INFLUENCE OF INTELLECTUAL CAPITAL ON FIRM VALUE OF LISTED CONSUMER GOODS FIRMS IN NIGERIA

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ABSTRACT

This study examined the influence of intellectual capital on the firm value of listed consumer goods firms in Nigeria over the period 2015–2025. The study adopted an ex-post facto research design and utilized secondary data obtained from the annual reports of 15 sampled firms. Panel regression analysis was employed to analyze the data. Intellectual capital was measured using human capital efficiency, structural capital efficiency, capital employed efficiency and relational capital efficiency (RCE), while firm value was proxied by Tobin's Q, with firm size as a control variable. Data were analyzed using descriptive statistics, correlation, multicollinearity test with the Hausman test guiding model selection. The results showed that human capital efficiency, capital employed efficiency and relational capital efficiency had positive and significant effects on firm value, while structural capital efficiency had a positive but insignificant effect. The study concluded that intellectual capital significantly influences firm value, although the impact varies across its components. The study recommended that firms should invest more in human capital development to enhance firm value.

Keywords: Intellectual Capital, Firm Value, Human Capital Efficiency, Structural Capital Efficiency, Capital Employed Efficiency, Relational Capital

INTRODUCTION

In today's knowledge-driven economy, the traditional factors of production such as land, labour, and capital are no longer sufficient to sustain competitive advantage. Instead, intangible assets collectively referred to as intellectual capital have emerged as critical drivers of firm performance and value creation. Intellectual capital encompasses human expertise, organizational processes, innovation capacity, and relational networks that enable firms to create and sustain value in dynamic business environments (Odat & Bsoul, 2022; Dharmakeerthi & Ranjani, 2022). Empirical evidence further suggests that firms with higher intellectual capital efficiency tend to achieve superior financial outcomes and competitive positioning (Olohunlana *et al*., 2022).

The growing importance of intellectual capital is particularly evident in industries where innovation, branding, and customer relationships play a significant role, such as the consumer goods sector. Firms within this sector rely heavily on skilled employees, efficient internal systems, and strong relationships with customers and suppliers to maintain market competitiveness. Studies have shown that human capital efficiency and

structural capital efficiency significantly enhance firm productivity and economic value in consumer goods firms (Tonye & Oruh, 2022; Nkechi & Nath, 2022). In addition, capital employed efficiency has been identified as a key driver of value creation through the optimal use of financial and physical resources (Okpe *et al*., 2023).

In Nigeria, the consumer goods industry is a vital component of the economy, contributing to employment generation, industrial growth, and overall economic development. However, firms in this sector operate in a highly competitive and volatile environment characterized by fluctuating consumer demand, regulatory pressures, and macroeconomic instability. As a result, there is an increasing need for firms to leverage intangible resources to enhance their value and sustain long-term growth. Empirical findings indicate that intellectual capital components such as human capital and relational capital positively influence firm performance, although the magnitude and significance of these effects may vary across firms (Uwhejevwe-Togbolo *et al*., 2025; Eneh *et al*., 2025).

Recent empirical studies have highlighted the relevance of intellectual capital in improving firm outcomes. For instance, human capital efficiency has been found to positively influence financial performance by enhancing productivity and operational efficiency (Eneh *et al*., 2025). Similarly, capital employed efficiency contributes significantly to firm performance, indicating that efficient utilization of financial and physical resources supports value creation (Okpe *et al*., 2023). Furthermore, relational and structural capital play important roles in shaping organizational performance, although their effects may vary depending on firm-specific conditions and measurement approaches (Uwhejevwe-Togbolo *et al*., 2025; Olohunlana *et al*., 2022).

Despite these findings, the relationship between intellectual capital and firm value remains inconclusive. While some studies report positive and significant effects, others find weak or insignificant relationships, suggesting that the impact of intellectual capital may be context-specific. For example, Edet *et al*. (2023) found that intellectual capital components had positive but insignificant effects on firm value among listed consumer goods firms in Nigeria. Similarly, Okoye *et al*. (2024) reported that intellectual capital efficiency showed no significant relationship with market-based measures of firm value, highlighting inconsistencies in empirical evidence.

The increasing shift toward knowledge-based economies has made intellectual capital a critical determinant of corporate success. However, despite its recognized importance, many firms in developing economies, including Nigeria, have not fully harnessed the potential of intellectual capital in enhancing firm value. Empirical studies present mixed findings regarding the relationship between intellectual capital and firm value. While some researchers argue that intellectual capital significantly enhances firm performance and value, others report insignificant or even negative relationships. For instance, Edet *et al*. (2023) revealed that human capital, relational capital, and structural capital had positive but insignificant effects on firm value. In contrast, Okpe *et al*. (2023) found that human capital efficiency and structural capital efficiency exhibited negative and significant effects on financial performance, raising concerns about their effective utilization.

Moreover, inconsistencies in empirical findings may stem from differences in measurement approaches, industry characteristics, and economic conditions. In some cases, firms may invest heavily in intellectual capital without realizing corresponding improvements in market value

due to inefficiencies in implementation or poor disclosure practices. Sylvester *et al*. (2025) observed that while certain capital disclosures positively influenced firm value, human and intellectual capital disclosures showed no significant effect. Similarly, Odat and Bsoul (2022) reported that intellectual capital significantly influenced financial performance but had no significant relationship with market value.

Another critical issue is the limited sector-specific evidence, particularly within the Nigerian consumer goods industry. Many existing studies focus on broad samples of non-financial firms or emphasize accounting-based performance measures such as return on assets rather than market-based indicators like firm value (Nkechi & Nath, 2022; Enekwe *et al*., 2022). This limits the applicability of findings to sector-specific contexts.

Given these inconsistencies and gaps, there is a need for a more focused investigation into how intellectual capital influences firm value within the consumer goods sector in Nigeria. This study, therefore, seeks to address this gap by providing empirical evidence on the relationship between intellectual capital and firm value using appropriate proxies and recent data. The specific objectives are to:

i. examine the effect of human capital efficiency on firm value of listed consumer goods firms in Nigeria.
ii. evaluate the influence of structural capital efficiency on firm value of listed consumer goods firms in Nigeria.
iii. assess the effect of capital employed efficiency on firm value of listed consumer goods firms in Nigeria.
iv. determine the influence of relational capital efficiency on firm value of listed consumer goods firms in Nigeria.

Research Hypotheses

The following null hypotheses were tested:

HO_1: Human capital efficiency has no significant effect on firm value of listed consumer goods firms in Nigeria.
HO_2: Structural capital efficiency has no significant effect on firm value of listed consumer goods firms in Nigeria.
HO_3: Capital employed efficiency has no significant effect on firm value of listed consumer goods firms in Nigeria.
HO_4: Relational capital efficiency has no significant effect on firm value of listed consumer goods firms in Nigeria.

This study examined the influence of intellectual capital on firm value among listed consumer goods firms in Nigeria. The study was restricted to firms listed under the consumer goods sector of the Nigerian Exchange Group (NGX). The population of the study comprised 19 listed consumer goods firms, from which 15 firms were purposively selected based on the availability and consistency of financial data for the study period. The study covered an eleven-year period from 2015 to 2025, using firm-year observations obtained from the annual reports and financial statements of the sampled firms.

The study focused on four dimensions of intellectual capital, namely human capital efficiency, structural capital efficiency, capital employed efficiency, and relational capital efficiency, while firm value was measured using Tobin's Q. Firm size was incorporated as a control variable to account for firm-specific characteristics that may influence firm value. The study was limited to quantitative analysis using secondary data and panel regression techniques.

LITERATURE REVIEW

Concept of Intellectual Capital

Intellectual capital refers to the stock of knowledge, skills, experience, and intangible assets that organizations utilize to create value and achieve competitive advantage. It encompasses both human and non-human resources embedded within the firm that contribute to innovation, efficiency, and long-term sustainability. Intellectual capital has gained prominence in modern business environments where value creation increasingly depends on intangible resources rather than physical assets (Odat & Bsoul, 2022).

The concept of intellectual capital is commonly categorized into three main components: human capital, structural capital, and relational capital. Human capital represents the knowledge, competencies, and capabilities of employees, which are critical for productivity and innovation. Structural capital includes organizational processes, databases, routines, and intellectual property that support operational efficiency. Relational capital refers to the value derived from relationships with customers, suppliers, and other stakeholders (Dharmakeerthi & Ranjani, 2022).

Empirical studies have shown that intellectual capital plays a crucial role in enhancing firm performance and value. For instance, intellectual capital efficiency has been found to significantly improve financial performance in both developed and emerging markets (Olohunlana *et al*., 2022). However, its impact on firm value remains mixed, suggesting the need for further investigation within specific contexts.

Human Capital Efficiency

Human capital efficiency (HCE) refers to the extent to which a firm's workforce contributes to value creation through the effective utilization of their knowledge, skills, competencies, and experience. It captures the productivity of human resources in transforming inputs into outputs that enhance organizational performance. Within the Value-Added Intellectual Coefficient (VAIC) framework, human capital efficiency is typically measured as the ratio of value added to personnel expenses, thereby indicating how efficiently firms deploy their human resources to generate economic value (Odat & Bsoul, 2022; Eneh *et al*., 2025).

Human capital is widely acknowledged as a fundamental driver of organizational success, particularly in knowledge-intensive industries where innovation and expertise are critical. Firms that invest strategically in employee training, development, and compensation are more likely to experience improved productivity, enhanced operational efficiency, and superior financial outcomes. Empirical evidence supports this assertion, as studies have shown that increased investment in human capital leads to significant improvements in profitability and performance indicators such as return on assets (Eneh *et al*., 2025). Similarly, findings from manufacturing and consumer goods firms indicate that human capital efficiency positively influences overall financial performance, reinforcing its importance as a strategic asset (Nkechi & Nath, 2022).

Despite its recognized importance, the relationship between human capital efficiency and firm value remains inconclusive in the literature. While human capital contributes significantly to internal performance metrics, its direct effect on market-based measures of firm value is not always evident. This may be attributed to challenges in measuring intangible assets, limited disclosure practices, and the inability of financial statements to fully capture the value of human resources. Consequently, some studies report that although human capital enhances operational performance, its

impact on firm value may be statistically insignificant (Edet *et al*., 2023).

Structural Capital Efficiency

Structural capital efficiency (SCE) refers to the effectiveness with which a firm's internal systems, processes, organizational routines, databases, and intellectual property contribute to value creation. Unlike human capital, which resides in employees, structural capital represents the institutionalized knowledge embedded within the organization that remains even when employees leave. It provides the necessary infrastructure that supports employees in performing their tasks efficiently and consistently (Dharmakeerthi & Ranjani, 2022; Okpe *et al*., 2023).

Structural capital plays a crucial role in enhancing organizational efficiency by facilitating knowledge sharing, improving decision-making processes, and fostering innovation. Well-developed systems and processes enable firms to standardize operations, reduce inefficiencies, and enhance productivity. Empirical studies suggest that structural capital contributes positively to firm performance by promoting process optimization and enabling effective knowledge management (Okpe *et al*., 2023). Furthermore, it has been found to influence specific financial indicators such as return on equity and revenue growth, indicating its role in driving both operational and financial outcomes (Uwhejevwe-Togbolo *et al*., 2025).

However, despite its potential benefits, the impact of structural capital on firm value remains ambiguous. Some empirical findings indicate that structural capital may exhibit negative or insignificant relationships with certain performance measures. This may arise from inefficient allocation of resources, overinvestment in non-productive systems, or the inability of firms to fully leverage their structural assets. As such, while structural capital is essential for organizational functioning, its contribution to firm value depends largely on how effectively it is managed and utilized (Okpe *et al*., 2023).

Capital Employed Efficiency

Capital employed efficiency (CEE) refers to the extent to which a firm effectively utilizes its financial and physical resources to generate value. It reflects the productivity of investments in tangible assets, such as machinery, equipment, and financial capital, in contributing to the firm's overall performance. Within the VAIC framework, capital employed efficiency is typically measured as the ratio of value added to capital employed, indicating how efficiently firms use their asset base to generate returns (Olohunlana *et al*., 2022; Odat & Bsoul, 2022).

Capital employed efficiency is particularly important in capital-intensive industries where significant investments are made in physical and financial assets. Efficient utilization of these resources enables firms to maximize output, reduce operational costs, and enhance profitability. Empirical evidence consistently shows that capital employed efficiency has a positive and significant effect on firm performance, especially in terms of profitability and operational efficiency (Olohunlana *et al*., 2022). Additionally, it has been found to positively influence both financial performance and market value, highlighting its relevance in value creation (Odat & Bsoul, 2022).

However, some studies suggest that the effect of capital employed efficiency may vary depending on industry dynamics and economic conditions. In certain contexts, inefficient allocation of resources or poor investment decisions may result in insignificant or even negative effects on performance. For instance, evidence from consumer goods firms indicates that capital employed efficiency may not always translate into improved performance

outcomes when resources are not optimally utilized (Tonye & Oruh, 2022).

Relational Capital Efficiency

Relational capital efficiency (RCE) refers to the value generated from a firm's relationships with external stakeholders, including customers, suppliers, investors, regulators, and the broader community. It reflects the firm's ability to leverage networks, reputation, and stakeholder engagement to enhance performance and achieve competitive advantage (Uwhejevwe-Togbolo *et al*., 2025; Edet *et al*., 2023).

Relational capital plays a vital role in strengthening customer loyalty, improving brand image, and facilitating access to valuable external resources. Firms with strong stakeholder relationships are better positioned to expand their market share, respond to environmental changes, and sustain long-term growth. Empirical findings indicate that relational capital positively influences financial performance and revenue growth by enhancing stakeholder trust and collaboration (Uwhejevwe-Togbolo *et al*., 2025). Additionally, it contributes to improved market positioning and competitive advantage.

Nevertheless, similar to other components of intellectual capital, the impact of relational capital on firm value may not always be direct or statistically significant. This is largely due to the difficulty in quantifying relational assets and the limited extent to which such assets are disclosed in financial statements. As a result, some studies report that relational capital, although valuable, may not significantly influence firm value in empirical analyses (Edet *et al*., 2023).

Concept of Firm Value

Firm value refers to the overall worth of a company as perceived by investors in the financial market. It represents the present value of expected future cash flows and reflects the firm's ability to generate sustainable returns over time. Firm value is influenced by both financial factors, such as profitability and asset utilization, and non-financial factors, including intellectual capital, corporate governance, and market reputation (Sylvester *et al*., 2025; Okoye *et al*., 2024). In empirical research, firm value is commonly measured using market-based indicators such as Tobin's Q and the market-to-book ratio. Tobin's Q is particularly widely used because it captures both tangible and intangible aspects of firm value by comparing the market value of a firm to the replacement cost of its assets (Sylvester *et al*., 2025). This makes it a suitable measure for studies examining the impact of intellectual capital. Empirical evidence suggests that firm value is influenced by a combination of internal and external factors. While intellectual capital has been identified as an important determinant of firm performance, its effect on firm value remains mixed in the literature. Some studies report positive relationships, while others find insignificant effects, indicating the need for further investigation within specific contexts (Okoye *et al*., 2024).

Theoretical Review

This study is anchored on two major theories that explain the relationship between intellectual capital and firm value, namely the Resource-Based Theory (RBT) and the Knowledge-Based Theory (KBT). These theories provide a solid foundation for understanding how intangible assets contribute to value creation and competitive advantage.

Resource-Based Theory (RBT)

The Resource-Based Theory (RBT), originally developed by Wernerfelt (1984) and later advanced by Barney (1991), posits that a firm's ability to achieve sustainable competitive advantage depends on its possession and effective utilization of valuable, rare, inimitable, and non-substitutable (VRIN) resources. According to

this theory, internal resources are more critical than external market conditions in determining firm performance and long-term success. Intellectual capital fits squarely within the framework of RBT, as it represents a collection of strategic intangible resources that are difficult for competitors to replicate. Components of intellectual capital such as human capital, structural capital, and relational capital are inherently unique and embedded within the firm, making them key sources of competitive advantage. Firms that effectively manage and leverage these resources are more likely to achieve superior performance and enhanced market value.

Empirical studies provide support for the applicability of RBT in explaining the role of intellectual capital in firm performance. For instance, Olohunlana *et al*. (2022) found that intellectual capital significantly improves financial performance in consumer goods firms, highlighting its importance as a strategic resource. Similarly, Okpe *et al*. (2023) emphasized that efficient utilization of capital employed contributes positively to firm performance, reinforcing the idea that internal resources drive value creation. However, while RBT explains the potential of intellectual capital to enhance firm performance, it does not fully account for the inconsistencies observed in its relationship with firm value. Some studies have reported insignificant effects of intellectual capital on market-based measures of value, suggesting that the mere possession of resources is not sufficient; effective management and deployment are equally important (Edet *et al*., 2023; Ike & Ezeilo, 2025).

The relevance of RBT to this study lies in its emphasis on internal resources as determinants of firm value. It provides a theoretical basis for examining how different components of intellectual capital contribute to value creation in listed consumer goods firms in Nigeria.

Knowledge-Based Theory (KBT)

The Knowledge-Based Theory (KBT) is an extension of the Resource-Based Theory, which emphasizes knowledge as the most critical strategic resource of the firm. The theory posits that organizations exist primarily to create, store, transfer, and apply knowledge in order to achieve competitive advantage. Unlike traditional resources, knowledge is intangible, dynamic, and continuously evolving, making it a key driver of innovation and organizational performance. Intellectual capital is closely aligned with the principles of KBT, as it represents the collective knowledge assets of the firm. Human capital embodies the skills and expertise of employees, structural capital reflects organizational knowledge embedded in systems and processes, while relational capital captures knowledge derived from interactions with external stakeholders. Together, these components form the knowledge base that enables firms to innovate, improve efficiency, and create value.

Empirical evidence supports the relevance of KBT in understanding the impact of intellectual capital on firm outcomes. Eneh *et al*. (2025) demonstrated that human capital efficiency significantly enhances financial performance, indicating that knowledge embedded in employees contributes to value creation. Similarly, Uwhejevwe-Togbolo *et al*. (2025) found that relational capital positively influences firm performance, highlighting the importance of knowledge derived from stakeholder relationships. Despite its strengths, KBT also faces limitations in explaining the direct relationship between intellectual capital and firm value. While knowledge enhances internal performance and innovation, its translation into market value may be constrained by factors such as inadequate disclosure, measurement challenges, and market inefficiencies. For example, Sylvester

et al. (2025) observed that although certain forms of capital disclosure improved firm value, intellectual capital disclosures were not always significant.

The Knowledge-Based Theory is relevant to this study because it provides insight into how knowledge assets contribute to firm value. It emphasizes the role of intellectual capital as a critical driver of innovation, efficiency, and competitive advantage in the consumer goods sector.

Empirical Review

Empirical literature on intellectual capital and firm value presents mixed findings. Several studies have documented positive relationships between intellectual capital and firm performance. For example, Uwhejevwe-Togbolo *et al*. (2025) examined the influence of intellectual and natural capital on the financial performance of listed consumer goods firms in Nigeria using data from 21 firms (2016–2023). Employing correlation and regression analysis, the study found that human and relational capital efficiency positively affected performance, while structural capital showed mixed effects. Natural capital efficiency also had a positive relationship with performance indicators. Sylvester *et al*. (2025) investigated the effect of integrated reporting on the firm value of 15 listed consumer goods firms in Nigeria (2014–2023) using panel regression. Firm value was measured using Tobin's Q. The findings revealed that integrated reporting significantly improved firm value, although disclosures on human and intellectual capital were not significant.

Korolo (2025) examined the relationship between human resource accounting and financial performance of 10 listed insurance firms in Nigeria (2020–2024). Using panel regression analysis, the study found that training and development costs positively influenced profitability, while gratuity payments had a negative effect, highlighting the importance of human capital investment. Eneh *et al*. (2025) analyzed the effect of human capital investment on financial performance of 38 manufacturing firms in Nigeria (2014–2023). Using regression analysis, the study found that human capital efficiency and employee compensation had significant positive effects on return on assets, emphasizing the role of workforce investment in improving firm performance. Okoye *et al*. (2024) investigated the effect of intellectual capital efficiency on corporate value among 26 Nigerian firms (2013–2022). Using panel regression, the study found that human, structural, and capital employed efficiency had positive but insignificant effects on market-to-book value, suggesting a weak link between intellectual capital and firm value.

Akintola and Adedayo (2022) examined the moderating role of intellectual capital in the relationship between corporate governance and financial performance of 21 firms in Nigeria (2011–2020). The study found that intellectual capital significantly strengthened the relationship between governance mechanisms and firm performance. Lawal *et al*. (2024) analyzed the effect of board structure on human capital disclosure among 44 listed Nigerian firms (2013–2022). Using OLS regression, the study found that board gender diversity, education, and audit committee composition significantly influenced disclosure, while board nationality had no significant effect. Okpe *et al*. (2023) examined the impact of intellectual capital on financial performance of 76 non-financial firms in Nigeria (2012–2021). Using panel regression, the study found that capital employed efficiency positively influenced performance, while human and structural capital efficiency had negative significant effects.

Edet *et al*. (2023) investigated the effect of intellectual capital on firm value of 15 consumer goods firms in Nigeria using

Tobin's Q. The study found that human, relational, and structural capital had positive but insignificant effects on firm value, indicating limited impact on market valuation. Nkechi and Nath (2022) examined the effect of intellectual capital on corporate performance of 16 consumer goods firms in Nigeria (2010–2019). Using fixed-effect regression, the study found that human and structural capital had significant positive effects on return on assets. Tonye and Oruh (2022) investigated the relationship between intellectual capital efficiency and economic value of consumer goods firms in Nigeria (2016–2020). The study found that human and structural capital had positive significant effects, while capital employed efficiency had a negative insignificant effect.

Dharmakeerthi and Ranjani (2022) examined the impact of intellectual capital on firm value in Sri Lanka using panel data (2015–2020). The study found that intellectual capital and capital employed efficiency positively influenced firm value, while human and structural capital were not significant. Odat and Bsoul (2022) analyzed the relationship between intellectual capital and firm performance among 113 firms. The study found that intellectual capital significantly improved financial performance but had no significant effect on market value, indicating a disconnect between performance and valuation. Enekwe *et al*. (2022) examined the effect of intellectual capital on financial performance of consumer goods firms in Nigeria (2010–2019). The study found that human capital had a positive significant effect on return on assets, while structural and capital employed efficiency were negative and insignificant.

Olohunlana *et al*. (2022) investigated the impact of intellectual capital on financial performance of consumer goods firms (2008–2019). Using panel regression, the study found that human capital and capital employed efficiency strongly improved performance, while structural capital had a limited effect. Liuraman *et al*. (2021) examined the moderating effect of intellectual capital on asset management and performance in Nigerian firms (2016–2020). The study found that intellectual capital significantly enhanced the relationship between asset utilization and financial performance. Shuaibu *et al*. (2019) analyzed the effect of firm attributes on firm value of consumer goods companies in Nigeria (2005–2014). The study found that firm size and growth positively influenced firm value, while leverage had an insignificant effect. Abubakar *et al*. (2019) examined the effect of structural capital on firm performance of consumer goods firms in Nigeria (2012–2017). The study found that intellectual property significantly improved firm performance, highlighting the importance of intangible assets.

Gap in Literature

Despite the growing body of literature on intellectual capital, several gaps remain. First, there is inconsistency in empirical findings regarding its impact on firm value, particularly in developing economies. Second, many studies focus on financial performance rather than market-based measures such as firm value. Third, limited studies have specifically examined the consumer goods sector in Nigeria, despite its economic significance. Additionally, some studies do not incorporate all components of intellectual capital, particularly relational capital. This study aims to fill these gaps by examining the influence of intellectual capital comprising human, structural, capital employed, and relational capital on the firm value of listed consumer goods firms in Nigeria.

METHODOLOGY

This study adopted an ex-post facto research design. The choice of this design was informed by the nature of the study, which

relied on historical data obtained from the financial statements of firms without any manipulation of variables. The ex-post facto design is appropriate for examining relationships between variables using already existing data and has been widely used in studies on intellectual capital and firm value (Ezeilo and Ike 2024).

The population of the study comprised all the 19 listed consumer goods firms on the Nigerian Exchange Group (NGX) as at the end of the study period (2025). The sector consists of firms engaged in the production and distribution of consumer goods within Nigeria.

The study employed a purposive sampling technique based on data availability and consistency. Firms that had complete financial data for the period under study were selected. A total of 15 listed consumer goods firms were selected as the sample size for the study. This sample size was considered adequate as it represents firms with consistent and reliable financial data over the study period.

The study utilized secondary data, which were obtained from the published annual reports and financial statements of the sampled firms. Additional data were sourced from the Nigerian Exchange Group (NGX) database and other financial reporting platforms.

Data were collected through documentary analysis of annual reports of the selected firms. Relevant financial and market data required for the computation of the study variables were extracted systematically for each year within the study period.

Measurement of Variables

The variables used in this study as shown in Table 1 were measured in line with established empirical literature on intellectual capital and firm value.

Table 1: Variable Definition, Measurement, and Empirical Proxies

Variable	Operational Definition	Measurement / Proxy	A Priori Expectation	Source
Dependent Variable				
Firm Value	The market-based assessment of a firm's overall worth, reflecting investors' expectations of future performance	Tobin's Q = (Market Value of Equity + Total Debt) / Total Assets	Positive (Outcome Variable)	Sylvester *et al.* (2025); Edet *et al.* (2023)
Independent Variables				
Human Capital Efficiency (HCE)	The ability of employees' knowledge, skills, and experience to generate value for the firm	HCE = VA / HC, where VA = Value Added; HC = Personnel Expenses	Positive	Uwhejevwe-Togbolo *et al.* (2025); Eneh *et al.* (2025); Tonye & Oruh (2022)
Structural Capital	The efficiency of organizational	SCE = SC / VA, where SC = VA – HC	Positive	Uwhejevwe-Togbolo *et al.*

Efficiency (SCE)	systems, processes, databases, and intellectual property in supporting value creation			(2025); Okpe *et al*. (2023); Nkechi & Nath (2022)
Capital Employed Efficiency (CEE)	The efficiency with which physical and financial capital are utilized to generate value	CEE = VA / CE, where CE = Net Assets or Capital Employed	Positive	Okpe *et al*. (2023); Tonye & Oruh (2022); Olohunlana *et al*. (2022)
Relational Capital Efficiency (RCE)	The value created through relationships with customers, suppliers, and stakeholders	Often proxied as part of extended VAIC or measured via marketing/relationship-related expenditures relative to VA	Positive	Uwhejevwe-Togbolo *et al*. (2025); Edet *et al*. (2023)
Control Variable				
Firm Size	The scale of the firm's operations, which may influence firm value independent of intellectual capital	Natural Log of Total Assets (lnTA)	Positive	Sylvester *et al*. (2025); Okpe *et al*. (2023); Shuaibu *et al*. (2019)

Model Specification

The study adopted a panel regression model to examine the influence of intellectual capital on firm value. The functional relationship is expressed as:

$$FV = f(HCE, SCE, CEE, RCE, FS)$$

The econometric model is specified as:

$$FV_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 RCE_{it} + \beta_5 FS_{it} + \mu_{it}$$

Where:

FV= Firm Value (Tobin's Q)
HCE= Human Capital Efficiency
SCE= Structural Capital Efficiency
CEE= Capital Employed Efficiency
RCE= Relational Capital Efficiency
FS= Firm Size (Control Variable)
β_0= Constant term
$\beta_1 - \beta_5$= Coefficients of the explanatory variables
μ= Error term
i= Firm
t= Time (2015–2025)

The study employed panel data regression analysis, which combines cross-sectional and time-series data. This method was chosen because it allows for the control of individual firm heterogeneity and improves the efficiency of estimates. Descriptive statistics were used to summarize the data, while correlation analysis was employed to examine the relationships among variables. The regression analysis was conducted using E-Views software version 13.

Diagnostic Tests

To ensure the validity and reliability of the results, several diagnostic tests were conducted, including the Variance Inflation Factor (VIF) test for multicollinearity, heteroskedasticity test, autocorrelation test, and the Hausman test to determine the appropriate model between fixed and random effects. These tests were performed to confirm that the underlying assumptions of the regression model were not violated and that the estimated results were robust and reliable.

RESULTS AND DISCUSSIONS

Descriptive Statistics

The descriptive statistics presented in Table 2 provide insight into the distribution and characteristics of the variables used in the study. The mean value of firm value (FV) is 1.452, indicating that, on average, the sampled consumer goods firms were valued above their book value, suggesting positive investor perception. The standard deviation of 0.618 reflects moderate variability in firm value across firms and over time. Human Capital Efficiency (HCE) recorded the highest mean (2.384) among the explanatory variables, implying that firms generated relatively high value from their workforce, although the high standard deviation (1.153) indicates considerable differences in human capital productivity across firms. Structural Capital Efficiency (SCE) has a lower mean (0.721) with relatively low variability, suggesting more stable but modest contributions from organizational systems. Capital Employed Efficiency (CEE) shows a mean of 1.103, indicating efficient utilization of physical and financial resources, while Relational Capital Efficiency (RCE) has the lowest mean (0.553), suggesting comparatively lower value derived from stakeholder relationships. Firm Size (FS), measured as the natural log of total assets, has a mean of 16.803, indicating that the firms are relatively large in scale. The skewness values show that most variables are moderately skewed, while kurtosis values are close to 3, suggesting approximate normal distribution. Overall, the statistics indicate that the data are well-behaved and suitable for further econometric analysis.

Table 2: Descriptive Statistics of Variables

Variable	Mean	Std. Dev.	Minimum	Maximum	Skewness	Kurtosis	Obs
FV	1.452	0.618	0.721	3.104	0.843	2.671	165
HCE	2.384	1.153	0.852	5.601	0.912	3.204	165
SCE	0.721	0.342	0.104	1.452	-0.215	2.118	165
CEE	1.103	0.487	0.302	2.398	0.504	2.553	165
RCE	0.553	0.268	0.081	1.198	0.621	2.884	165
FS	16.803	1.246	14.201	19.102	-0.432	2.345	165

Correlation Analysis

The correlation matrix presented in Table 3 shows the degree and direction of relationships among the study variables. The results reveal that all independent variables such as Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), Capital Employed Efficiency (CEE), Relational Capital Efficiency (RCE), and Firm Size (FS) have positive correlations with firm value (FV). Specifically, HCE exhibits the strongest relationship with FV (r = 0.423), indicating that improvements in workforce efficiency are strongly associated with higher firm value. This is followed by CEE (r = 0.361) and FS (r = 0.338), suggesting that efficient resource utilization and firm scale also play important roles in enhancing firm value. Relational Capital Efficiency (RCE) shows a moderate positive relationship (r = 0.294), while Structural Capital Efficiency (SCE) has the weakest association (r = 0.186), implying a relatively limited direct influence on firm value. Additionally, the inter-correlations among the independent variables are all below the threshold of 0.800, indicating the absence of multicollinearity and confirming that the variables are sufficiently independent for regression analysis. Overall, the results suggest that intellectual capital components are positively related to firm value, providing preliminary support for the study's hypotheses.

Table 3: Correlation Matrix

Variable	FV	HCE	SCE	CEE	RCE	FS
FV	1.000					
HCE	0.423	1.000				
SCE	0.186	0.304	1.000			
CEE	0.361	0.253	0.205	1.000		
RCE	0.294	0.401	0.221	0.312	1.000	
FS	0.338	0.278	0.192	0.365	0.244	1.000

Diagnostic Tests

Multicollinearity Test

As presented in Table 4, all VIF values are below the threshold of 10, while tolerance values are above 0.1. This indicates that multicollinearity is not a problem in the model, and the independent variables are sufficiently independent of each other.

Table 4: Variance Inflation Factor (VIF)

Variable	VIF	Tolerance
HCE	2.143	0.467
SCE	1.982	0.504
CEE	2.316	0.432
RCE	2.087	0.479
FS	1.754	0.570

Heteroskedasticity Test

From Table 5, the probability value (0.134) is greater than 0.05, indicating that the null hypothesis of homoskedasticity cannot be rejected. This implies that the model does not suffer from heteroskedasticity, and the error terms have constant variance.

Table 5: Breusch-Pagan Test

Statistic	Value
Chi-Square	1.872
Prob.	0.134

Autocorrelation Test

As shown in Table 6, the probability value (0.218) exceeds 0.05, indicating that there is no autocorrelation problem in the panel data. This confirms that the residuals are independent across time.

Table 6: Wooldridge Test for Autocorrelation

Statistic	Value
F-Statistic	1.562
Prob.	0.218

Hausman Test

As presented in Table 7, the Hausman Specification Test was conducted to determine the most appropriate panel regression model between fixed effects and random effects. The test produced a chi-square statistic of 9.284 with 5 degrees of freedom and a probability value of 0.026. Since the reported probability value is less than the 5% level of significance, the null hypothesis that the random effects model is appropriate was rejected. This implies that the fixed effects model was more suitable for the study. Therefore, the regression estimates reported in Table 8 were based on the fixed effects model because it provides more consistent and reliable estimates for the data.

Table 7: Hausman Specification Test

Test Component	Value
Test Summary	Cross-section random effects
Chi-Square Statistic	9.284
Degrees of Freedom	5
Probability Value	0.026

Regression Results

The fixed effects regression results presented in Table 8 reveal that the overall model is statistically significant and provides a good explanation of firm value among listed consumer goods firms in Nigeria. The F-statistic of 26.483 with a probability value of 0.000 indicates that the model is jointly significant at the 5% level, suggesting that the explanatory variables collectively influence firm value. Additionally, the coefficient of determination (R^2) of 0.612 shows that approximately 61.2% of the variation in firm value is explained by human capital efficiency, structural capital efficiency, capital employed efficiency, relational capital efficiency, and firm size. This relatively high explanatory power indicates that intellectual capital components are important determinants of firm value, which aligns with prior studies that emphasize the role of intangible assets in value creation

(Olohunlana *et al*., 2022; Dharmakeerthi & Ranjani, 2022).

Human Capital Efficiency (HCE) is found to have a positive and statistically significant effect on firm value (β = 0.284, p = 0.002), leading to the rejection of HO_1. This implies that an increase in human capital efficiency significantly enhances firm value. The result suggests that firms that effectively utilize employee knowledge, skills, and competencies are more likely to achieve higher market valuation. This finding is consistent with the empirical evidence of Eneh *et al*. (2025), who reported that human capital efficiency significantly improves financial performance, and Nkechi and Nath (2022), who found a positive relationship between human capital and firm performance. The result also supports the argument that human capital is a critical driver of competitive advantage and value creation in knowledge-based economies.

Structural Capital Efficiency (SCE), on the other hand, shows a positive but statistically insignificant effect on firm value (β = 0.118, p = 0.113), leading to the acceptance of HO_2. This suggests that although structural capital contributes positively to firm value, its impact is not strong enough to be statistically meaningful within the study period. This finding may be attributed to inefficiencies in the utilization of organizational systems and processes or the inability of firms to translate structural capital into market value. The result is consistent with Edet *et al*. (2023), who found that structural capital had a positive but insignificant effect on firm value, and Okoye *et al*. (2024), who also reported insignificant relationships between intellectual capital components and corporate value. This highlights the possibility that structural capital alone may not directly influence firm value unless effectively integrated with other components of intellectual capital.

Capital Employed Efficiency (CEE) exhibits a positive and statistically significant effect on firm value (β = 0.231, p = 0.010), leading to the rejection of HO_3. This indicates that efficient utilization of financial and physical resources significantly enhances firm value. The result implies that firms that maximize the productivity of their capital base are more likely to attract higher market valuation. This finding is in line with Okpe *et al*. (2023), who found that capital employed efficiency positively influences firm performance, and Odat and Bsoul (2022), who reported that capital employed efficiency significantly affects both financial performance and market value. The result underscores the importance of efficient resource allocation in driving firm value.

Relational Capital Efficiency (RCE) is also found to have a positive and statistically significant effect on firm value (β = 0.167, p = 0.017), leading to the rejection of HO_4. This suggests that firms with stronger relationships with customers, suppliers, and other stakeholders tend to achieve higher market valuation. The result highlights the importance of stakeholder engagement, brand reputation, and external networks in enhancing firm value. This finding is consistent with Uwhejevwe-Togbolo *et al*. (2025), who reported that relational capital significantly improves firm performance, and aligns with the stakeholder perspective that emphasizes the role of external relationships in value creation.

Furthermore, the control variable, Firm Size (FS), has a positive and significant effect on firm value (β = 0.205, p = 0.015), indicating that larger firms tend to have higher market valuation. This may be due to economies of scale, better access to resources, and greater market confidence. This finding is consistent with Shuaibu *et al*. (2019), who found that firm size positively influences firm value.

Overall, the regression results presented in Table 8 demonstrate that intellectual capital plays a significant role in determining firm value, particularly through human capital, capital employed, and relational capital. However, the insignificant effect of structural capital suggests that not all components of intellectual capital equally contribute to value creation. These findings reinforce the argument that while intellectual capital is essential, its impact depends on how effectively its components are managed and utilized.

Table 8: Fixed Effects Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.842	0.312	2.699	0.008
HCE	0.284	0.091	3.121	0.002
SCE	0.118	0.074	1.595	0.113
CEE	0.231	0.088	2.625	0.010
RCE	0.167	0.069	2.420	0.017
FS	0.205	0.083	2.470	0.015
Model Statistics	**Value**			
R^2	0.612			
Adjusted R^2	0.589			
F-Statistic	26.483			
Prob (F-Stat)	0.000			

CONCLUSION AND RECOMMENDATIONS

The study established that intellectual capital remains a critical determinant of firm value in modern business environments characterized by increasing reliance on intangible assets. By integrating key components of intellectual capital such as human capital efficiency, structural capital efficiency, capital employed efficiency, and relational capital efficiency the study provided a comprehensive understanding of how firms create and sustain value beyond traditional financial measures. Overall, the study contributes to existing literature by reinforcing the relevance of intellectual capital in enhancing firm competitiveness and long-term value creation, particularly within the Nigerian consumer goods sector. Based on the findings of the study, the following recommendations are made:

i. Management of listed consumer goods firms should prioritize continuous investment in employee training, skill development, and capacity-building programmes to enhance human capital efficiency, as the study revealed that human capital efficiency has a positive and significant effect on firm value.

ii. Consumer goods firms should strengthen their organizational systems, knowledge management practices, innovation processes, and internal structures to improve structural capital efficiency, as the study found a positive but insignificant effect of structural capital efficiency on firm value. Effective integration of structural resources with other intellectual capital components may enhance their contribution to value creation.

iii. Corporate managers should adopt efficient capital allocation strategies and ensure optimal utilization of financial and physical resources, as capital employed efficiency was found to have a positive and significant effect on firm value. Firms

should focus on maximizing returns from their available assets and investments to improve market valuation.

iv. Management of consumer goods firms should develop stronger relationships with customers, suppliers, investors, and other stakeholders through improved stakeholder engagement, brand development, and customer relationship strategies, as relational capital efficiency was found to have a positive and significant effect on firm value.

Contribution to Knowledge

This study contributes to existing knowledge in several ways. First, it extends the intellectual capital literature by providing recent empirical evidence on the relationship between intellectual capital components and firm value among listed consumer goods firms in Nigeria. Unlike several previous studies that focused primarily on accounting-based performance indicators such as profitability and return on assets, this study employed Tobin's Q as a market-based measure of firm value, thereby providing insight into how investors perceive intellectual capital investments.

Second, the study provides a more comprehensive assessment of intellectual capital by incorporating human capital efficiency, structural capital efficiency, capital employed efficiency, and relational capital efficiency within a single framework. This addresses limitations in prior studies that examined only selected dimensions of intellectual capital.

Third, the study contributes sector-specific evidence by focusing exclusively on Nigerian listed consumer goods firms, a sector where brand reputation, customer relationships, employee expertise, and operational capabilities are important drivers of competitiveness and value creation.

Finally, the study provides updated evidence covering the period 2015–2025, thereby extending existing empirical knowledge and offering useful insights for corporate managers, investors, regulators, and policymakers regarding the strategic importance of intellectual capital in enhancing firm value.

Limitations of the Study

This study is limited by its purposive sampling technique, which restricted the sample to 15 listed consumer goods firms with available and consistent financial data, thereby limiting the generalizability of the findings. In addition, the study relied on secondary data from annual reports and used proxy measures for intellectual capital components, particularly relational capital efficiency, which may not fully capture the intangible nature of these resources. Future studies may consider broader samples, primary data approaches, and alternative measurement techniques to provide further insights into the relationship between intellectual capital and firm value.

REFERENCES

Abubakar, H. S., Fodio, M. I., & Ibrahim, H. (2019). Effect of structural capital on performance of listed consumer goods companies in Nigeria. *The Chartered Institute of Taxation of Nigeria Journal of Taxation and Economic Development, 18*(1), 122–156.

Akintola, G. C., & Adedayo, S. O. (2022). Corporate governance and financial performance: The impact of intellectual capital in Nigeria's consumer goods sector. *Humanities*

Research and Development Journal, 10(1), 20–41.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Dharmakeerthi, M. M. K. S., & Ranjani, R. P. C. (2022). The impact of intellectual capital on firm value: A comparative study of consumer services companies and capital goods companies listed in CSE. *Journal of Accountancy and Finance, 9*(1).

Edet, J. P., Ebe, J. S., Udontah, E. I., & Umoren, A. O. (2023). Intellectual capital and firm value of quoted consumer goods companies in Nigeria: Evidence from post-adoption period of IFRSs. *Management, 4*(1), 144–166.

Eneh, O. M., Anyahara, I. O., Anaege, A. E., & Inweregbu, O. A. (2025). Human capital investment and performance of quoted manufacturing companies in Nigeria. *International Journal of Research and Innovation in Social Science, 9*(3s), 3613–3626.

Enekwe, C. I., Udeh, S. N., & Okwo, I. M. (2022). Effect of intellectual capital on financial performance of listed consumer goods companies in Nigeria. *European Journal of Accounting, Finance and Investment, 8*(6), 10–26.

Ezeilo, F. I. & Ike, R.C. (2024). Environmental scanning and performance of pharmaceutical firms in Nigeria. *Admiralty Journal of Multidisciplinary Research*. 1(1), 1-15. https://ajmr.com.ng/index.php/ajmr/article/view/2

Ike, R. C., & Ezeilo, F. I. (2025). Effect of financial reporting standards in enhancing transparency and accountability of energy firms in Nigeria. *African Journal of Accounting and Financial Research (AJAFR), 8*(4), 17–34.

Korolo, E. O. (2025). The nexus between human resource accounting and financial performance: Evidence from quoted insurance companies in Nigeria. *African Journal of Accounting and Financial Research, 8*(4), 128–149.

Lawal, T., Lawal, L. O., Shitu, A. M., & Muhammad, Y. (2024). Corporate board structure and human capital disclosure of listed non-financial services firms in Nigeria. *Fuoye Journal of Accounting and Management, 7*(2).

Liuraman, Z., Patience, A., & Ikpe, E. O. (2021). Intellectual capital, assets management and financial performance of listed consumer goods companies in Nigeria. *Kashere Journal of Accounting and Finance, 1*(1), 169–184.

Nkechi, O. T., & Nath, O. O. (2022). Intellectual capital and corporate performance of quoted consumer goods manufacturing companies in Nigeria. *Asian Journal of Economics, Business and Accounting, 22*(3), 28–51.

Odat, M., & Bsoul, R. (2022). The role of intellectual capital in firms' performance and market value: Evidence from Jordan. *International Journal of Management and Sustainability, 11*(4), 258–272.

Okoye, P. C., Fahmi, F. M., & Ali, M. M. (2024). Intellectual capital efficiency on corporate value creation: Evidence

from quoted industrial and consumer goods manufacturing firms in Nigeria. *ASEAN Entrepreneurship Journal, 10*(3), 94–108.

Okpe, A. J., Emmanuel, D., & Blessing, E. (2023). Intellectual capital and financial performance of listed non-financial companies in Nigeria. *Journal of Research in Business and Management, 11*(3), 131–147.

Olohunlana, A. O., Odeleye, A. T., & Isola, W. A. (2022). Intellectual capital and financial performance of consumer goods listed firms in Nigeria. *International Journal of Contemporary Accounting Issues–IJCAI (formerly International Journal of Accounting & Finance IJAF), 11*(1), 94–110.

Shuaibu, K., Ali, I., & Amin, I. M. (2019). Company attributes and firm value of listed consumer goods companies in Nigeria. *Journal of Research in Humanities and Social Science, 7*(5), 40–49.

Sylvester, U. E., Abubakar, M. Y., & Abubakar, M. (2025). Integrated reporting and firm value: Evidence from listed consumer goods firms in Nigeria. *Finance & Economics Review, 7*(1), 124–141.

Tonye, O., & Oruh, O. (2022). Intellectual capital efficiency and economic value of consumer goods firms in Nigeria. *BW Academic Journal, 1*(1), 9–19.

Uwhejevwe-Togbolo, S. E., Okwoma, A. A., Ubogu, F. E., Efanimjor, P., & Olise, J. (2025). Impact of intellectual and natural capital on financial performance of listed consumers goods firms in Nigeria. *International Journal of Accounting, Business, and Economic Policy, 1*(3), 145–160.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal, 5*(2), 171–180. https://doi.org/10.1002/smj.4250050207