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Assessing Intellectual Capital Efficiency of Indian Banks: A Comparative Study of Public and Private Sector Banks

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ABSTRACT

The importance of Intellectual Capital has grown as knowledge-based, dynamic, and technologically upgraded businesses have expanded throughout the global world. Intellectual Capital is considered as a major asset for many organizations today. An optimum use of intellectual capital can add to competitive strength of an organization. Banking sector is regarded as a knowledge-intensive industry therefore it is crucial for banking industry to effectively utilize its intellectual capital so that value can be created. The current study aims to analyse the intellectual capital performance of Indian banks in general and make a comparative analysis of the variations in the intellectual capital performance among public and private sector banks in India in particular. Data has been gathered for Top 10 public and private sector banks according to market capitalization and analysed using Value Added Intellectual Capital Methodology developed by Pulic (1998) for a period of 5 years spanning from 2018-2022. The results of the study confirmed that a wide variation exists in intellectual capital performance among Indian banks. Private sector banks exhibited a better performance as compared to public sector banks.

Keywords-- Intellectual Capital, Knowledge Management, Value Added Intellectual Coefficient (VAIC)

I. INTRODUCTION

Over the past few years, a lot much emphasis has been placed on the concept of knowledge-based economy and knowledge intensive organizations. Such knowledge focused economy and firms are primarily driven by Intellectual Capital (IC). IC is considered as a major asset for many organizations in the global economy. Most of the organizations have prioritized intangible assets as a vital component of a sustainable business. IC serves as an organization's main source of wealth generation in this knowledge era (Ghosh & Mondal, 2009; Sen, 2013). Dynamism in the business environment has shifted the focus of the firms from physical assets to intangible assets. A firm that invests in IC is twice likely to earn greater profits as compared to firm that invests equivalent amount in physical assets. Human capital is regarded as tacit expertise that each employee brings to the organization in the form of their background, experiences, attitudes, and other personal characteristics. This leads to value creation in the organization in either of the two ways i.e. if such knowledge is used siloed or in conjunction with knowledge of other people (Singh et al., 2016).

Banking sector acts as providers of financial services as well as a financial intermediary. So, it is regarded as a knowledge intensive sector (Mavridis, 2004). It is crucial to assess how effectively banks use their intangible or intellectual assets because the performance of banks and other commercial organizations within an economy that ultimately depends on the services supplied by the banking sector, affects the economic growth of that nation (Ghosh & Mondal, 2009). After the liberalization policy of 1991, banks in India have witnessed a significant growth. The entry of the private sector in the banking industry has further intensified the competition among banks. So, this makes it a compelling case to see how Indian banks use IC to improve their competitive edge. The study also attempts to make a comparative analysis of the performance of IC in banks according to their ownership pattern i.e. public and private sector banks. Several empirical studies have been conducted on measuring the performance of IC in bank (Ghosh & Mondal, 2009; Joshi et al., 2010; Mavridis, 2004) but the literature on comparison between the performance of IC in public and private sector banks is very scant. This study contributes to the academic literature by adding a new facet to already existing research on IC performance of banks as an attempt is made to compare the performance of public and private banks in India concerning IC.

The paper is divided into following sections. Section 2 provides a review of extant literature and hence formulates the hypothesis of the study. Section 3 presents Research methodology. Section 4 presents empirical results and discussions. Section 5 presents conclusions, limitations and implications of the study.

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II. LITERATURE REVIEW

2.1 Defining IC and Delineating its Constituents

There is no consensus on the precise definition of IC. Different researchers have defined IC in their own way. Stewart (1997) defined IC as the ‘‘packaging of useful knowledge’’. Edvinsson & Malone (1997) described IC as the gap which is prevalent among firm’s market value and book value. The term IC has been interchangeably quoted in various researches as knowledge capital, intangible assets, knowledge assets, intangible resources (Bontis, 2001; Singh et al., 2016). In general terms, IC is anything that is generated from human intellect or mind (Kamath, 2007). However, Lev’s comprehensive definition of IC as being intangible sources of value creation that is derived through innovation, distinctive organizational structures or human resource practices has been widely recognized (Joshi et al., 2010).

Most popularly, IC has been divided into 3 components- Human Capital (HC), Structural Capital (SC) and Customer capital (CC) (Kujansivu, 2005; Sveiby, 1997). HC is recognized as the most important strategic resource of the organization. An organization that has superior human resources are at competitive edge and are in a better position to provide timely services to their customers. It also encompasses an organization's capacity for innovation and creativity (Ghosh & Mondal, 2009). HC constitutes employees' skills and competencies which can be further strengthened with the aid of training (Joshi et al., 2010).

SC is the knowledge that an organization creates and that cannot be detached from it (Joshi et al., 2010). It serves as supportive infrastructure that aids the human capital. In simpler words, it is the capital, which remains in the organization even when the employees depart. All intellectual resources that are used to manage and control an organization's external connections, including its ties with stakeholders, suppliers, consumers, and marketing channels, are collectively referred to as relational capital (Bontis, 2001). It contains some concepts such as goodwill, market power, customer satisfaction etc. (Joshi et al., 2010).

2.2 Theoretical Underpinnings of IC

There are many underlying theories behind growing popularity of the concept of IC. One such theory is resource-based view of the firm proposed by Wernerfelt in 1984. Organizations that possess "strategic resources" have significant competitive advantages over those that do not. According to resource-based theory, a resource is strategic if it is valuable, uncommon, challenging to duplicate, and non-replaceable. Strategic resources are generally the intangible resources such as firm’s reputation, skills of employees, culture of organization etc. as they precisely fit the characteristics of a strategic resource. Another aspect of resource-based theory is the concept of capabilities. Capabilities develop over time as an organization moves forward with strategies that build on its strategic resources.

Another underlying theory is s resource dependency theory propounded by Salancik and Pfeffer in 1978. According to this theory, in order to acquire resources, an organization should engage in transactions with its external environment. So, human capital by way of human resources is regarded as an important factor that can play a significant role in conducting such transactions.

2.3 Methodologies used to Measure IC

Researchers have developed varied methods to measure IC. These are balanced scorecard approach by Kaplan & Nortan (1996), Skandia Navigator developed by Edvinsson & Malone (1997), The Intangible Asset Monitor developed by Sveiby (1997), Intellectual Capital Services IC-Index^{TM} by Roos & Roos (1997) Value Added Intellectual Coefficient (VAIC^{TM}) is among the most popular and widely recognized methods used to measure IC. It was developed by Pulic in 1998 through which he analysed IC performance of Australian banks.

It is based on view of stakeholder perspective as it measures the efficiency with which a firm uses its intellectual capital so as to create value to its stakeholders. VAIC^{TM} Methodology is comprised of three types of efficiencies- Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE). Aggregation of HCE and SCE yields Intellectual Capital Efficiency (ICE). Table 1 presents various methodologies used by previous researchers for measuring intellectual capital.

Table 1: Methodologies used to measure IC

Author(s)	Technique	Elements
Edvinsson & Malone (1997)	Skandia Navigator	• Human Capital • Structural Capital
Kaplan & Norton (1996)	The balanced scorecard approach	• Internal processes perspective • Customer Perspective • Learning and growth perspective • Financial perspective
Sveiby (1997)	The intangible asset monitor	• Internal structure • External structure • Competence of personnel

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Roos & Roos (1997)	Intellectual Capital Services IC-Index™	• Human capital • Organizational capital • Customer and relationship capital
Pulic (1998)	Value Added Intellectual Coefficient (VAIC™)	• Human Capital Efficiency (HCE) • Structural Capital Efficiency (SCE) • Capital Employed Efficiency (CEE).

Source: Author's own compilation adapted from Brennan & Connell (2000)

2.4 Studies Linking IC and Performance of Banks

One of the very first attempts to link IC with performance of banks was made by Pulic (2004) where he measured intellectual capital performance in Australian banks from the year 1993 to 1995 using VAIC Methodology. Results of the study indicated that intellectual capital efficiency is crucial for success of the banks. Pulic (2001) studied the IC performance of Croatian banks from 1996 to 2000. Findings depicted that there were significant differences in the IC performance of Croatian banks. Mavridis (2004) studied 141 Japanese banks for the fiscal year 1 April 2000-31 March 2001 by employing VAIC Methodology. Results of the study reported significant correlation between value added and physical capital.

Similar study measuring the IC performance of Malaysian banks was conducted by Goh (2005)for the period 2001-2003 by using VAIC methodology. Results of the empirical study shows that all banks depicted high HC efficiency. Also, Foreign banks outperformed domestic Malaysian banks in terms of efficiency. (Cabrita & Vaz, 2006) investigated the interdependence of various components of IC and performance of 53 Portuguese banks and results of the study highlighted that structural and relational capital influences the relationship between HC and performance of banks. Saengchan (2007) study on Thailand's banking industry shows that there is strong relationship between efficiency of IC and banks financial performance. The research results confirmed that IC acts as a major source of corporate advantages of Thailand banks as efficiency of IC strongly associated with the profitability of banks.

Yalama & Coskun (2007) conducted a study on Turkish banking industry for the period 1995-2004 with their major focus on the impact of VAIC on profitability. The findings indicated that yearly IC performance of Turkish banks is not stable. It was also discovered that on one hand, some banks are in a better position to transfer IC value to banks' profitability but on the other hand, some banks don't consider it viable to do so. Puntillo (2009) looked at the connection between a bank's financial success and intellectual capital by studying 21 banks that are listed on the Milan Stock Exchange. This study also looked at the connection between banks' market-to-book value ratios and value generating effectiveness. The study did not discover any association between the other characteristics looked at and various metrics of bank performance, with the exception of CEE. Joshi et al. (2010) looked at the performance of 11 Australian-owned banks that accounted for more than 90% of all banking activities. In comparison to the CEE or structural capital efficiency (SCE) categories, they discovered that all banks performed better in the HCE category., Joshi et al. (2013) extended their 2010 study to the Australian banking sector and concluded that the human capital component has a considerable impact on the potential of value creation. Additionally, they discovered that the intellectual capital efficiency of the large majority of companies was quite low.

In the Indian context, Kamath (2007) concluded that global banks performed better than Indian domestic banks in terms of intellectual capital. Mondal & Ghosh (2012) examined the intellectual capital performance of Indian banks and discovered that effective use of intellectual capital was essential for banks to gain a competitive edge. They also placed a strong emphasis on the profitability and productivity of banks. They did not, however, compare the two banking sectors in Indian context. In order to examine how various banks responded to deregulation and industry reforms in terms of building their intellectual capital, Deol (2009) undertook a case study of Indian banks. They highlighted that when the strategic environment change, public sector banks reacte differently than private and international banks.

2.5 Hypotheses Development

Regardless of their sector, all banks operate in the same regulatory framework and face competition from their counterparts. Despite the fact that all banks are free to take advantage of the same opportunities, some banks earn more profits than others (Singh et al., 2016). Therefore, it is imperative to explore that whether the banks in India that are separated by ownership-public banks and private banks show any variation in performance of IC.

H1: There is a significant variation in IC performance of public and private banks in India.

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Also, this study seeks to explore that whether banks operating in same sector differ in their performance of IC because although firms operating in same sector are governed by common guidelines still they adopt varied approaches according to nature of their operations (Singh et al., 2016)

H2: There is a significant variation in intra sector performance of IC of public banks and private banks in India.

III. RESEARCH METHODOLOGY

3.1 Sample Selection

Universe of this study is all the commercial banks operating in India. Currently there are 21 private sector banks and 12 public sector banks. The sample of the study is a total of 20 banks which is further segregated into top 10 public sector banks and top 10 private sector banks operating in India according to market capitalization.

3.2 Data Collection

This study is based on secondary sources of data. List of the banks according to market capitalization was collected from official website of Indian Banking Association (IBA). Data related to financials of public and private sector banks in India was extracted from the annual reports of respective banks. The study covers five-year period ranging from 2018 to 2022.

3.3 Methodology used for Calculation of VAIC™

IC performance of banks has been measured using Value Added Intellectual Coefficient (VAIC™) methodology. VAIC™ method was developed by Pulic (1998). One of the pioneers in the field of IC research, Pulic (2000) was the first to base his studies purely on company balance sheet figures, i.e. financial indicators, and to concentrate explicitly on the relationship between IC and economic performance. VAIC™ method offers a reliable framework for assessing the performance of intellectual capital as it draws its data from publicly available annual reports of firms, which is accurate and verified (Pulic, 2000). Numerous studies have used the VAIC technique to examine various facets of IC effectiveness in banks and other organizations across many nations (Bontis, 2001; Chen et al., 2005; Goh, 2005; Joshi et al., 2013; Kamath, 2007; Singh et al., 2016)

Currently the best tool to measure IC performance in banks is VAIC™ (Chan, 2009; Goh, 2005) because it uses already-existing accounting data, uses a comparison and standardized methodology, takes into consideration human value, and assesses the effectiveness of organizations (Veltri & Silvestri, 2011). It is an analytical process intended to make it possible for the different stakeholders to efficiently monitor and assess the effectiveness of Value Added by a firm's overall resources and each significant resource component. A high coefficient means that the company's resources, including IC, are creating more value (Gan & Saleh, 2008). In this method, ranking of the organizations is done based on their capacity to generate value through IC (Singh et al., 2016).

The VAIC™ methodology is based on three variables namely- HCE which indicates value added coefficient of human capital; SCE which indicates value added coefficient of structural capital and CEE which indicates value added capital employed coefficient. Stages in calculation of VAIC™ are as follows (Pulic, 2004):

Stage 1- Determination of Total Value Added (VA)

VA is calculated by subtracting operating expenses from operating revenues. Equation (1) specifies the formula used for calculation of VA.

$$VA=OP+EC+D+A \quad ---(1)$$

Where, OP= Operating Profits
EC=Employee Cost
D= Depreciation
A=Amortization

Stage 2- Calculation of Human Capital Efficiency (HCE)

The value that is added as a result of investments in employees and related skills and competencies is referred to as human capital efficiency (Alhassan & Asare, 2016). Pulic (1998, 2000) suggested using "total compensation and wage costs" as a proxy of a firm's human capital (HC). As a result, HCE is determined by dividing the total VA by the total salary and wages that the company pays to its employees i.e EC. Formula for calculating HCE is presented in equation (2).

$$HCE=VA/EC \quad ----(2)$$

Where, EC= employee Cost
VA=Value added

When salaries are low and VA is high, the company is effectively leveraging its HC. Low VA indicates that the company's HC is not being used effectively, which will result in low HCE.

Effective use of HC to create value through operating profit leads to higher HCE (Clarke et al., 2011).

Stage 3- Calculation of Structural Capital Efficiency (SCE)

Structural capital is IC that has been created internally and reflects the efficiency of a company's rules and procedures, the nature of its workplace, and the creativity of its research and development teams (Petty & Guthrie, 2000) Before calculating SCE, it is necessary to calculate Structural Capital (SC). According to Pulic (1998), difference between a firm's VA and human capital is a viable proxy for that firm's SC and this relationship is presented in form of equation (3).

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SC=VA-EC

------(3)

Where, VA= Value added

EC= Employee Cost

According to Pulic (1998), HC and SC have a proportionately inverse relationship when it comes to the process of creating value. Therefore, following formula [Equation (4)] is used for calculating SCE.

SCE=SC/VA

------ (4)

Where, SC= Structural Capital

VA= Value added

Stage 4- Calculation of Capital Employed Efficiency (CCE)

The capital employed efficiency gauges the value that is added by investments made by shareholders. According to Pulic (1998), IC must be combined with capital (both physical and financial) used because it cannot generate value on its own. CEE is calculated as the ratio of total VA to total capital employed (CE), where CE represents book value of a company's net assets (Pulic, 2000). Algebraic expression of CCE is shown in equation (5).

CCE=VA/CE

------- (5)

Where, VA= Value added

CE= Capital Employed

Stage 5- Calculation of Intellectual Capital Efficiency (ICE) and Value Added Intellectual Coefficient (VAIC^{TM})

ICE is the sum total of HCE and SCE. After calculation of ICE, VAIC is calculated which is sum total of ICE and CEE. The VAIC method's goal is to assess how well intellectual capital is used (Pulic, 2000). The Value Added Intellectual Coefficient is formed when the model converts the two elements of intellectual capital, human and structural capital, into financial figures.

IV. EMPIRICAL RESULTS AND DISCUSSIONS

This section presents analysis and interpretation of results concerning IC performance of public and private sector banks in India.

4.1 Analysis of Mean VAIC Scores of Indian Banks based on Ownership

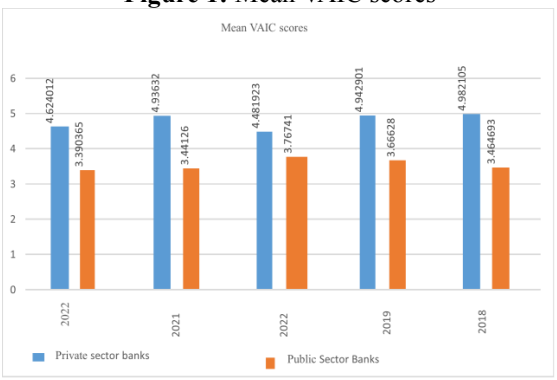
Table 2 and Fig. 1 represents the Average (Mean) VAIC Scores of Public and Private Sector Banks.

Table 2: Average (Mean) VAIC Scores of Public and Private Sector Banks

Type of Bank	2022	2021	2020	2019	2018
Private	4.624012	4.93632	4.481923	4.942901	4.982105
Public	3.390365	3.44126	3.76741	3.66628	3.464693

Source: Author's own compilation

Figure 1: Mean VAIC scores



Source- Author's own compilation

Results of Table 2 and Fig. 1 indicates that Private sector banks had higher VAIC scores when compared with public banks, highlighting that their use of intellectual capital was more effective. The findings show that the Public banks need to catch up to increase the efficiency of intellectual capital because they perform poorly on VAIC scores. This demonstrates unequivocally that, as relatively recent market entrants, private sector banks have been more successful in generating high value than public sector banks.

4.2 Analysis of Bank-wise VAIC Scores

Table 3 depicts the VAIC scores of private and public sector banks from the year 2018-2022.

Table 3: VAIC Scores of Banks

Bank Name	**2022**	**2021**	**2020**	**2019**	**2018**
Private Sector Banks					
HDFC	3.557541	3.503398	3.29163	3.87587	4.525081
ICICI	6.019271	6.488198	5.32432	5.3694	6.163235
KOTAK	5.003313	5.153623	4.42351	4.50805	4.284831

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AXIS	6.784161	6.618883	7.05544	7.75743	5.742185
INDUS	7.1685	7.319612	6.88037	6.34157	5.689917
IDBI	4.301533	4.166019	3.36231	3.70563	6.498958
BB	5.670864	6.06204	5.91978	5.67044	5.514711
AU	3.052618	4.069341	3.36983	2.91205	3.133626
YB	1.717145	2.908506	2.10419	4.21806	4.462481
IDFC	2.965179	3.073576	3.08785	5.07051	3.806029
Public sector banks					
SBI	2.96881	3.092787	3.20209	3.04386	3.562295
BOB	3.678024	3.6034	4.16956	4.6227	4.554009
CAN	3.588524	3.29188	2.97444	3.62348	3.507983
PNB	3.500748	3.453404	4.85837	4.85572	4.067483
IOB	3.364129	3.322246	2.73211	3.71724	2.896661
UB	3.953996	3.95115	4.62023	4.17851	4.158704
IB	3.683672	3.568756	4.51811	4.03651	4.236504
BOI	3.085593	3.396192	3.62533	3.01223	3.192286
CB	2.951974	2.756229	2.64602	2.46436	2.201876
UCO	3.128186	3.976553	4.32785	3.10819	2.269133

Source- Author's own compilation

It can be observed from Table 3 that all the banks have improved their VAIC scores over a five year period ranging from 2018-2022. However private sector banks have exhibited better VAIC scores as compared to public sector banks.

4.3 VAIC Element-Wise Matrix of Performance

Table 4 presents the component vise (HCE, SCE & CEE) performance of private and public sector banks. Fig. 2 and Fig. 3 presents intra sector performance of banks in private and public sector in India.

Table 4: VAIC Element-Wise Matrix of Performance

	CEE	**HCE**	**SCE**	**VAIC™**	**Rank**
Private sector banks					
HDFC	0.02	3.06	0.69	3.75	7
ICICI	0.03	5.04	0.8	5.87	3
KOTAK	0.15	3.8	0.73	4.67	5
AXIS	0.03	5.93	0.83	6.79	1
INDUS	0.04	5.81	0.83	6.7	2
IDBI	0.03	3.67	0.71	4.41	6
BB	0.08	4.9	0.8	5.77	4
AU	0.05	2.64	0.62	3.31	9
YB	0.03	2.38	0.68	3.08	10
IDFC	0.03	2.93	0.64	3.6	8
Average	**0.049**	**4.016**	**0.733**	**4.795**	
Public sector banks					
SBI	0.03	2.54	0.6	3.17	9
BOB	0.03	3.4	0.7	4.12	4
CAN	0.02	2.74	0.63	3.4	6
PNB	0.03	3.42	0.7	4.14	3
IOB	0.03	2.57	0.6	3.2	8
UB	0.02	3.44	0.71	4.17	2
IB	0.03	3.29	0.69	4	5
BOI	0.02	2.62	0.62	3.26	7
CB	0.02	2.06	0.51	2.6	10
UCO	0.03	2.72	0.61	4.4	1
Average	**0.026**	**2.88**	**0.637**	**3.646**	

Source- Author's own compilation

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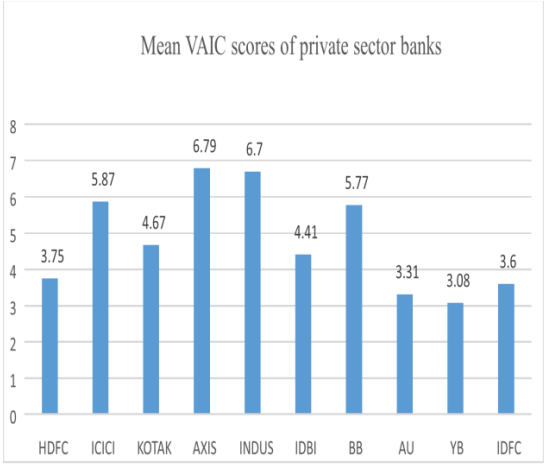
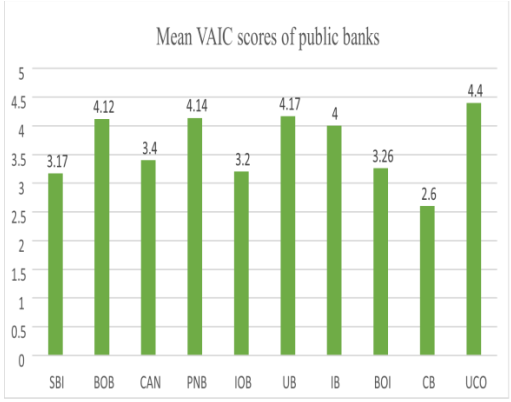
Figure 2: Mean VAIC Scores of private sector banks



Source- Author's own compilation

Figure 3: Mean VAIC Scores of public sector banks



Source- Author's own compilation

Results of Table 4 and Fig. 2 indicates that among Private sector banks Axis bank has shown a high VAIC (6.79) score over a period of 2018-2022 followed by Induslnd Bank (6.7) and ICICI Bank (5.87). These results are consistent with Ahuja &Ahuja (2012) where Axis bank had highest VAIC score (5.035) followed by ICICI Bank (4.595) and Singh et al. (2016) where Axis bank had highest VAIC (7.36) scores followed by ICICI bank (6.85).

Also, four private sector banks out of ten have above average VAIC score ranging between 5.77 to 6.79. VAIC scores among public sector banks ranges between 2.6 to 4.1. These results clearly show that public sector banks are lagging behind as far as utilization of IC is concerned. Five out of ten public sector banks have displayed above average VAIC scores. A higher VAIC means greater returns for various stakeholders and acts as a cushion to absorb operating costs. It is noteworthy that during the post-liberalization and reform phase of 1991, the majority of private sector banks were given open entry to the banking sector (Singh et al., 2016) which is the main reason for high VAIC scores of private banks.

Table 4 also presents the relative contribution of each element of VAIC. It is evident from the table that HCE is the major component of VAIC as it significantly contributes to VAIC. These results are similar to the other studies where HCE was found to be major contributor in VAIC (Ahuja & Ahuja, 2012; Goh, 2005; Joshi et al., 2013; Kamath, 2007). For private sector banks, 83.75 per cent of VAIC is contributed by HCE. For public sector banks, 79 per cent of VAIC is contributed by HCE. Private sector banks exhibited more value added coefficient of human capital (HCE) i.e. 4.016 as compared to public sector banks (2.88). Because they are unable to match the market-related remuneration provided by the private sector, public sector banks are far more disadvantageous than private sector banks as far as HCE is concerned (Singh et al., 2016).

Mean SCE scores of private sector banks (0.733) are better in comparison with public banks (0.637). Since the Reserve Bank of India's policy guidelines permit the conversion of existing no-frills accounts into basic savings accounts, there is plenty of room for development in SCE. With more technology and innovation, private banks appear to manage their SCE more effectively (Singh et al. 2016). Same is the results for CEE. Private sector banks outperformed in CEE than public sector banks. Among public sector banks, average CEE ranges between 0.02 to 0.03 while among private sector banks, it ranges between 0.02 to 0.15. These results indicate that public sector banks in India appear to have produced a sizeable chunk of inefficient labour that does not add anything to overall value creation.

It is clear from Fig. 3 that even the biggest Indian commercial bank, SBI, which has a 200-year history and a massive market share, unexpectedly placed ninth on VAIC scores among public sector banks. SBI's poor performance on the HCE and SCE scores only serves to emphasize how even the biggest and oldest banks could experience long-term problems if they don't effectively manage their human and intellectual capital.

V. CONCLUSIONS, LIMITATIONS AND PROSPECTS FOR FUTURE RESEARCH

5.1 Conclusion

While making investment decisions, non-financial factors that affect a company's long-term success are also critically examined by today's investors in addition to the financial factors. The utility of rating the companies purely on conventional measurements as they appear in a company's financial reports is called into

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question by these new non-financial factors. Consequently, the company's intangible assets have drawn significant interest from all sectors of the industry. If a company wants to survive in this changing business environment, then it has to effectively utilize its IC.

Banking sector relies heavily on human capital. By using VAIC methodology to compare IC performance of public and private banks in India, this study concluded that private sector banks had higher VAIC scores when compared with public banks, highlighting that their use of intellectual capital was more effective. However as far as individual components of VAIC are concerned, HCE is a major contributor to VAIC scores. HCE and SCE was highest for private sector banks i.e Axis Bank (5.93 & 0.83). One of the reasons for declining IC performance of public banks can be attributed to large number of Non-performing assets. So, banks must examine all of the components of their intellectual capital performance in order to identify the factors impeding their progress so as to increase the overall worth of intellectual capital. Finding the root causes of the problem will make it easier to formulate solutions and strategies that will allow for greater value creation.

5.2 Limitations and Prospects for Future Research

This study suffers from some limitations. First, the focus of this study was only on the public and private sector banks thereby ignoring other banks like foreign banks, RRB or co-operative banks. Further study can focus on gauging the IC performance of these banks. Secondly, present study only discussed the IC performance of banks. Future research in this domain can explore the relationship between VAIC scores and banks profitability as well as productivity. The time period used for this study is small i.e. five years ranging from 2018-2022. Future studies can present detailed analysis of IC performance of Indian banks over a longer time period. Lastly, results of the study are context specific may not be generalizable to other countries or non-banking sectors.

Regardless of the limitations, the findings of the study have following implications. Results of present study would help the banking institutions in identifying their core competencies as far as IC is concerned. The findings could help bankers to effectively implement knowledge management systems in their banks and identify the factors that significantly impacts IC performance so that they can contribute to value creation. It would also help the potential investors by providing the information so that they can gauge how efficiently banks are utilizing their IC. These results indicate that public sector banks in India appear to have produced a sizeable chunk of inefficient labour that does not add anything to overall value creation. So, management of these banks needs to revive their strategies and create a knowledge intensive culture in their banks to come at par with private sector banks.

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Appendix

Table A1: Names of banks, abbreviations used and market capitalization

SR. No	Bank name	Abbreviation used	Market Cap as at 31 March 2022 (Rs, Crore)
	Private Sector Banks		
1	HDFC Bank	HDFC	833854.18
2	ICICI Bank	ICICI	627871.17
3	Kotak Mahindra	KOTAK	382434.58
4	Axis Bank	AXIS	241097.58
5	Induslnd Bank	INDUS	88135.34
6	IDBI Bank	IDBI	47256.81
7	Bandhan Bank	BB	46117.72
8	AU Small Financ	AU	44776.04
9	Yes Bank	YB	43971.49
10	IDFC First Bank	IDFC	31288.02
	Public Sector Banks		
11	State Bank of India	SBI	493932.64
12	Bank of Baroda	BOB	71364.80
13	Canara Bank	CAN	44174.07
14	Punjab National Bank	PNB	42942.96
15	Indian Overseas Bank	IOB	35442.02
16	Union bank	UB	24741.79
17	Indian bank	IB	21191.18
18	Bank of India	BOI	18568.64
19	Central bank	CB	15625.69
20	UCO Bank	UCO	13330.89

Source: Author's own compilation