

EXAMINING THE MEDIATING ROLE OF FIRM CHARACTERISTICS IN THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL EFFICIENCY AND FIRM PERFORMANCE: A COMPARATIVE STUDY OF IT AND HEALTHCARE LISTED FIRMS IN INDIA

Anandi Sarkar Pyne*, Mitra Goswami**

Abstract *The growing importance of Intellectual Capital (IC) highlights the transition from a traditional to a knowledge-based economy. The research question is whether the relationship between ICE and FP differs between India's Information Technology (IT) and Healthcare sectors. Additionally, it examines whether firm characteristics have a mediating effect on this relationship. The data spanning from 2008 to 2024 for 37 IT firms and 69 Healthcare firms listed on the Bombay Stock Exchange (BSE) are analysed. The study explores the mediating effects of firm characteristics on the influence of IC on Return on Total Assets (ROTA) and assesses sectoral variations in this effect. Results indicate a sector-specific dynamic, while IC significantly influences ROTA in IT firms, its impact is less pronounced in healthcare firms. Furthermore, the mediating role of firm characteristics, such as firm size, differs between the two sectors. However, firm size consistently mediates the effect of IC on FP in both sectors, providing a common ground. These findings contribute to the literature by highlighting the sector-specific relevance of IC and its management. The study offers actionable insights for managers seeking to optimise FP through strategic IC utilisation in the evolving knowledge economy.*

Keywords *Intellectual Capital (IC), VAIC™, GLM Mediation Effect, Return on Total Assets (ROTA)*

INTRODUCTION

The transition from a traditional, tangible asset-intensive economy to a modern, knowledge-intensive economy fundamentally transformed the landscape of value creation and competitive advantage. In the past, firms primarily relied on tangible assets (like, property, plant and equipment) to drive performance and achieve competitive success. However, as the world economy has increasingly shifted towards a knowledge-intensive model, the emphasis has moved towards intangible assets, particularly Intellectual Capital (IC), as crucial drivers of FP (Carson et al., 2004; Cabrita et al., 2007).

IC encompasses three main components: CE, Structural Capital (SC) and Human Capital (HC). HC refers to the knowledge, skills and competencies of a firm's employees. SC includes the organisational processes, databases and intellectual property that support operational efficiency. CE, often considered a subset of SC, represents the financial resources utilised in generating value. Each component

plays a distinct role in influencing FP, and understanding which element has the most significant impact is crucial for effective strategic management (Stewart, 2007; Shaban et al., 2013).

The primary objective of this study is three-fold. Firstly, to determine the mediating effect of firm characteristics between IC and FP. Secondly, whether the IC exerts any influence over FP. Thirdly, comparative analysis between the results of the findings of the first two objectives with respect to IT and Healthcare Sectors. This is essential for firms to create strategies that offer the greatest potential for value creation and competitive advantage.

This research focuses on the Information Technology (IT) and Healthcare sectors, specifically examining firms listed in BSE in India. These sectors are particularly relevant due to their high reliance on knowledge and innovation, making them ideal candidates for studying the effect of IC on financial performance (FP). The IT sector, known for its rapid technological advancements and innovation, and the Healthcare sector, with its emphasis on cutting-edge research

* Assistant Professor, Amity College of Commerce and Finance, Amity University, Kolkata, West Bengal, India.
Email: aspyne@kol.amity.edu

** Assistant Professor, Department of Commerce, Faculty of Commerce & Management, St. Xavier's University, Kolkata, West Bengal, India. Email: mitra.goswami@sxuk.edu.in

and development, both provide rich contexts for exploring the role of IC (Alfiero et al., 2021; Tiwari, 2022).

India's dynamic economic environment, characterised by a growing shift towards a knowledge-based economy, offers a unique setting for this study. The Indian market, with its diverse range of IT and Healthcare firms, presents an opportunity to investigate how IC influences performance within an emerging economy. Understanding the effect of intellectual assets of these firms and whether firm size and leverage moderate this relationship can provide valuable insights for managers, investors and policymakers (Akorede et al., 2024).

The study employs Pulic's VAICTM model to evaluate the impact of IC on FP. The VAICTM model offers a quantifiable measure of how effectively firms manage their intellectual assets to create value. Return on Total assets (ROTA) is used as the primary performance metric, as investors' look for this indicator while investing in a firm (Kumari et al., 2024).

The research will address the research questions, like, whether sector wise the IC dynamics differs or not. Whether firm characteristics has mediating effect on the influence of IC on FP and if exists, then whether both the sectors enjoy the same effect.

By exploring these questions, the objective of the research is to add to the existing literature on IC and FP, offering empirical evidence on the relative need of IC on FP and the effects of organisational characteristics on this relationship. The results of the study will provide practical insights for firms seeking to enhance their performance through strategic management of intellectual assets.

This research seeks to clarify the effect of IC on FP for knowledge-based sectors and to explore how firm age, size and leverage influence this relationship. Through a detailed analysis of the IT and Healthcare sectors in India, the research aims to provide valuable contributions to the field of strategic management, offering actionable insights for firms navigating the complexities of the knowledge-based economy.

Relevance of IC

The research is an attempt to understand the effects of Efficiency of IC on FP. Financial data in an annual report reflects a business's past performance, not its future potential. Future potential of a firm relies on IC. Also, the growing focus of firms on intangible assets, such as skilled labour and other intangibles like, know-how and patents aids to acquire a competitive edge and create value, is driving up demand for external communication of IC. This has led to an increasing recognition of IC as a crucial component of

value-creating processes within businesses. In fact, there has been an increase in the information availability in a variety of reporting sources (Rieg & Vanini, 2023). Further IC aids in assessing strategy execution, aiding diversification decisions, formulating strategy, expansion decisions and providing a basis for compensation and communicating measures to external stakeholders. However, firms may choose not to disclose IC externally due to risks like losing their advantages, legal implications and measurement costs.

In the Indian scenario, many firms, particularly in knowledge-intensive industries, are yet to recognise the significance of the IC. ICs are the intangible assets held by companies (Maulana & Mediawati, 2022). Furthermore, IC can be used as an instrument to detect the intangible resources both for tangible and intangible data (Guthrie, 2001). By providing information on firm IC, the firm enhances the understanding of its strategic direction, innovation capabilities and ability to adapt in an ever-changing business environment. One of the significant components of ICE is Human Capital Efficiency (HCE) which also enables stakeholders to evaluate the effectiveness of a company's human resource management practices, such as training and development initiatives, talent retention strategies and performance evaluation systems. This information is valuable for investors, as it can help them assess the long-term sustainability and competitive advantage of a company (Nicolò et al., 2021; Salvi et al., 2022).

Companies differentiate themselves from competitors and attract investors who value the Importance of intangible assets in driving a company's success (Eneh et al., 2021). Intellectual Capital Efficiency (ICE) is now seen as a crucial strategic requirement for companies to convey their intangible assets in an efficient manner and attract investors who recognise the effect of these assets on FP.

The vast review on literature on IC provides a clear insight into the theoretical background of the concept. While reviewing literature on the effect of ICE on FP of listed IT and Healthcare companies, we found that research on IC and FP is growing day-by-day, but the researcher failed to find work on comparative analysis between knowledge-based sectors, IT and healthcare, mediating effect of firm size and leverage on the relationship between IC and FP. The paper determines the mediating effect of firm characteristics on the effect of IC on ROTA. Additionally, the paper can provide an insight into the fact that whether higher IC is resulting in higher ROTA or not.

Conceptual Framework

IC has become an indispensable asset for boosting a company's competitiveness and creating value in the

modern knowledge-based economy. Firms that effectively manage and disclose their IC stand a better chance of attracting investors and creating sustainable value in the long run. The research incorporates four different theories to elucidate the concept of IC: stakeholder, signalling, agency and legitimising theories.

Stakeholder theory recognises various stakeholders, making it evident that larger companies tend to emphasise IC more. Legitimacy theory suggests that companies continuously seek approval from society regarding their functions. There's a good probability that a firm may face consequences if it operates outside of socially acceptable bounds and rules. On the other hand, Signaling Theory posits that high-performing companies should demonstrate their high profitability and reduced costs for investors. Agency theory provides power in the hands of shareholders and the executives of the company work as agents on behalf of the shareholders.

Firms that effectively manage their IC stand a better chance of attracting investors and creating sustainable value in the long run. Exposing information about market share, supplier knowledge, competitive advantages, management philosophy and processes can provide reassurance to the stakeholders. Not only can IC and other discretionary information increase confidence in the agent's ability to effectively manage available resources but it aligns with the theory that suggests high-leverage companies would divulge further facts to mitigate risk for debenture holders while simultaneously reducing capital costs and uncertainty for investors (Nurunnabi et al., 2011). Therefore, a greater level of IC can reduce agency costs. (Widiatmoko & Indarti, 2017).

Figure 1 shows the effect of ICE on FP and the mediating effect of Firm Characteristics (FC). Majorly, the model constitutes three attributes, namely, IC, FC and FP. IC is a significant strategic asset that contributes to the checklist of critical success factors of a firm both in developed and developing economies (Debnath et al., 2023). Through the application of the VAIC model, this research delineates HC, SC and CE as the primary components of IC (Pulic, 2000). FC is another attribute which includes firm age, firm size and leverage as the significant sub-indicators which may mediate the relationship between the other two attributes IC and FP. FP is measured using profitability (ROTA) of a firm. Thus, conceptual model of the research is framed based on past studies and the research gap found on the relationship between the IC and FP.

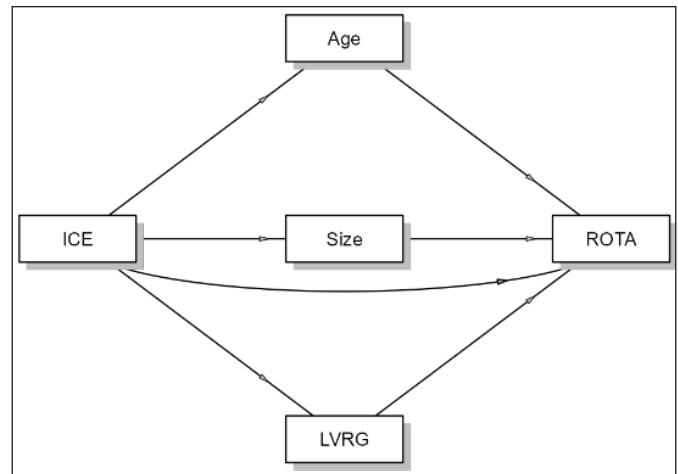


Fig. 1: Conceptual Model

LITERATURE REVIEW

The literature review is organised into three distinct sections. Section I specifically focuses on the relationship between IC and FP in the Indian IT sector. Section II, on the other hand, explores this relationship within the Indian Healthcare sector.

IC and FP of IT Based Listed Companies in India

Given its knowledge-intensive nature, the IT sector, both globally and domestically, relies heavily on IC. A substantial body of existing research supports the notion of a positive association between IC and FP (Maji, 2016; Bansal, 2020; Khan, 2018; Pyne, 2024). Organisations with high levels of HC, characterised by skilled, motivated and committed employees, tend to outperform their competitors. Also, the SC provides the infrastructure necessary to create and disseminate knowledge (Edvinsson & Malone, 1997).

IC and FP of Healthcare Based Listed Companies in India

IC has been widely recognised as an asset for organisations across various industries. In the healthcare sector, IC plays a crucial role in improving patient care, attracting and retaining top talent and driving innovation. More broadly, IC is essential for enhancing operational efficiency in healthcare organisations. By leveraging their intellectual

resources effectively, healthcare organisations can streamline processes, reduce costs and improve overall performance (Al-Omouh et al., 2022). Furthermore, studies attempting comparative sectorial analysis found that IC does not affect profitability of the healthcare sector (Sekhar, 2009). However, some other studies suggest a positive effect of ICE on FP.

The role of IC is undeniable in Indian Healthcare sector due to its unique dynamics. Various studies indicate that those healthcare providers and hospitals that prioritise HC development tend to achieve superior FP (Kengatharan, 2019). Additionally, the role of SC in enhancing patient care and streamlining operations is evidently important. Studies show that increased patient satisfaction correlates with efficient processes and FP (Kamath, 2008; Edvinsson & Malone, 1997).

While past research emphasised either healthcare or IT sectors individually, comparative study between these knowledge-based sectors in the context of BSE listed companies in India are limited. Also, comparative studies upon the mediating effect of firm characteristics between IC and FP is limited.

Addressing these gaps could enhance the understanding of the influence of IC upon FP across diverse knowledge-based sectors in India despite evolving challenges in the IT and healthcare landscapes.

RESEARCH METHODOLOGY

The study deals with empirical investigation of the relationship between IC and FP for knowledge-based sectors like IT and healthcare sectors. Multiple regression model is used to assess the relationship sector-wise. Here, IC is based on VAICTM model and FP is measured using profitability of the firm attributed by ROTA. The data is collected from BSE with 44 IT and 69 healthcare sector firms for the period of 2008 to 2024. The study used GLM mediation model to analyse the panel data collected from annual reports of these listed companies to understand the mediating effect. Bootstrap method is used to derive the direct and indirect effects of the variables upon the profitability of the company. Further, the path analysis of the GLM model suggests the β factor which signifies the degree to which the FP changes due to ICE and indirectly mediated by Age, Size and LVRG.

Hypothesis Formulation

Our study is framed on the concept of the mediating effect of firm characteristics on the relationship between IC based on VAIC model developed by Pulic. As per the model the IC is defined by ICE whose determinants are Human Capital

Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE), each of these are researched which contributes to FP in different ways. The hypothesis is framed based on the research question that whether sector difference affects the mediating influence of FC on the relationship between IC and FP.

H1: Firm characteristics do not mediate the relationship between ICE and FP of IT-based listed companies in India.

H1a: Firm age do not mediate the relationship between ICE and FP of IT-based listed companies in India.

H1b: Firm age do not mediate the relationship between ICE and FP of IT-based listed companies in India.

H1c: Firm Leverage do not mediate the relationship between ICE and FP of IT-based listed companies in India.

The second hypothesis deals with the mediating effect of firm characteristics in the relationship between ICE and FP of IT based and Healthcare based listed knowledge-based economy. The comparative study of the effect of firm age and leverage on the relationship between the two for the two different kinds of sector would be interesting.

H2: No mediating effect exist for firm characteristics upon the relationship between ICE and FP of healthcare based listed companies in India.

H2a: No mediating effect exist for firm age upon the relationship between ICE and FP of healthcare based listed companies in India.

H2b: No mediating effect exist for firm size upon the relationship between ICE and FP of healthcare based listed companies in India.

H2c: No mediating effect exist for firm leverage upon the relationship between ICE and FP of healthcare based listed companies in India.

Further to understand whether IC effects FP for both the knowledge-based sector the following hypothesis were framed:

H3: The Intellectual Capital do not significantly effects FP for IT based companies in India.

H4: The Intellectual Capital do not significantly effects FP for healthcare companies in India.

Data Collection

We collected the data from CMIE prowess for the period of 2008-2024. To collect the data we selected BSE, as this stock exchange is the oldest stock exchange in comparison to others. Further, we selected all the companies available in sector specific index i.e. S & P BSE IT Index and S & P BSE Healthcare Index.

Variables

In this study, FP is the dependent variable, while IC is the independent variable. Firm age, size and leverage serve as moderating variables. ICE is calculated using the Value-Added Intellectual Coefficient (VAIC) model. As per Pulic's definition, IC is assessed based on its value-creation potential. ICE is the sum of Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE). HCE is calculated by dividing Value Added (VA) by HC. SCE is calculated by dividing SC by VA. CEE is calculated by dividing CE by VA. VA is the difference between operating profit and expenses such as employee costs, depreciation and amortization. HC is defined by salaries, wages and other employee-related expenditures. SC is the difference between VA and HC. CE is the difference between total assets (TA) and current liabilities. Firm size is measured as the natural logarithm of TA.

RESULTS AND ANALYSIS

To check the robustness of the model Cronbach α test is conducted to measure reliability and Variance Inflation Factor (VIF) test is performed to analyse multi-collinearity of the data.

As per Table 1 all the VIF is less than 3. Thus, we can state that in the given set of data for both the sectors, healthcare and IT sectors no multi-collinearity exists.

Table 1: Variance Inflation Factor Test

	Healthcare	IT
Variable	VIF	VIF
HCE	1.01	10.2
SCE	1.09	1.11
CEE	1	1.01
Size	1.26	1.34
Leverage	1.27	1.32
Age	1.1	1.15

Table 2 indicates Cronbach α test is used to test the reliability of the data and the result suggests (Cronbach $\alpha > 0.7$) that the data is reliable enough to conduct further analysis.

Table 2: Scale Reliability Statistics

Cronbach's α
0.750

To test the hypothesis GLM Mediation model is used to analyse the mediation effect between FP and ICE for both the sectors, healthcare and IT, as the data is non-normal this model is appropriate for analysis.

GLM Mediation Model – IT Based Listed Indian Firms

Table 3: Model Information

Models Information		
Mediators Models	m1	Age ~ ICE
	m2	Size ~ ICE
	m3	LVRG ~ ICE
Full Model	m4	ROTA ~ Age + Size + LVRG + ICE
Indirect Effects	IE 1	ICE \Rightarrow Age \Rightarrow ROTA
	IE 2	ICE \Rightarrow Size \Rightarrow ROTA
	IE 3	ICE \Rightarrow LVRG \Rightarrow ROTA
Sample Size	N	592

Path Model

Statistical Diagram

The statistical path analysis (Fig. 2) upon the given data suggests that ICE enjoys an inverse relationship between leverage and age and direct relationship with size. Thus, as the firm size increases the ICE also increases. Interestingly, leverage (LVRG) and firm age (Age) enjoys inverse relation with ROTA and size enjoys the direct relation with the profitability of the firm (ROTA). We can infer that increase in size of the firm results into 0.45 increases in the profitability of the IT based firms in India.

However, Table 4 shows the analysis for the hypothesis (H1), which claims that the mediating effect of firm characteristics on the relationship between ICE and FP of IT based listed companies in India, does not exist. The null hypotheses H1a and H1c cannot be rejected (p -values of 0.880 and 0.860, respectively, are greater than 0.05). This indicates that firm age and leverage do not significantly mediate the relationship between ICE and FP. However, the null hypothesis H1b is rejected (p value (0.011) < 0.05). Thus, firm size positively and significantly mediates the relationship between ICE and FP. Further noted that β is 0.23 which signifies one unit increment in firm age mildly influences (0.23) the firm age positively, and vice versa. However, higher debt has a negative influence on firm size. Also, the increase in one unit innovativeness in ICE results in a mild increase (0.11) in the size of the firm.

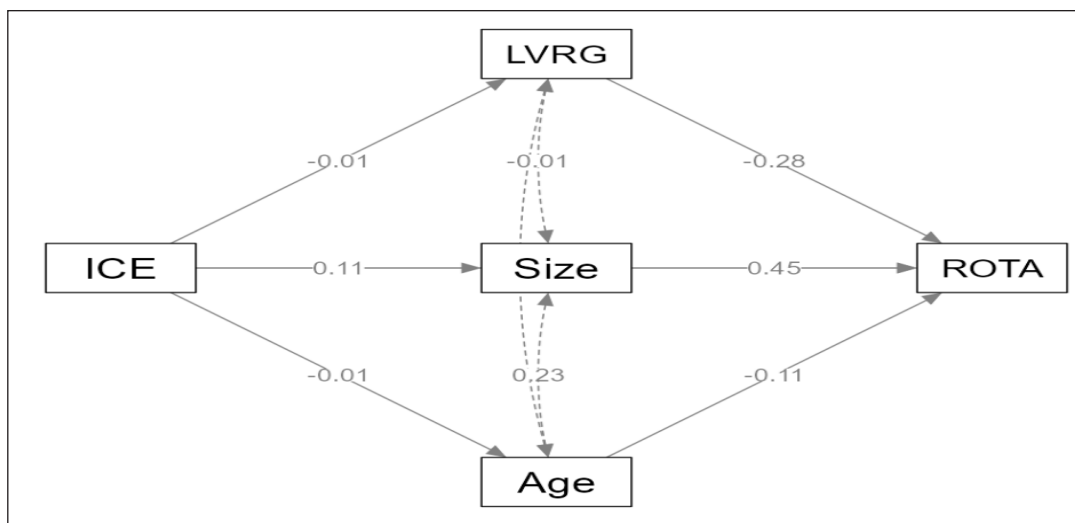


Fig. 2: Mediating Effect of FC with ICE and FP of IT Based Companies

Mediation

Table 4: Direct, Indirect and Total Effects of ICE, FC and FP

Indirect and Total Effects								
Type	Effect	Estimate	SE	95% C.I. (a)		B	z	p
				Lower	Upper			
Indirect	IE1	0.0020	0.01320	-0.01234	0.01757	6.92e-4	0.151	0.880
	IE2	0.1368	0.05404	0.05652	0.27083	0.04734	2.531	0.011
	IE3	0.0058	0.03307	-0.06409	0.05498	0.00202	0.177	0.860
Component	ICE ⇒ Age	-0.022	0.14428	-0.15761	0.14309	-0.00623	-0.152	0.880
	Age ⇒ ROTA	-0.091	0.02803	-0.13814	-0.04360	-0.11107	-3.262	0.001
	ICE ⇒ Size	0.0527	0.02044	0.02291	0.10330	0.10543	2.580	0.010
	Size ⇒ ROTA	2.5937	0.19734	2.24745	2.93540	0.44900	13.144	<.001
	ICE ⇒ LVRG	-1.96e-4	0.00111	-0.00194	0.00195	-0.00726	-0.177	0.860
	LVRG ⇒ ROTA	-29.710	3.53410	-36.90989	-20.65020	-0.27837	-8.407	<.001
Direct	ICE ⇒ ROTA	0.71704	0.09603	0.32497	1.31913	0.24815	7.467	<.001
Total	ICE ⇒ ROTA	0.86166	0.11345	0.41586	1.51188	0.29820	7.595	<.001

GLM Mediation Model- Healthcare Based Listed Indian Firms

Table 5: Model Information

Models Info		
Mediators Models	M3	Age ~ ICE
	M4	Size ~ ICE
	M5	LVRG ~ ICE
Full Model	M6	ROTA ~ Age + Size + LVRG + ICE
Indirect Effects	IE 3	ICE ⇒ Age ⇒ ROTA
	IE 4	ICE ⇒ Size ⇒ ROTA

Models Info		
	IE 5	ICE ⇒ LVRG ⇒ ROTA
Sample Size	N	1104

Path Model

Statistical Diagram

The path model (Fig. 3) signifies that ICE mildly affects firm size and firm age of the Indian healthcare sector. However, ICE and leverage enjoys an inverse relationship with each other, the increase in ICE leads to deterioration in debt of the firm.

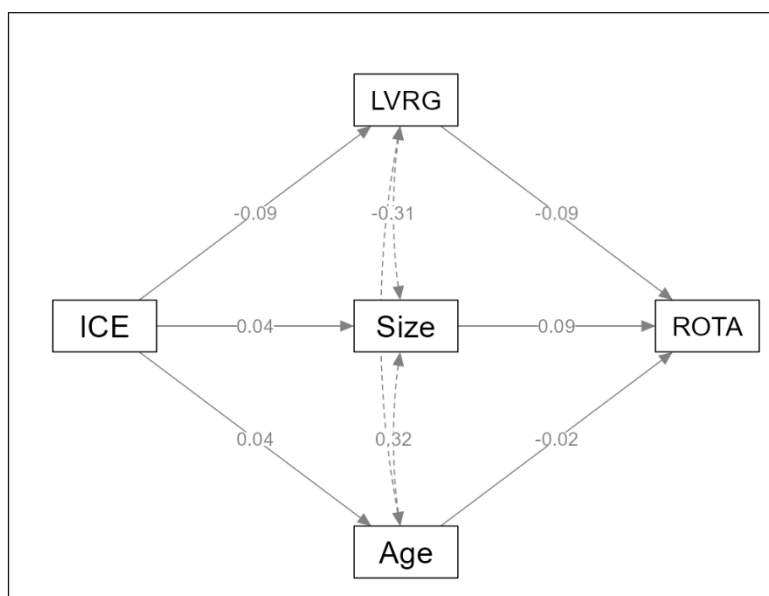


Fig. 3: Mediating Effect of FC with ICE and FP of Healthcare Based Companies

Mediation

Table 6: Mediating Effect of FC with ICE and FP

Indirect and Total Effects								
Type	Effect	Estimate	SE	95% C.I. (a)		β	z	p
				Lower	Upper			
Indirect	IE3	-3.04e-10	0.00	-1.43e-9	4.52e-10	-7.33e-4	0.00	0.00
	IE4	1.49e-9	0.00	-8.90e-10	3.08e-9	0.00360	0.00	0.00
	IE5	3.63e-9	0.00	-7.18e-9	4.92e-9	0.00875	0.00	0.00
Component	ICE \Rightarrow Age	4.48e-8	0.00	1.87e-8	6.85e-8	0.03589	0.00	0.00
	Age \Rightarrow ROTA	-0.00678	0.00	-0.0349	0.0168	-0.02042	0.00	0.00
	ICE \Rightarrow Size	4.78e-9	0.00	4.11e-9	6.90e-9	0.04083	0.00	0.00
	Size \Rightarrow ROTA	0.31225	0.00	-0.1693	0.4467	0.08810	0.00	0.00
	ICE \Rightarrow LVRG	-2.44e-8	0.00	-2.91e-8	3.67e-8	-0.09300	0.00	0.00
	LVRG \Rightarrow ROTA	-0.14872	0.00	-0.1998	-0.0722	-0.09406	0.00	0.00
Direct	ICE \Rightarrow ROTA	-7.37e-9	0.00	-7.71e-9	-3.62e-9	-0.01776	0.00	0.00
Total	ICE \Rightarrow ROTA	-2.55e-9	0.00	-1.72e-8	2.25e-9	-0.00615	0.00	0.00

The sub hypothesis of H2, H2a, H2b and H2c states that firm age, firm size and leverage mediates ICE and FP respectively. Since, p value is 0.00 (p value $<$ 0.05) for all IE3, IE4 and IE5, the null hypothesis cannot be accepted (Table 6). We can state that all the firm characteristics (age, size and leverage) mediate the relationship between ICE and FP. Notably, the LVRG and Age inversely affects FP (Fig. 4).

Sector is a vital factor to be considered for understanding the relationship between these variables. Tables 4 and 6 clearly indicate that the mediating effect of firm characteristics

upon the influence of IC on FP differs as per the sector. The firm age and leverage do not significantly mediate the IC and FP relationship of IT based listed companies in India. Only firm size significantly and positively mediates the relationship. However, in case of healthcare sector, all the firm characteristics (age, leverage and size) mediate the relationship between IC and FP.

Furthermore, to understand the difference of effect of IC and FP sector wise multiple regression models is used. Based on the regression model we found that the hypothesis H3 cannot

be accepted as the p value is less than 0.05, this signifies that IC affects the profitability of the firm for the IT based companies, supporting the existing literature. However, H4 is accepted. Thus, the research fails to find any significant relationship between IC and profitability of the Healthcare based companies as p value is more than 0.05.

Also, as per the data extracted, healthcare sector invests heavily in IC but relatively the profitability of the sector is lower than the ROTA of IT sector whose investment in IC is lower than healthcare sector. Also, the investment in HC is higher in healthcare sector relative to IT sector.

CONCLUSION

A study of Knowledge-Based Sectors like IT and HealthCare Listed Indian Companies investigates whether there are mediating effects of firm characteristics. This study examines the significance of IC in the Indian IT and healthcare sectors, focusing on its impact on FP and the mediating role of firm characteristics. Research shows that IC is crucial to increasing profitability for IT sector. However, the study fails to support the statement for healthcare sector.

Healthcare companies exhibit a higher level of ICE than the listed companies of IT. The reason for this disparity can be attributed to rapid technological innovation, the need to develop HC and the inherent knowledge-intensive nature of the Healthcare industry. Also, a robust framework for managing intellectual assets is essential to the success of the IT sector (Tiwari, 2022) as we found that ICE influences the FP of IT based listed companies. While healthcare firms admits the pivotal role of ICE, but their performance is significantly influenced by regulatory restrictions and operational efficiencies particular to this industry. Healthcare organisations face unique challenges that may restrict their ability to leverage IC as effectively as IT organisations (Akorede et al., 2022).

The results demonstrate that firm size plays a significant mediating role in the link between IC and performance for both knowledge-intensive sectors. Larger firms typically possess greater resources, enabling them to harness their intellectual assets more effectively, thereby enhancing performance. Conversely, the study found that firm age and leverage could not establish any mediating role in the relationship between ICE and FP of IT based companies, but firm age, size and leverage mediates the relationship for healthcare sector. This nuanced understanding underscores the need for tailored strategies that consider sector-specific dynamics and firm characteristics when managing IC.

For practitioners in both sectors, these findings underscore the importance of strategically managing IC to drive

FP. Organisations should prioritise recognising firm characteristics like age, size, leverage and sector to influence IC management that can help leaders tailor strategies that align with their operational contexts. For instance, smaller firms may benefit from forming strategic alliances to bolster their IC without overextending their financial resources.

India is progressing towards a knowledge intensive economy, understanding the dynamics of IC has become inevitable for companies seeking sustainable growth. This study not only provides empirical evidence upon mediating role of firm characteristics but also sector specific difference in the dynamics of the relationship between IC and FP, providing actionable insights for firms striving to optimise their performance through effective management of IC. Future research could expand upon these findings by investigating longitudinal impacts of IC management practices across diverse industries or examining how external factors such as market conditions influence these relationships, thereby enriching our understanding the role of IC in organisational success within emerging economies like India.

REFERENCES

- Al-Omouh, K. S., Palacios-Marqués, D., & Ulrich, K. (2022). The impact of intellectual capital on supply chain agility and collaborative knowledge creation in responding to unprecedented pandemic crises. *Technological Forecasting and Social Change*, 178, 121603.
- Akorede, H. (2024). The mediating effect of age and debt on the relationship between intellectual capital and FP: A developing country perspective. *Journal of African Business*, 25(2), 181-204.
- Alfiero, S., Brescia, V., & Bert, F. (2021). Intellectual capital-based performance improvement: A study in healthcare sector. *BMC Health Services Research*, 21, 1-15.
- Bansal, D., & Singh, S. (2020). Impact of intellectual capital on financial performance of the Indian software sector. *Asia-Pacific Management Accounting Journal (APMAJ)*, 15(1), 68-95.
- Cabrita, M. D. R., De Vaz, J. L., & Bontis, N. (2007). Modelling the creation of value from intellectual capital: A Portuguese banking perspective. *International Journal of Knowledge and Learning*, 3(2-3), 266-280.
- Carson, E., Ranzijn, R., Winefield, A., & Marsden, H. (2004). Intellectual capital: Mapping employee and work group attributes. *Journal of Intellectual Capital*, 5(3), 443-463.
- Debnath, P., Dey, B. K., Dey, M., Gachu, H., Lachan, B., & Shome, M. K. (2023). Intellectual capital and FP in India after the companies act, 2013: A study of selected BSE-listed firms. *Journal of Social Economics Research*, 10(3), 108-123.

- Edvinsson, L., & Malone, M. S. (1997). Intellectual capital: Realizing your company's true value by finding its hidden roots. *Harper Business*.
- Gupta, J., Rathore, P., & Kashiramka, S. (2023). Impact of intellectual capital on the financial performance of innovation-driven pharmaceutical firms: Empirical evidence from India. *Journal of the Knowledge Economy*, 14(2), 1052-1076.
- Hayton, J. C. (2005). Competing in the new economy: The effect of intellectual capital on corporate entrepreneurship in high-technology new ventures. *R&D Management*, 35(2), 137-155.
- Kengatharan, N. (2019). A knowledge-based theory of the firm: Nexus of intellectual capital, productivity and firms' performance. *International Journal of Manpower*, 40(6), 1056-1074.
- Khan, A. M. (2018). An empirical study of the impact of intellectual capital on the financial performance of the Indian IT sector. *Корпоративные финансы*, 12(1), 7-19.
- Kumari, R., Chaudhuri, T. D., & Ghosh, I. (2024). Tobin's q and FP: MCDM and clustering-based approach for Indian companies. *International Journal of Business Information Systems*, 45(4), 564-590.
- Maji, S. G., & Goswami, M. (2016). Intellectual capital and FP in emerging economies: The case of India. *Review of International Business and Strategy*, 26(3), 410-430.
- Pulic, A. (2000). VAIC™ - An accounting tool for IC management. *International Journal of Technology Management*, 20(5-8), 702-714. doi:<https://doi.org/10.1504/IJTM.2000.002891>
- Pyne, A. S., & Goswami, M. (2024). Impact of intellectual capital components and firm characteristics on corporate performance: A case of IT-based listed companies in India. *IOSR Journal of Business and Management*, 26(9), 25-33. doi:<https://doi.org/10.9790/487X-2609112533>
- Sekhar, C., Patwardhan, M., & Vyas, V. (2017). Causal modelling of HR flexibility and FP in Indian IT industries. *Journal of Modelling in Management*, 12(4), 631-651.
- Shaban, M., & Kavida, V. (2013). Intellectual capital, financial performance and market valuation: An empirical investigation of information technology industry in India. *Asia-Pacific Journal of Management Research and Innovation*, 9(1), 55-62.
- Stewart, T. A. (2007). *The wealth of knowledge: Intellectual capital and the twenty-first century organization*. Crown Currency.
- Tiwari, R. (2022). Nexus between intellectual capital and profitability with interaction effects: Panel data evidence from the Indian healthcare industry. *Journal of Intellectual Capital*, 23(3), 588-616.
- Vishnu, S., & Gupta, V. K. (2015). Performance of intellectual capital in Indian healthcare sector. *International Journal of Learning and Intellectual Capital* 2, 12(1), 47-60.