companies from 1997 to 2001. It has been demonstrated that more than 80% of the market value of a company was not included in the financial statements (Wang, 2008). This study was conducted before 2018 and with the existence of corporate governance code makes the study to be less reward today.

Sisodio, Jadiyapa and Joseph (2021) in the study investigate the effects of human capital on firm value. Using Tobin's Q to proxy for firm value, human capital ratio and the ratio of total employee compensation to firm's sales, size on the log of firm sales, firm growth in annual sales growth rate, return on assets and earnings before income tax by total assets and leverage in total dept to assets. The result shows positive relationship between human capital and firm value. The study uses Tobin's Q to proxy for firm value which in a market-based approach, intellectual capital efficiency as to do with value addition.

Nnubia, Okolo and Nwokeji (2019) investigate the effect of intellectual capital on performance of non-financial firms in Nigeria using 21 Nigeria non-financial firms listed on Nigeria stock exchange, the study adopted ex-post factor research design, the data was analyzed using ordinary least squire method, the result shows that for the Nigerian listed non-financial firms, the explanatory variables-capital employed efficiency, human capital efficiency and structural capital efficiency has positive significant effect on the dependent variables-Earnings Per Share and Market to Book Value (performance). The study recommends that organization can achieve sustainable value with investments on intellectual capital. This study employed the use of least square method in analyzing the data will not provide much needed result and did not put in to consideration the level of education gratification.

Considering the individual variables for intellectual capital, Hidayat and Latief (2018), I focused on the influence of human capital management development toward the company performance. Using four developer companies in south Sulawesi Indonesia. Employing descriptive analytical method and quantitative analysis approach, the study uses smart PLS version 2.0m data analyzing method. The study reveals positive relationship between human capital and company performance. The sample size is small due to the nature of the study. While Battisti and Stoneman (2010) conducted a study that investigated the impact of training and innovation on firm productivity and market value, using data from UK manufacturing firms, they found that both training and innovation had positive effects on firm productivity. Moreover, they found that the positive

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effect of training on productivity translated into higher market value, indicating the link between human capital investment, productivity, and firm value. The study was limited to manufacturing firms of which the effect of intellectual capital efficiency may be less compare to service firms and secondly in a developed economy.

On the other hand, Cappelli and Neumark (2001) conducted a study that examined the impact of workforce skills on firm productivity and market value. Using data from a national sample of establishments in the United States, they found that firms with higher-skilled workforces had higher levels of productivity and profitability. The study indicated that human capital plays a crucial role in enhancing firm value through improved productivity. The study limits its scope to human capital and do not look at other component of intellectual capital. This study was supported by Huselid (1995) who conducted a study that examined the relationship between human capital and firm performance in a sample of 968 firms. He measured human capital by considering the education, experience, and tenure of the workforce. The study found a positive and significant association between human capital and various performance measures, including return on assets and market value. The findings suggested that investments in human capital positively impact firm value. The study limits itself to manufacturing firms. Others sectors are equally of importance in area of study also special of information communication technology.

THEORETICAL FRAMEWORK

The theory that underpins this study is Human Capital theory

This theory attempts to answer the question on "why the decision to invest in education is made". The theory is therefore relevant at the decision-making stage. The proponents of this theory (Theodore Schultz, 1998; GaryBecker, 1967) see human capital as how education increases the productivity and efficiency of workers by increasing the level of their cognitive skills. In other words, they see human capital as the stock of economically productive human capabilities, which can be formed by combining innate abilities with investments in humans' beings. Examples of such investments includes; expenditures on education, on-the-job training, health and nutrition. Such expenditures increase future productive capacity at the expense of current consumption. The provision of education is seen as a productive investment in human capital, an investment which the proponents of the human capital theory consider to be equally worthwhile than that in physical capital. The motion of education as a capital good is rooted in this concept of human capital, which attached a high premium to human skills as a factor of production in the development process.

Babalola (2003) identified the rationality behind investment in human capital based on three arguments, which implies that the new generation must be given appropriate parts of the knowledge which has already been accumulated by previous generations; that the new generation should be thought how existing knowledge should be used to develop new products in order to introduce new processes, procedures and production methods.

In a knowledge economy, tertiary education can help economies keep up or catch up with more technologically advanced societies. Higher education graduates are likely to be more aware of and in a better position to use new technologies; they are also more likely to develop new tools and skills themselves. The knowledge and skills acquired by the employers and board members will increase their confidence and technical know-how. This theory is important for this study because of its objective one.

This theory is important to this study as firm's value are enhanced if the staff are well educated and experienced in their various field it will bring about efficiency which will lead to increase productivity there will be more revenue at the end the shareholder will enjoy high dividend, firm's that paid high dividends are of value because people will be interested in investing in such firm. This then justifies inclusion of Human Capital Efficiency Variable in the study.

METHODOLOGY

The study used longitudinal research design because of the nature of the specific objectives, the population, the nature of the data and the test statistics adopted. This design was used because of the panel nature of the data

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(time series and cross-sectional data). This study involve the measurements of the proxies of the independent variable against the dependent variable. longitudinal research design is more appropriate for this study because it allow for predicting the effect of explanatory (independent) variables on the dependent variable.

The Population of the study comprise of 112 non-financial companies quoted on the Nigerian exchange group as at 31st December, 2024, the 112 non-financial companies cover the following sectors; Agriculture, Conglomerate, Consumer Goods, Industrial Goods Healthcare, Technology, Real Estate and Construction, Oil and Gas, Services Sectors and Natural.

The study adopted three filters to eliminate companies considered not suitable from the population to make the sample for the study. These filters are as follows:

1. The companies must remain listed throughout the period of study.
2. The company should not have been nationalized by the government through her agencies and
3. Companies that provided, adequate data regarding the variable of interest of the study.

As a result of above filters, twenty-six companies representing 23% did not make the sample for the study while 86(77%) of the population makes the sample for the study.

The study employed secondary source. The study used documentary firm-level data that was extracted from the Annual Reports and Accounts of the sampled firms and the Nigerian Exchange Group website. Data for the estimation of the model was extracted from the sampled firms' Annual Reports and Accounts while the date of firm's quotation and date of firm incorporation was extracted from the NEG/fact book and website. The data were from (2020-2024) using annual financial statements of the firms which was downloaded from the website of the companies. Meaning total of six hundred and two firm year's observations was the basis for sampling

Variable measurement

In this study, Human capital efficiency(HCE) is the independent variable, the company value which is the dependent variable variable proxy by Tobin's Q as done in the study by Ante public (2000, 2005) Firer and Williams (2003), Joshi et al (2013) Zeghal and Maraloul (2010) and Anifowose et al. (2018), Ekaputra (2020) and Hertina (2020).

Firm Leverage (LEV), Firm Liquidity (Liq) and Firm size (Fsize) were introduced as control variables to improve on the regression result. The variables measurement is presented as follows:

Human Capital Efficiency:

Human Capital Efficiency is the contribution made by every unit of money invested in human capital to the value added. The human capital in the expenses related to the employee compensation and development. HCE = VA/HC.

This measurement is consistent with: Lestari (2020), Anifowose (2018) and Ulum (2008).

Data analysis

Descriptive Statistics

Descriptive statistics was estimated for the variables; Value of firm (Tobin-q), Human capital Efficiency (HCEit), firm leverage (LEV)

Table 1. Descriptive Statistics

Statistics	TOBIN Q	HCE	BCE	LEV	LIQ	FMZ
Mean	12.0808	50.0039	5.4074	6.4445	1.9539	7.3428

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Standard Deviation	23.5322	369.1907	1.8871	0.9757	7.2056	0.9797
Kurtosis	32.7312	189.1947	-0.2237	1.4243	231.7190	1.6788
Skewness	5.0775	12.9807	-0.6885	-0.6888	14.5079	-0.5508
Range	260.5201	6472.8900	8.8596	5.6521	121.7632	7.3948
Minimum	0.0002	0.1179	0.0716	3.1864	0.0013	2.0755
Maximum	260.5203	6473.0078	8.9312	8.8385	121.7644	9.4704
Count	600	598	602	600	600	596

Source: Author's computation

Table 1 shows the descriptive statistics for the variables value of listed non-financial firms (TOBIN-Q), Human capital efficiency (HCE), with mean values of 12.0808, 50.0039, 5.4074, 6.4445, 1.9539 and 7.3428. The standard deviation values are 23.5322, 369.1907, 0.4431, 910.0883, 1.8871, 0.9757, 7.2056, and 0.9797, in which most of them are smaller to their mean values respectively.

The implication of this result is that the market value of the firms is higher than their replacement cost of assets, indicating that the firms are overvalued or have strong growth prospects. In the case of human capital efficiency, value created per unit of human capital investment is very high, indicating that firms spend so much in training their staff for efficient performance.

The average board members continuous education of 5.4 is an indication that education of board member is low compared to human capital efficiency. This signifies that firms train staff for the purpose of their job function and not train staff through school.

The average firm leverage of 6.4, i.e. debt-to-equity ratio indicated moderate-high leverage, the firm liquidity (LIQ), revealed a decent liquidity and firm size of 7.34 indicated that the firms are relatively large firms. The kurtosis values for TOBIN-Q, HCE, BCE, LEV and LIQ are 32.7312, 189.1947, and 231.7190 which are greater than 3 indicated that the dataset for the variables is leptokurtic. While BCE, LEV and FMZ are less than 3, which indicated that they are platykurtic. The skewness values for TOBIN-Q, HCE, BCE, LEV and LIQ are all positively skewed with value of 5.0775, and 12.9807, But BCE, LEV and FMZ are negatively skewed.

Correlation Analysis

Table 2: Correlation Matrix

	TOBIN Q	HCE	OCE	LEV	LIQ	FMZ
TOBIN Q	1					
HCE	-0.0448	1				
BCE	-0.0451	0.0315	-0.1018			
LEV	0.0050	-0.0654	0.0359	1		
LIQ	-0.0567	-0.0073	-0.0349	-0.1221	1	
FMZ	0.0462	0.1460	-0.0620	0.4986	-0.0454	1

Source: Author's computation

Table 2 shows result of the matrix correlation for value of listed non-financial firms (TOBIN-Q), The result revealed that Human capital efficiency (HCE), moderated by Board members continuous education (BCE), and Firm Liquidity (LIQ) the control variable, correlate to firm value negatively, by -4.48%, -4.51%, and -5.67%. While Firm Leverage (LEV) and Firm Size (FMZ) correlate to value of firms by 0.5% and 4.62%. They all show a weak correlation.

The cross sectional dependence results shows that the pesaran CD is 1.77 and the p- value 0.24805. the null hypothesis (no cross sectional dependency) was not rejected predicting the absence of cross sectional dependency for all the variable a cross firms at 5% level of significance. The p value of 0.24805 and greater

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than 0.05. the implication is that each series contains cross sectional independence suggesting that a stock occurring in one of the firms may not effect or cannot be transmitted to other firms.

Model Estimation

Estimation of Model

Table 3 Choice of System-GMM and Difference-GMM

Variable	Pooled	Fixed Effect	Diff-GMM
Tobin-$q_{i,t-1}$	0.529073**	0.311322**	0.1401972
$HCE_{i,t}$	-0.0026896	-0.00407	-0.002042
$LEV_{i,t}$	-0.4131331	-0.0373068	-0.0394934
$LIQ_{i,t}$	-0.1194299	0.0057762	0.0471697
$FMZ_{i,t}$	8.31384**	8.31384**	10.38763**
Constant	1.932806	-52.77072	-66.09178**
N	502	502	410
R^2	0.2896	0.1593	-
F-stat	41.85**	15.65**	17.55**

Source: Authors Computation

Table 3 shows the summary of results for the pooled regression, fixed effect and Difference-GMM. The estimated results are robust because they corrected for heteroscedasticity and auto-correlation problems. According to Bond (2001), to choose between System-GMM and Difference-GMM, there is need to estimate the models with the dependent variable lag to obtain the coefficient by Pooled regression, Fixed effects and Diff-GMM methods. If the estimated coefficient of the dependent variable of Diff-GMM is close to the Pooled regression method, then the Diff-GMM is a better estimator than the sys-GMM. But if the coefficient of fixed estimation of the lag dependent variable is close to the pooled method, then the SYS-GMM is a better estimator. From the result, the coefficient of Fixed effects 0.311322 is closer to the coefficient of Pooled regression of 0.529073 than the coefficient of Diff-GMM of 0.1401972. Thus, the Sys-GMM was found to be a better estimator than the difference-GMM.

Estimation of Sys-GMM

Table 4 Result of System-GMM

System-GMM Results Table

Variable	System-GMM Coefficient	P-value
Tobin-$q_{i,t-1}$	0.354002	0.000**
$HCE_{i,t}$	-0.002323	0.293
$LEV_{i,t}$	-1.960337	0.543
$LIQ_{i,t}$	0.02493	0.705
$FMZ_{i,t}$	11.51661	0.016
Constant	-64.52536	0.055
N	502	
R^2	-	
F-stat	44.28	0.000**
AR(1)	-2.5818	0.0098
AR(2)	1.5796	0.1142
Sargan Test	3.687	0.9457

Source: Author's computation; Dependent Variable: **Tobin-$q_{i,t}$**

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Note: ** show significance at 5%

Table 4, shows the estimated coefficients for Arellano and Bover/ Blundell and Bond (Sys-GMM). The value of the AR (1) for SYS-GMM indicated that there is presence of serial correlation between the lagged dependent variable. However, the AR(2) for Sys-GMM revealed the absence of correlation. Thus, signifying the validity of Sys-GMM. The Sargan Test confirmed the adequacy of the sys-GMM. It showed that the null hypothesis which is over-identifying restrictions are valid is upheld.

The lagged effect of Tobin-qit-1 on the current Tobin-q is positive and significant at 5% level, for SYS-GMM. This means that the present value of Tobin-q dependent on the effect of the past value, indicating that what happens in the current year was predicted by what happened the previous years.

The effect of human capital efficiency (HCE) on Tobin-q is negative and insignificant at 5% level, for SYS-GMM result. This means that the human capital efficiency (HCE) showed a detrimental effect on firm value, indicating that human capital efficiency (HCE) is Human capital created by employees by their inherent and acquired knowledge, skills, talents, and competencies. People are elements of the organization that are capable of learning, innovating, thinking creatively, initiating, and making changes. Simultaneously, it is a necessary assumption for successful long-term performance in the market because it acts as a source of innovation and strategic renewal in organizations. But, most employees do not push for more knowledge but work according to scheduled duty, hence the negative influence to firm value due to monotony of work.

The coefficients of Firm Leverage (LEV), was found to negatively affect the value of firms, while Firm Liquidity (LIQ) and Firm Size (FMZ) were found to positively impact on value of firm. However, only firm size was found to significantly influence the value firms.

Table 5 Choice of System-GMM and Difference-GMM

Panel Regression Results Table

Variable	Pooled	Fixed Effect	Diff-GMM
Tobin-$q_{i,t-1}$	0.5275746**	0.3098189**	0.138013
$HCE_{i,t}$	-0.0385024	-0.057058	-0.0146167
$BCE_{i,t}$	-0.4728745	-2.637102	-2.320245
$HCE*BCE_{i,t}$	0.0052701	0.0079326	0.0019758
$LEV_{i,t}$	-0.3936446	0.3997019	0.1554108
$LIQ_{i,t}$	-0.1318963	0.015228	0.0506741
$FMZ_{i,t}$	0.9208895	8.071782	10.4846
Constant	4.071301	-39.38469**	-55.47089
N	501	501	408
R^2	0.2982	0.1541	-
F-stat	29.93**	11.58**	20.41**

Source: Author's computation; Dependent Variable: **Tobin-q** $_{i,\,t}$

Note: ** show significance at 5%

The insertion by Bond (2001), on choosing between System-GMM and Difference-GMM, there is need to estimate the models with the dependent variable lag to obtain the coefficient by Pooled regression, Fixed effects and Diff-GMM methods. If the estimated coefficient of the dependent variable of Diff-GMM is close to the Pooled regression method, then the Diff-GMM is a better estimator than the sys-GMM. But if the Diff-GMM is close to the Fixed effect method, then the SYS-GMM is a better estimator. From the result in Table 5, the coefficient of Fixed effects 0.3098189 is closer to the coefficient of Pooled regression of 0.5275746 than the coefficient of Diff-GMM of 0.138013. Thus, the Sys-GMM was found to be a better estimator than the difference-GMM.

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Table 6 Result of System-GMM

System-GMM Results Table

Variable	System-GMM Coefficient	P-value
$Tobin\text{-}q_{i,t-1}$	0.3521704	0.000**
$HCE_{i,t}$	-0.0260226	0.458
$BCE_{i,t}$	-4.389517	0.118
$HCE*BCE_{i,t}$	0.0037102	0.730
$LEV_{i,t}$	-1.469137	0.645
$LIQ_{i,t}$	0.0315122	0.623
$FMZ_{i,t}$	11.47739	0.015**
Constant	-43.58288	0.183
N	501	
R^2	-	
F-stat	49.25	0.000**
AR(1)	-2.5223	0.0117**
AR(2)	1.6658	0.0957
Sargan Test	2.457	0.5498

Source: Author's computation; Dependent Variable: **Tobin-q**$_{i,\,t}$

Note: ** show significance at 5%

Table 6, shows the estimated coefficients for Arellano and Bover/ Blundell and Bond (Sys-GMM). The value of the AR (1) for SYS-GMM indicated that there is presence of serial correlation between the lagged dependent variable. However, the AR(2) for Sys-GMM 1.6658 with p-value of 0.0957, which is greater than 0.05 revealed the absence of auto-correlation. Thus, signifying the validity of Sys-GMM. The Sargan Test of 2.457 with p-value of 0.5498 confirmed the adequacy of the sys-GMM. It showed that the null hypothesis which is over-identifying restrictions are valid is upheld.

The lagged effect of Tobin-qit-1 on the current Tobin-q is positive and significant at 5% level, with coefficient value of 0.3521704 for SYS-GMM. This means that the present value of Tobin-q dependent on the effect of the past value, indicating that what happens in the current year was predicted by what happened the previous years and that there is a 35.2% increase in Tobin-q in the current year as a result of 1% increase in Tobin-qit-1 of the previous year.

The effect of human capital efficiency (HCE) on Tobin-q is negative and insignificant at 5% level, for SYS-GMM result. This means that the human capital efficiency (HCE) has a negative effect on firm value, indicating that human capital efficiency (HCE) has not been adequately managed to enhance firm value under the study period in Nigeria.

The moderating variable, which is Board Members continuous education (BCE) was found to relate negatively to Tobin-q at 5% level of significance. This result means BCE reduced the value of firm but not at a significant level. The continuous learning of member without adding real values to the growth of the firms will eventually reduce the values of firms over time. Board member are expected to learning necessary skills that would bring additional value to the firms rather than develop them individually.

The interaction effect of human capital efficiency and board member continuous education ((HCE*BCE) on Tobin-q is positive but insignificant at 5% level. This means that the presence of academic professors in board is associated with greater acquisition performance and higher value, higher stock priced informativeness. However, the result of the interaction was found to be positive but statistically insignificant. This could that most firms under study do not have adequate or sufficient number of professors on board can could significantly add value with increased human capital development training.

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The coefficients of Firm Leverage (LEV), was found to negatively affect the value of firms, while Firm Liquidity (LIQ) and Firm Size (FMZ) were found to positively impact on value of firm. However, only firm size was found to significantly influence the value firms.

Test of Hypothesis

H01: Board members continuous education does not positively and significantly moderate the effect of human capital efficiency on value of listed non-financial firms in Nigeria.

Decision rule

If the p value is greater than the level of significance of 0.05, the null hypothesis is rejected while the alternate hypothesis is accepted. If the p value is greater than the significance level of 0.05, the null hypothesis is accepted and the alternate hypothesis is rejected.

The p-value for the interaction between board member continuous education and human capital efficiency is 0.730 from Table 1.7, which is greater than 0.05 level of significance. We fail to reject null hypothesis while the alternate hypothesis is rejected therefore, Board members continuous education does not positively and significantly moderate the effect of human capital efficiency on value of listed non-financial firms in Nigeria.

DISCUSSION OF RESULT

From the hypothesis, it was found that Human capital efficiency has no positive and significant effect on value of listed non-financial firms in Nigeria. This could mean that most firms' most employees do not push for more knowledge but work according to scheduled duty, hence the negative influence to firm value due to monotony of work. This result is contrary to the study of Sisodio, Jadiyapa and Joseph (2021) who investigated the effects of human capital on firm value. Using Tobin's Q to proxy for firm value, human capital ratio and the ratio of total employee compensation to firm's sales, size on the log of firm sales, firm growth in annual sales growth rate, return on assets and earnings before income tax by total assets and leverage in total dept to assets. The result shows positive relationship between human capital and firm value. The result is early contrary to Nnubia, Okolo and Nwokeji (2019) studied the effect of intellectual capital on performance of non-financial firms in Nigeria using 21 Nigeria non-financial firms listed on Nigeria stock exchange. The result showed that human capital efficiency and structural capital efficiency has positive significant effect on the dependent variables-Earnings Per Share and Market to Book Value (performance).

It does not agree with Hidayat and Latief (2018) who focused on the influence of human capital management development toward the company performance. The study reveals positive relationship between human capital and company performance. Battisti and Stoneman (2010) conducted a study that investigated the impact of training and innovation on firm productivity and market value, using data from UK manufacturing firms, they found that both training and innovation had positive effects on firm productivity. They found that the positive effect of training on productivity translated into higher market value, indicating the link between human capital investment, productivity, and firm value.

Findings contradicts Cappelli and Neumark (2001) who examined the impact of workforce skills on firm productivity and market value. They found that firms with higher-skilled workforces had higher levels of productivity and profitability. The study indicated that human capital plays a crucial role in enhancing firm value through improved productivity. The study limits its scope to human capital and do not look at other component of intellectual capital. Huselid (1995) examined the relationship between human capital and firm performance in a sample of 968 firms. He measured human capital by considering the education, experience, and tenure of the workforce. The study found a positive and significant association between human capital and various performance measures, including return on assets and market value. The findings suggested that investments in human capital positively impact firm value.

The result of this study on human capital and firm value does not align with the Human capital theory which deals with how education increases the productivity and efficiency of workers by increasing the level of their

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cognitive skills. The provision of education is seen as a productive investment in human capital, an investment which the proponents of the human capital theory consider to be equally worthwhile than that in physical capital.

Policy implication

The result shows a positive effect on human capital efficiency on company value in Nigeria. Which suggest that Nigeria regulators should encourage standardized disclosure of human capital metrics in annual report as intangible are not captured by traditional accounting.

- SEC/ financial Reporting council of Nigeria should issue a code of corporate governance addendum required disclosure of;

  i. Human capital efficiency metric
  ii. Annual hours of board continuing education by director

- Nigeria Exchange Group should create a Board competency Index as part of listing requirement
- Institution of Directors Nigeria (IOD) and chartered institution of stock brokers should mandate minimum annual (CPD) hours for listed company directors with sanctions for Non -compliance link renewal of director certification is training
- Firms/ Human capital and investors Relations publish human capital reports alongside financial staff productivity, training spend, retention, plus board training summary

CONCLUSION AND RECOMMENDATION

The results of this study on human capital efficiency and firm value does not align with the human capital theory which deals with how education increase the productivity and efficiency of workers by increasing the level of their cognitive skills The effect of human capital efficiency (HCE) on Tobin-q is negative and insignificant at 5% level. This means that the human capital efficiency (HCE) showed a detrimental effect on firm value, indicating that People are elements of the organization that are capable of learning, innovating, thinking creatively, initiating, and making changes. But most employees do not push for more knowledge but work according to scheduled duty, hence the negative influence to firm value due to monotony of work.

This study recommended that non-financial firms should engage in strong human capital investment by encouraging every staff to improve in their capacity either collectively or as individuals. Furthermore, the firms should encourage knowledge sharing among staff. The sharing of knowledge with others will benefit the organization by creating value.

Firms should ensure that board of directors continue to learning but not without core development in the area of the firms' interest. So that the interaction of board directors' educational background with specialized skills, it will result to enhanced firm value. Effective and efficient decision carried out by them will result to sustainable value creation.

REFERENCES

1. Chen, M. H., & Chang, Y. Y. (2013). The impacts of human capital in enhancing new venture's performance: Competence, motivation and creativity. Journal of Knowledge-based Innovation in China, 5(2), 146–168.
2. Chen, M. C., Cheng, S. J., & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms market value and financial performance. Journal of Intellectual Capital, 6(2), 159–176.
3. Cam, I., & Ozer, G. (2022). Intellectual capital and firm value: An investigation of Turkish manufacturing companies. Istanbul Business Research, 51(1), 257–277.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue IV April 2026

4. Costa, G., & Camuffo, A. (2014). The evolution of human resource management in Italy: A historical-institutional perspective. In The Development of Human Resource Management Across Nations, 269–299.
5. Clarke, M., Seng, D., & Whiting, R. H. (2011). Intellectual capital and firm performance in Australia. Journal of Intellectual Capital, 12(4), 505–530.
6. Dumay, J. (2016). A critical reflection on the future of intellectual capital: from reporting to disclosure. Journal of Intellectual Capital, 17(1), 168–184.
7. Edvinsson, L., & Malone, M. (1997). Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brain Power. HarperCollins.
8. Emekezimerh, F. A., & Opuofoni, C. A. (2024). Capital market and economic growth in Nigeria. Asian Journal of Economics, Banking and Accounting, 24(25), 297–309.
9. Fernando, W. H. M., Yusoff, S. K. M., Khatibi, A., & Azam, S. F. (2020). Human capital impact on organizational performance: Special reference to the banks in Sri Lanka. European Journal of Social Sciences Studies.
10. Jamal, W., & Saif, M. I. (2011). Impact of human capital management on organizational performance. European Journal of Economics, Finance and Administrative Sciences, 5(34), 13309–13315.
11. Khanna, P., Jones, C. D., & Boivie, S. (2014). Director human capital, information processing demands, and board effectiveness. Journal of Management, 40(2), 557–585.
12. Lestan, D. E., & Suryani, W. A. (2020). Firm's value exploration: The impact of intellectual capital and networking capital. Journal Dinamika Akuntansi, 12(2), 152–164.
13. Liu, Z., Chi, G. D., & Han, L. (2019). Board human capital and enterprise growth: A perspective of ambidextrous innovation. Sustainability, 11(14), 3993.
14. Nagyyen, H. A., & Doan, T. D. (2020). The impact of intellectual capital on firm value: Empirical evidence from Vietnam. International Journal of Financial Research, 11(4), 74–85.
15. Nadeem, M., Ganc, & Nguyenic. (2017). Does intellectual capital efficiency improve firm performance in BRICS economies? Measuring Business Excellence, 21(1), 65–85.
16. Oliveira, M., Curado, C., Balle, A. R., & Kianto, A. (2020). Knowledge sharing, intellectual capital and organizational results in SMEs: Are they related? Journal of Intellectual Capital, 22(4), 645–670.
17. Ramirez, Z. Y., Dieguez-Soto, J., & Manzaneque, M. (2020). How does intellectual capital efficiency affect firm performance? The moderating role of family management. International Journal of Productivity and Performance Management, 70(2), 297–324.
18. Romero, F. T., Ponce, Á. T., Córcoles, Y. R., & Pérez, M. D. M. L. (2023). Board leadership structure and human capital disclosure: Role of independent directors. European Research on Management and Business Economics, 29(3), 26–37.
19. Shairi, B. A. S., Mohammed, S. H., & Tuyon, J. (2021). Intellectual capital and firm performance: Evidence from technology sector in Malaysia. International Journal of Academic Research in Economics and Management Sciences, 10(1), 244–258.
20. Smriti, N., & Das, N. (2018). The impact of intellectual capital on firm performance: A study of Indian firms listed in COSPI. Journal of Intellectual Capital, 19(5), 935–964.
21. Tan, H. P., Plowman, D., & Hancock, P. (2007). Intellectual capital and financial returns of companies. Journal of Intellectual Capital, 8(1), 76–97.