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EVALUATING THE OPERATIONAL PERFORMANCE OF NIFTY 50-ASSOCIATED BANKS: AN EMPIRICAL INVESTIGATION OF EFFICIENCY RELATIVE TO INDEX WEIGHTAGE

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ABSTRACT

The Nifty 50 Index, a prominent benchmark on the National Stock Exchange of India, has evolved into a cornerstone of the Indian capital market since its inception in November 1995. As of March 31, 2023, the Nifty 50 represented approximately 52% of the total full market capitalization and around 63% of the free float market capitalization of listed stocks on the NSE, showcasing its dominance in the Indian equity landscape. Apart from examining its growth, market representation, and sectoral composition and offering insights into its performance, this paper examines the performance of banks included in the Financial Sector, the largest among all sectors in the index and compares the performance against the weightage of the banks in the Index. With two powerful metrics i.e., Value Added Intellectual Coefficient (VAIC) and Return on Equity (ROE), the paper examines if the efficiency of the banks justifies its weightage in the Nifty 50 Index. The result indicates that apart from market capitalization, the efficiency of the bank plays a crucial role in the weightage, irrespective of the size of the bank.

KEYWORDS: Banking, Index, Performance, Nifty 50, VAIC.

JEL Classification: G200, G210, O150

1. INTRODUCTION

The Nifty 50 Index, launched in November 1995, has become synonymous with the Indian equity market, serving as a key indicator for investors. The Nifty 50, comprising 50 large Indian companies (refer Annexure 1 for the list of Nifty 50 Companies), collectively represents about 52% of the total full market capitalization, approximately 63% of the free-float market capitalization, and 41% of the total liquidity of traded equity stocks on the NSE, based on a 6-month average as of March 31, 2023 (refer Annexure 2 for attributes composing Nifty 50 over the years). Notably, as of the same date, the Financial Services, Information Technology, and Oil, Gas, and Consumable Fuels sectors dominate the index, accounting for 63.9% (refer to Annexure 3 for the sectoral composition of Nifty 50 across years). These sectors have witnessed significant growth, aligning with the broader economic trends. The sectoral composition has evolved over the years, reflecting changes in the Indian economy.

The index has provided positive returns in 19 out of 25 calendar years, showcasing its resilience across market cycles. The Nifty 50 Total Return Index, factoring in dividends reinvested, has delivered annualized returns of 13.5% with annualized volatility of 22.7% since June 30, 1999. Over the last 15, 5, and 1 year(s), the Total Return Index has achieved CAGRs of 10.4%, 12.8%, and 0.6%, respectively, maintaining a reasonable risk-return profile.

The growing Assets under Management (AUM) of passive funds tracking the Nifty 50, amounting to Rs. 2.34 trillion as of March 31, 2023, reflects the increasing adoption and recognition of the index as a preferred benchmark in the Indian equity market.

The Financial Services sector holds 37.7%, being the largest share in the Nifty 50. This underscores the sector's pivotal role in the index's composition. The financial sector plays a pivotal role in the Nifty 50 Index. As of 31st March 2023, this sector comprised 10 companies (6 banks, 2 Non-bank finance companies and 2 insurance companies). The 6 banks are HDFC Bank Ltd., ICICI Bank Ltd., Axis Bank Ltd., Kotak Mahindra Bank Ltd., State Bank of India and IndusInd Bank Ltd. respectively in terms of the weightage in the Index.

2. OBJECTIVE

The objective of this study is to assess the efficiency of banks within the Nifty 50 Index and juxtapose it with their respective weightage. The objective is to ascertain whether the banks' efficiency aligns with their designated weightage, despite variations in the parameters used for index weightage calculation. The evaluation of efficiency hinges on two key indicators: VAIC and ROE. VAIC scrutinizes the efficiency of Intellectual capital within banks, while ROE appraises the efficacy of equity in generating returns. By employing these metrics, the study seeks to provide insights into the congruence between banks' operational efficiency and their weightage in the Nifty 50 Index, shedding light on the interplay between intellectual capital and equity in shaping their financial performance. We briefly discuss VAIC and ROE.

3. THE BACKGROUND AND STUDIES ON VAIC

Intellectual capital holds a pivotal role in the banking sector due to the demand for skilled manpower in highly competitive and digitally driven operations. The industry's digital

transformation over the last two decades has made Indian banks more competitive and innovative, emphasizing the significance of human resources in retaining and attracting customers. India's diverse banking landscape, comprising large, small, public, and private sector banks, offers substantial opportunities for industry development. As a crucial contributor to India's economic growth, the banking sector's selection for this study aligns with its role in bridging the banking access gap for most of the population. Pulic's (2005) perspective underscores the strategic importance of intellectual capital, emphasizing its role in transforming skills into value creation. In the 21st century, intellectual capital emerges as a key driver of success, surpassing the traditional importance of tangible capital like cash and fixed assets.

A prominent method for assessing Intellectual Capital (IC) is the "Value Added Intellectual Coefficient" (VAIC), developed by Ante Pulic. Particularly relevant in industries reliant on human knowledge, such as software, pharmaceuticals, banking, biotechnology, and tourism, VAIC gauges corporate success by combining physical and intellectual capital measures. It directly evaluates IC based on published financial statements, aligning with Pulic's approach to measure a firm's market value through the efficiency of tangible assets and deployed IC, recognizing their collective significance for a company's survival.

The Value-Added Intellectual Coefficient (VAIC) relies on Physical as well as Intellectual Capital (IC), which includes Human Capital (employees and their value-adding abilities) and Structural Capital (information systems, labs, and market intelligence). VAIC initiation involves calculating Value Added (VA), which is the difference between output and input, treating human expenditure as capital. Different formulations for VA, such as Public (2004) and Purohit & Tandon (2015), offer distinct perspectives but yield the same result. Kamath (2008, 2015) and Ghosh & Mondal (2009, 2012) also use Public's (2004) formula, emphasizing value-added creation and distribution within the firm. VAIC comprises HCE (Human Capital Efficiency), SCE (Structural Capital Efficiency), and CEE (Capital-Employed Efficiency), collectively representing the efficiency of human, structural, and physical assets. Algebraically, VAIC is the sum of these three elements.

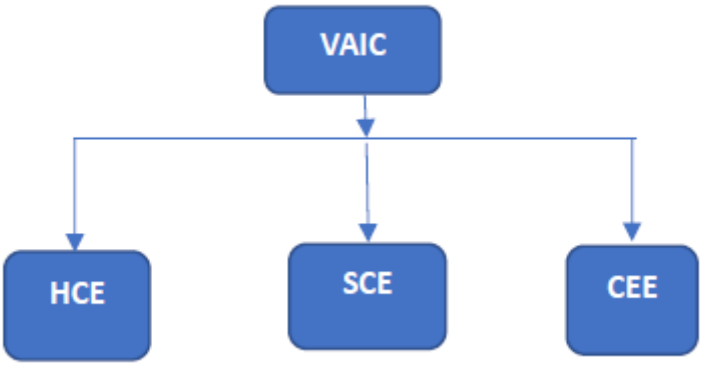

Figure 1: Conceptualization of VAIC

While the ascendancy of intellectual capital is evident, the intrinsic value of physical capital persists. A harmonious coexistence of intellectual and physical capital is imperative for the creation of value-added products and services. Traditional indicators like EBIT may present positive results,

but they fail to unveil whether value is being created or eroded. VAIC indicators serve as a crucial tool in determining this, carrying economic and social implications. The shift towards value creation benefits all stakeholders—employees, managers, shareholders, and the government. Companies now require value creators, and manager's adept not only in organizational processes but also in perpetuating continuous value augmentation.

Public (2004) delineates efficiency levels through VAIC, where a score of 2.50 or higher indicates a very successful business, ensuring safety in operations. Conversely, a score of 1.00 or lower signals a precarious situation, jeopardizing the company's continuity. Identifying and rectifying processes contributing to value destruction is paramount for enhancing VAIC in the face of increasing competition and globalization. A sector-specific benchmark for VAIC can guide companies towards maintaining or improving their position.

Public (2004) identifies indicators of declining value-added efficiency, including a drop in value-added compared to previous periods, reduced value creation efficiency, falling below sector averages, and inflation outpacing value creation. Monitoring these indicators is essential to sustain business productivity.

VAIC stands out among other metrics like Profit Rate, ROI, EVA, and SVA, which hinge on tangible capital. VAIC's stable basis of measurement, derived from audited financial statements, provides authenticity and verifiability (Pulic, 2000a & 2000b), distinguishing it as a robust gauge of a company's value creation. As companies face the imperative of constant improvement in value addition, VAIC proves to be a vital managerial and strategic tool, ensuring not only survival but also thriving in a dynamic business landscape.

Using the VAIC model, numerous studies have explored the relationship between Intellectual Capital (IC) and firm performance. Although the findings vary, several researchers have investigated specific sectors, such as banking, pharmaceuticals, IT, and various industries listed on stock exchanges.

In the banking sector, Public (2002) analyzed Croatian banks using VAIC, observing significant performance differences. Similar positive influences of IC on firm performance were noted in studies on Japanese and Greek banks (Mavridis, 2004; Mavridis and Kyrmizoglou, 2005) and Turkish banks listed on the Istanbul Stock Exchange (Yalama and Coskun, 2007). Contrarily, Puntillo (2009) found in Italian banks that only physical assets impacted performance, not IC. The Malaysian (Goh, 2005) and Bangladeshi (Mohiuddin et al., 2006) banking sectors highlighted the superior influence of Human Capital on profitability.

In the pharmaceutical sector, Kamath (2008) analyzed Indian firms, showing Human Capital's impact on profitability. However, Purohit & Tandon (2015) found limited relationships between VAIC components and performance indicators for IT and pharma entities listed on the Bombay Stock Exchange.

Studies have also covered diverse sectors. Nagaraj & Vinay (2016) explored Indian companies, establishing the impact of IC on firm value. Kamath (2015) focused on S&P BSE-sensitive index firms, demonstrating IC's influence on profitability, particularly from Human and Structural Capital.

Critiques of VAIC include Stahle et al. (2011), questioning its narrow focus on Human, Structural, and Physical Capital. Xu & Liu (2020) extended VAIC by including R&D and Advertising/Marketing expenses, demonstrating improved efficiency indicators in South Korean manufacturing firms.

4. STUDIES ON ROE

The relevance of Return on Equity (ROE) in the banking industry has been the subject of extensive research and discussion. Researchers have explored dimensions of ROE, including its determinants, implications, limitations, and its role in assessing the financial performance and risk profile of banks.

Numerous studies, including Berger (1995) and Altunbas et al. (2007), have investigated the determinants of ROE in the banking industry. These determinants include factors such as asset quality, capital adequacy, leverage, efficiency, and risk-taking behavior. Understanding these determinants is crucial for assessing the true meaning of ROE in the banking context. ROE is widely regarded as a key measure of profitability in the banking industry. Demirgüç-Kunt and Huizinga (1999) and DeYoung et al. (1997) emphasize the significance of ROE in evaluating how efficiently banks utilize their equity to generate profits. It provides insights into the overall financial health and performance of banks. The relationship between ROE and market valuation in the banking industry has been explored by Barth et al. (2001) and Berger and Hannan (1989). These studies examine how investors perceive and value banks based on their ROE. A higher ROE is often associated with a positive market response. Comparative analyses of ROE across different banks help identify variations in performance. Athanasoglou et al. (2008) and Pasiouras et al. (2009) conducted such analyses to understand the relative performance of banks and the factors contributing to differences in ROE. The relationship between ROE and risk management in banks is a critical aspect. Merton (1977) and Berger et al. (1995) explore the delicate balance between achieving higher ROE and managing risks effectively. Excessive risk-taking can impact the sustainability of elevated ROE. The robustness of ROE during financial crises is examined by Hitt et al. (2018). Understanding how ROE behaves in times of economic downturns provides insights into the resilience of banks and the effectiveness of ROE as an indicator during crises. International perspectives on ROE in banking are explored by Cull et al. (2005) and Goddard et al. (2007). These studies consider how economic and institutional differences across countries influence the relationship between ROE and financial performance. Berger and Mester (2003) examine the impact of technological changes on ROE in the banking industry. The evolving nature of the banking sector, especially with advancements in technology, can affect how ROE is interpreted and utilized. The relevance of ROE in the context of sustainable banking practices is an emerging area of interest. Researchers examine how banks can maintain a balance between profitability, environmental and social responsibility, and governance (ESG factors) while still achieving a competitive ROE.

The literature highlights the multifaceted nature of ROE in the banking industry. Researchers emphasize its role as profitability metric, its relationship with market valuation, and its sensitivity to various internal and external factors. Understanding the relevance of ROE in the banking sector requires a comprehensive analysis that considers the intricacies of bank operations, risk management, and the evolving landscape of the financial industry.

5. METHODOLOGY

The research mainly uses VAIC and ROE metrics for comparison with the stock's weightage in the Nifty 50. Apart from these, the study also examines the Compounded Annual Growth Rate (CAGR) of Sales and Net Profits. The study employs the data of past 12 years i.e., from financial year 2011 to 2023, obtained from the Annual Financial Returns of the banks, through www.screener.in.

5.1 The most popular formula of calculating VAIC which was proposed by Public (2004):

Value Added (VA) = Operating Profit (OP)+Employee Cost (EC) + Depreciation (D) + Amortization(A)

The calculation of VAIC is graphically shown in Figure 2

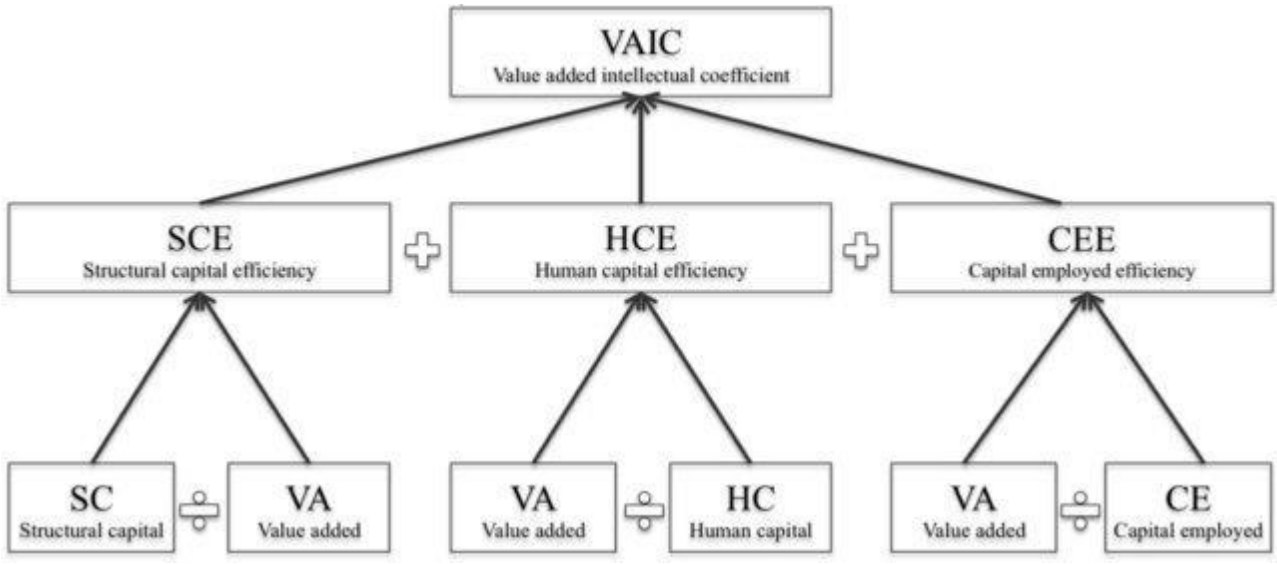

Figure 2: Formulae for the construction of VAIC.
Source: Public A., 2004

It is to be noted that according to Pulic (2004), SCE is calculated as (VA-HC) / VA

We compute the VAIC and its elements i.e., HCE, SCE and CEE for 12 years from the financial year 2011-12 to the financial year 2022-23, compute the CAGR for 12 years and compare the HCE and VAIC of all banks as these are the main attributes in the banking industry (refer shireen R & Chandra S (2022)).

5.2 Return on Equity (ROE) is calculated as follows:

EBIT (Earnings before Interest & Tax) / (Equity share capital + Reserves)) x 100

We analyze the Return on Equity (ROE) over 12 years spanning from the fiscal year 2011-12 to the fiscal year 2022-23, comparing the ROE across all banks during this timeframe.

Additionally, we graph the yearly sales and net profits of the banks, calculating the Compound Annual Growth Rate (CAGR) over the 12 years. Furthermore, we depict the market capitalization of the banks as of March 31st for each of the 12 years from the fiscal year 2011-12 to the fiscal year 2022-23.

6. FINDINGS

Table1: HCEoftheBanksoverthe12years

	HCE	Mar-12	Mar-13	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22	Mar-23	CAGR
1	HDFC BANK	3.30	3.54	4.09	4.25	4.21	3.85	4.20	4.40	4.05	4.23	4.30	4.19	2.01
2	ICICIBANK	3.30	3.44	3.86	3.90	3.13	2.86	2.47	1.89	2.79	3.54	3.87	4.04	1.70
3	AXIS BANK	3.94	3.98	4.31	4.23	4.27	2.37	1.21	2.39	2.05	2.58	3.37	4.28	0.71
4	KOTAK	2.75	2.92	3.04	3.00	2.39	2.91	3.23	3.31	3.09	3.31	3.32	3.40	1.78
5	SBI	2.17	2.13	1.78	1.88	1.63	1.11	0.74	1.20	1.70	1.67	1.87	2.28	0.40
6	INDUSINDBANK	3.61	3.49	3.75	3.89	3.93	3.99	4.19	3.81	3.89	2.84	3.60	4.37	1.61

Table2: VAICoftheBanksoverthe12years

	VAIC	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	CAGR
1	HDFC BANK	4.03	4.30	4.89	5.05	5.01	4.64	5.00	5.21	4.84	5.03	5.11	4.99	1.78
2	ICICIBANK	4.02	4.18	4.64	4.68	3.84	3.53	3.09	2.38	3.46	4.29	4.64	4.82	1.52
3	AXISBANK	4.72	4.77	5.12	5.03	5.07	2.96	1.40	2.99	2.57	3.22	4.10	5.09	0.63
4	KOTAK	3.48	3.65	3.78	3.74	3.02	3.63	3.98	4.07	3.82	4.05	4.07	4.16	1.50
5	SBI	2.74	2.68	2.24	2.37	2.03	1.22	0.40	1.38	2.13	2.09	2.36	2.86	0.38
6	INDUSIND BANK	4.36	4.24	4.52	4.67	4.72	4.77	4.99	4.57	4.67	3.51	4.35	5.17	1.43

Table3: ROE of the Banks over the 12 years

	ROE	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	HDFC BANK	19%	21%	22%	20%	19%	18%	18%	17%	16%	16%	17%	17%
2	ICICIBANK	13%	15%	15%	15%	11%	10%	7%	4%	8%	13%	15%	17%
3	AXISBANK	20%	19%	18%	18%	17%	7%	1%	8%	2%	8%	13%	15%
4	KOTAK	15%	16%	14%	15%	12%	14%	14%	13%	14%	13%	13%	14%
5	SBI	16%	16%	10%	11%	7%	0%	-2%	1%	7%	9%	12%	17%
6	INDUSIND BANK	18%	17%	17%	18%	16%	15%	16%	13%	14%	7%	10%	14%

The HCE of the banks for the 12 years is shown in Table 1. In the assessment of 2023 scores, HDFC Bank emerges with the highest Human Capital Efficiency (HCE), surpassing both IndusInd Bank and Axis Bank, signifying exceptionally efficient workforce management in these banks. Conversely, SBI exhibits the lowest HCE at 2.28 in 2023, a relatively lower value compared to other Nifty 50 index banks.

Examining the Compound Annual Growth Rate (CAGR) of HCE, HDFC Bank takes the lead, demonstrating consistent improvement in employee efficiency over time. Following suit are Kotak Bank and ICICI Bank, showcasing upward trends in their HCE. In contrast, SBI records the lowest CAGR in HCE, suggesting a comparatively slower growth in employee efficiency.

The VAIC of the banks for the 12 years is shown in Table 2. In 2023, IndusInd Bank records the highest Value-Added Intellectual Coefficient (VAIC), with Axis Bank and HDFC Bank following closely. Conversely, SBI exhibits the lowest VAIC, reflecting a notably low efficiency in value creation.

Examining the Compound Annual Growth Rate (CAGR) of VAIC, HDFC Bank leads with the highest growth, trailed by ICICI Bank and Kotak Bank. In contrast, SBI records the lowest CAGR in VAIC, indicating a minimal increase in value creation efficiency over time.

The ROE of the banks for the 12 years is shown in Table 3. In 2023, the highest Return on Equity (ROE) is observed in three banks: HDFC, ICICI, and SBI. Notably, HDFC Bank's ROE has maintained a relatively steady performance over the 12 years, while the ROE of other banks has displayed more fluctuation during this timeframe.

Similarly, in terms of Net Profits, IndusInd Bank exhibits the highest CAGR, trailed by HDFC Bank and Kotak Bank, while Axis Bank shows the slowest growth.

As of March 31, 2023, HDFC Bank holds the highest market capitalization, followed by ICICI Bank and Kotak Bank. Despite being the largest bank in India, SBI ranks fourth in market capitalization. Market capitalization is almost in line with the Nifty 50 weightage.

The respective rankings of these metrics are presented in Table 4 below for comparison, and their significance is assessed with the weightage in the Nifty 50.

Table 4: Ranking of various metrics and comparison with the Nifty 50 weightage

Bank	Weight again Nifty 50	Market Cap As on 31.3.2023	CAGR Of Sales	CAGR Net Profits	ROE as on 31.3.2023	VAIC	No. of Branches	Sales FY2023
HDFC Bank	1	1	2	2	1	3	2	2
ICICI Bank	2	2	5	4	3	4	3	3
Axis Bank	3	5	4	6	4	2	4	4
Kotak Mahindra	4	3	3	3	5	5	6	5
State Bank of India	5	4	6	5	2	6	1	1
IndusInd Bank	6	6	1	1	6	1	1	6

From Table 4 SBI ranks number 1 in the number of branches and annual sales. These go to state that the Nifty 50 weightage is not dependent on these parameters, as the ranking of weightage in Nifty 50 is 5th for SBI. The market capitalization of banks is almost in line with the Nifty 50 weightage and so also efficiency expressed in terms of VAIC and ROE. Hence, it can be safely concluded that there is a direct correlation between the weightage of Nifty 50 and the efficiency of banks.

7. CONCLUSION

The Nifty 50 Index, with its robust market representation, sectoral diversity, and consistent performance, remains a vital barometer for investors navigating the dynamic Indian equity landscape. Its journey from a base value of 1000 in 1995 to touching 20,000 on September 11, 2023, underscores its enduring significance over 27 years. As the financial markets continue to evolve, the Nifty 50 stands as a beacon guiding investors in their pursuit of informed investment decisions.

Our analysis reveals that HDFC Bank outperforms in various metrics, including HCE, VAIC, ROE, sales growth, and net profit growth. Additionally, HDFC Bank boasts the highest market capitalization among the banks listed in the Nifty 50, justifying its pivotal position and the corresponding weightage assigned to it in the index. While other banks also exhibit notable market capitalization, the order in terms of other metrics doesn't precisely align with the assigned weightage.

While comparing the ranking of all metrics in comparison to the weightage in the Nifty 50, it is evident that the results of our analysis and the efficiency of the banks broadly align with the weightage distribution in the Nifty 50 index.

REFERENCES

Berger AN and Mester L (2003). Explaining the Dramatic Changes in Performance of US Banks: Technological Change, Deregulation, and Dynamic Changes in Competition. Journal of Financial Intermediation 12(1):57-95

Berger AN, Herring RJ, Szego GP (1995). The role of capital in financial institutions. Journal of Banking & Finance. Vol 19, 3–4, PP 393-430

Ghosh, S. and Mondal, A. (2009), "Indian software and pharmaceutical sector IC and financial performance", Journal of Intellectual Capital, Vol. 10 No. 3, pp. 369-88.

Mondal, A. and Ghosh, S. (2012) Intellectual Capital and Financial Performance of Indian Banks. Journal of Intellectual Capital, 13, 515-530.

Kamath G. B. (2007). The Intellectual Capital Performance of Indian Banking Sector. Journal of Intellectual Capital, 8(1).

Kamath, G.B. (2008) Intellectual Capital and Corporate Performance in Indian Pharmaceutical Industry. Journal of Intellectual Capital, 9, 684-704.

Kamath, B. (2015). Impact of Intellectual capital on Financial Performance and Market Valuation of Firms in India. International letters of Social and Humanistic Sciences Vol. 48. Pp 107-122

Kunt AD and Huizinga H (1999). Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence. The World Bank Economic Review. pp. 379-408.

Mavridis, D.G. (2004). "The intellectual capital performance of the Japanese banking sector". Journal of Intellectual Capital, Vol. 5 No. 1, pp. 92-115

Mavridis and Kyrmizoglou (2005). Intellectual capital performance drivers in the Greek banking sector. Management Research News 28(5):43-62

Nagaraja N & Vinay N (2016). The Effect of Intangible Assets on the Firm Value. International Journal of Engineering and Management Research. Volume-6, Issue-1, January-February-2016 . pp: 307-315

Pulic A (1998), "Measuring the Performance of Intellectual Capital in Knowledge Economy", available at www.measuring-ip.at /Opapers/Pulic/Vaictxt.vaictxt.html (Accessed on October 25, 2014).

Pulic A (2000a), "VAIC: An Accounting Tool for IC Management", International Journal of Technology Management, Vol. 20, Nos. 5/6/7/8, pp. 545-55.

Pulic A (2000b), "MVA and VAIC Analysis of Randomly Selected Companies from FTSE 250", available at vaic-on.net/downloads/ftse30.pdf (Accessed on October 26, 2014).

Pulic, A. (2004), "Intellectual capital – does it create or destroy value?", Measuring Business Excellence, Vol. 8 No. 1, pp. 62-8.

Pulic, A. (2005), Value Creation Efficiency at National and Regional Levels: Case Study – Croatia and The European Union, in A. Bounfour & L. Edvinsson (Eds), Intellectual Capital for Communities, Elsevier, Oxford.

Puntillo P (2009). Intellectual capital and business performance. Evidence from Italian banking industry. Journal of Corporate Finance, 4 (12), pp. 97-11

Purohit, H. & Tandon K. (2015). Intellectual Capital, Financial Performance and Market Valuation: A Study on IT and Pharmaceutical Companies in India.

Stahle P, Aho S & Stahle S (2011). Value Added Intellectual Coefficient (VAIC): a critical analysis. Journal of Intellectual Capital.

Stewart T.A. (1991). Brainpower. How Intellectual Capital is becoming America's Most Valuable Asset. Fortune 3rd June.

Sveiby,E.(2001), "Methods for measuring intangible assets", available at: www.sveiby.com/ articles/IntangibleMethods.htm (accessed April 2, 2007).

Xu, J., & Liu, F. (2020). The Impact of Intellectual Capital on Firm Performance: A Modified and Extended VAIC Model. Journal of Competitiveness, 12(1), 161–176.

Yalama, A. and Coskun, M. (2007), "Intellectual capital performance of quoted banks on the Istanbul stock exchange market", Journal of Intellectual Capital, Vol. 8 No. 2, pp. 256-271

ANNEXURE1

List of Companies in Nifty 50 (ason1.4.2023)

1	Adani Enterprises	26	Infosys
2	Adani Ports	27	ITC
3	Apollo Hospital	28	JSW Steel
4	Asian Paints	29	Kotak Mahindra
5	Axis Bank	30	Larsen
6	Bajaj Auto	31	LTI Mindtree
7	Bajaj Finance	32	M&M
8	Bajaj Finserv	33	Maruti Suzuki

9	Bharti Airtel	34	Nestle
10	BPCL	35	NTPC
11	Britannia	36	ONGC
12	Cipla	37	Power GridCorp
13	Coal India	38	Reliance
14	Divis Labs	39	SBI
15	Dr Reddys Labs	40	SBI LifeInsura
16	Eicher Motors	41	Sun Pharma
17	Grasim	42	TATA Cons.Prod
18	HCL Tech	43	Tata Motors
19	HDFC Bank	44	Tata Steel
20	HDFC Life	45	TCS
21	Hero Motocorp	46	Tech Mahindra
22	Hindalco	47	Titan Company
23	HUL	48	Ultra Tech Cement
24	ICICI Bank	49	UPL
25	IndusInd Bank	50	Wipro

ANNEXURE 2

Nifty50 Attributes across Years

Attributes%	2023	2022	2015	2005	1995
Market Representation by Full MCAP (%)*	52.3	51.7	57.6	57.9	33.7
Market Representation by Average Turnover (%)*	40.7	37.7	45.1	42.2	62.2
Cumulative weight of top five Stocks (%)	40.6	40.5	34.7	38.5	31.7
Cumulative weight of bottom Five stocks (%)	2.3	2.4	1.7	2	1.8

*Weightfor2023^isasoflasttradingdayofMarch, weight for 2022, 2015, 2005 and 1995 are as of last tradingdayofDecember.Weightsfor2023,2022 and 2015 are calculated based on Free-Float market capitalization; Weights for 2005 and 1995 are based on Full market capitalization. Market representation of the Nifty 50 for 2023 is calculated based on 6 month March 2023 ended avg. full mcap and avg. turnover data, Market representation of the Nifty 50 for2022,2015,2005& 1995iscalculatedbasedon 6 month December ended avg. full mcap and avg. turnover data for the respective year

Source: Nifty50 White Paper, August 2023

ANNEXURE3

The Sectoral Composition Of Nifty50 Across Years

Sector	2023	2022	2015	2005	1995
Financial Services	37.7	37.7	31	12.8	20
Information Technology	14.1	14	16.3	20	-
Oil, Gas& Consumable Fuels	12.1	12.7	10.6	25	9.8
Fast Moving Consumer Goods	9.6	8.6	8.7	8	19
Auto mobile and Auto Components	5.3	5.3	9.9	6.8	12.2
Metals & Mining	3.8	4.2	1.3	5.5	10.9
Healthcare	3.4	3.8	7.3	4.2	2.7
Construction	3.4	3.1	3.7	1.8	4.5
Consumer Durables	3.0	3.1	1.4	-	-
Telecommunication	2.4	2.5	2.2	6.3	-
Power	2.1	1.9	2.6	1.5	2
Construction Materials	1.9	1.8	2.8	2.5	5.5
Services	0.6	0.8	0.8	1.1	1.1
Chemicals	0.5	0.5	-	0.8	7.7
Media,	-	-	0.8	0.5	-
Entertainment& Publication	-	-	0.5	3.1	0.6
Capital Goods	-	-	-	-	2.2
Textiles	-	-	-	-	1.9
Consumer Services	-	-	-	-	1.9

Weights of the sectors are as of December 31 for the respective year. Weights for 2022 and 2015 are calculated based on Free-Float market capitalization;
Weights for 2005 and 1995 are based on Full market capitalization. *Weight of sector for 2023 are as of 31st March 2023 based on Free-Float market capitalization.

Source: Nifty50 White Paper, August2023