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Comparative Analysis of Financial Health of Selected Banks in India: A Camel Framework Approach

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Abstract

The study aims to conduct a comparative analysis of the financial health of selected banks in India using the CAMEL framework. The research focuses on evaluating the financial stability and operational efficiency of major banks. By analyzing financial data spanning five years (2019–2024), the study aims to provide insights into how these banks manage capital, assets, liquidity, and profitability, as well as the role of management quality in determining overall financial health. The research will explore key indicators such as Non-Performing Assets (NPAs), Capital Adequacy Ratios (CAR), profitability ratios (ROA, ROE), and liquidity ratios to assess the banks' resilience and growth potential in a dynamic economic environment. By comparing the performance of public sector and private sector banks, the study seeks to identify their respective strengths, weaknesses, and risk management strategies, contributing valuable insights to investors, policymakers, and banking professionals. Ultimately, the research aims to provide a deeper understanding of how both categories of banks navigate financial challenges and capitalize on opportunities, ensuring long-term sustainability in the evolving Indian banking sector.

1. Introduction

The banking sector serves as the backbone of any economy, playing a crucial role in financial intermediation, economic stability, and development**.** Banks facilitate economic progress by mobilizing savings, providing credit, managing financial risks, and ensuring efficient capital allocation**.** A strong and well-regulated banking system is fundamental to supporting businesses, industries, and households in achieving their financial goals (Shubha & Naresh Babu, 2024). In recent decades, the Indian banking industry has undergone significant structural and technological transformations**,** influenced by liberalization, globalization, digitization, and evolving regulatory

frameworks (Banoth & Sreeramulu, 2024). The banking sector comprises public sector banks (PSBs), private sector banks (PVBs), foreign banks, regional rural banks (RRBs), and small finance banks (SFBs), each contributing uniquely to the country's financial landscape. Public sector banks, which have historically dominated the market, continue to hold a significant share of total banking assets due to their wider reach and government support. However, private sector banks have emerged as leaders in operational efficiency, technological adoption, and customer-centric innovations, allowing them to expand market share and improve financial performance (Shakeb & Azmi, 2024). Despite their importance, banks in India face multiple challenges, including rising non-performing assets (NPAs), stringent regulatory requirements, increasing competition, economic uncertainties, and financial stability concerns. The growth of fintech solutions, the emergence of digital banking, and changing customer preferences have reshaped the banking industry, making it imperative to assess bank performance using structured evaluation frameworks (Mahajan & Bhatia, 2024). Broader sectoral comparisons were conducted by Vijayalakshmi and Srinivasan (2023), who applied the CAMEL model to ten public and private sector banks, highlighting performance gaps and operational inefficiencies. Similarly, Kulshrestha and Srivastava (2022) studied 14 leading commercial banks (2011–2018) and found that private sector banks outperformed public sector banks due to better technological adoption and recovery mechanisms. One such widely accepted model is the CAMELS framework, which evaluates Capital Adequacy, Asset Quality, Management Efficiency, Earnings, Liquidity, and Sensitivity to market risk. This model helps in assessing banks' financial strength, stability, and risk management capabilities (Mahdy Othman & Nagina, 2024).

1.1. Overview of CAMEL Framework

The CAMEL framework evaluates banks using quantitative financial ratios across five key parameters: Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, and Liquidity. The following financial ratios help assess each parameter comprehensively.

1.1.1. Capital Adequacy (C)

Capital adequacy measures a bank's ability to absorb financial shocks and sustain operations during economic downturns. It ensures the bank maintains sufficient capital reserves to protect depositors and investors.

Key Ratios:

- Capital Adequacy Ratio (CAR)
- Debt-to-Equity Ratio (D/E)
- Total Advances to Total Assets

1.1.2. Asset Quality (A)

Asset quality evaluates credit risk and the soundness of a bank's loan portfolio. A high level of non-performing assets (NPAs) indicates increased risk exposure and weak asset quality.

Key Ratios:

- Net NPA to Advances
- Net NPA to Total Assets
- Total Investment to Total Assets

1.1.3. Management Efficiency (M)

Management efficiency examines how well the bank's leadership manages operations, risk control, and profitability.

Key Ratios:

- Credit to Deposit Ratio (CDR)
- Cost to Income Ratio (CIR
- Return on Net Worth (RoNW)

1.1.4. Earnings Quality (E)

Earnings quality evaluates the bank's ability to generate sustainable profits and reinvest in growth.

Key Ratios

- Operating Profit Margin (OPM
- Return on Equity (ROE)
- Return on Investment (ROI)

1.1.5. Liquidity (L)

Liquidity determines the bank's ability to meet short-term obligations without liquidity crises.

- Liquid Assets to Total Assets
- Liquid Assets to Total Deposits

The CAMEL framework provides a comprehensive approach to evaluating bank performance using capital adequacy, asset quality, management efficiency, earnings quality, and liquidity. **These** financial ratios help regulators, investors, and analysts assess the financial health of banks, identify risk factors, and ensure the stability of the banking system.

1.2 Objectives of the Study

1.2.1 Primary Objective

To assess and Compare the financial health of selected banks in India using the Camel framework

1.2.2 Secondary Objectives

- To compare the performance of different banks within the Indian banking sector, facilitating a better understanding of relative financial health.
- To identify the strengths and weaknesses of individual banks, providing insights into their operational efficiency and risk exposure.
- To Analyze how various banks, manage risks associated with capital, assets, and liquidity and its impact on financial health.

2. Method

The CAMEL analysis is conducted on five private sector banks and five public sector banks over the past five years to assess their financial performance and stability. The study evaluates financial performance of these banks based on key CAMEL parameters: Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, and Liquidity**.** This research paper analyzes the impact of financial performance using available data for the selected banks over the specified time period. Various financial ratios have been applied to assess the performance of the banks under study. The study relies on secondary data**,** extracted from annual reports of banks, Reserve Bank of India (RBI) publications, and other financial disclosures**.** The results from the analysis will help assess the comparative financial performance of private and public sector banks and provide insights into their financial stability and risk exposure**.** The CAMEL parameters and their formulas are summarized in the table (1) below:

Table 1 CAMEL Parameters & Formulas

Camel Parameter	Ratio	Formula
Capital Adequacy	Capital Adequacy Ratio (CAR)	CAR = (Tier 1+Tier 2 Capital / Risk weighted Asset) * 100
	Debt-to-Equity Ratio (D/E)	(Total Debt/Total Assets)*100
	Total Advances to Total Assets	(Total Advances/Total Assets)*100
Asset Quality	Net NPA to Advances	(Net NPA/Total Advances)*100
	Net NPA to Total Assets	(Net NPA/Total Assets)*100
	Total Investment to Total Asset	(Total Investment/ Total Asset)*100
Management Efficiency	Credit to Deposit Ratio (CDR)	(Total Deposits/ Total Advances)*100
	Cost to Income Ratio (CIR)	(Operating Expenses/Total Income)*100
	Return on Net Worth (RoNW)	(Net Profit/ Shareholders Equity)*100
Earnings Quality	Operating Profit Margin (OPM)	(Operating Profit /Total Income)*100
	Return on Equity (ROE)	(Net Profit/ Shareholders Equity)*100
	Return on Investment (ROI)	(Net Profit/Total Investment) *100
Liquidity	Liquid Assets to Total Assets	(Liquid Assets/Total Assets)*100
	Liquid Assets to Total Deposits	(Liquid Assets/Total Deposits)*100

3. Results

3.1 Capital Adequacy

Table 2 Capital Adequacy Ratios of Private Banks

Ratio	Year	Axis		HDFC	ICICI	IndusInd	Kotak
CAR	**2024**	16.63		18.8	16.3	17.23	21.8
	2023	17.64		19.26	18.3	17.86	23.3
	2022	18.54		18.5	19.1	18.42	23.7
	2021	19.12		18.79	19.1	17.38	23.4
	2020	17.53		18.52	16.1	15.04	19.8
D/E	**2024**	1.47		1.61	0.83	0.77	0.58
	2023	1.16		0.89	0.9	0.88	0.54
	2022	1.7		0.92	0.91	1.01	0.58
	2021	1.48		0.85	0.94	1.21	0.57
	2020	1.75		1.06	1.16	1.84	1
Total Advances to Assets	**2024**	65.81		63.67	53.35	66.65	56.04
	2023	64.63		65.69	55.36	63.35	57.89
	2022	60.67		65.69	52.53	58.35	57.49
	2021	62.86		67.56	50.3	58.57	52.67
	2020	62.84		66.02	51.27	67.32	56.38

Table 3 Capital Adequacy Ratios of Public Banks

Ratio	Year	SBI	PNB	BOB	Canara	Union Bank
CAR	**2024**	14.28	15.97	16.31	16.28	16.97
	2023	14.68	15.2	15.9	15.55	14.52
	2022	13.83	15.74	15.74	14.9	14.05
	2021	13.74	14.99	14.99	14.8	12.03
	2020	13.06	14.14	13.3	13.65	12.13
D/E	**2024**	1.65	0.73	0.86	0.71	0.92
	2023	1.58	0.76	0.74	0.84	0.65
	2022	1.6	0.67	1.12	0.78	0.87
	2021	1.72	0.63	0.87	0.95	0.93
	2020	1.47	1.08	1.27	1.26	1.93
Total Advances to Assets	**2024**	56.2	58.91	65.81	60.7	62.34
	2023	54.88	56.06	63.15	60.16	59.32
	2022	52.12	54.79	59.49	59.49	58.19
	2021	52.36	60.14	58.92	54.9	57.13
	2020	56.56	58.86	58.32	57.18	57.16

Source: *Annual Report of Banks, RBI Website*

Result: As per Basel III norms, banks must maintain a minimum CAR of 10.875%, while RBI mandates 9% for Indian banks. Private banks like Kotak Mahindra (21.80%) and HDFC (18.80%) have strong capital buffers, while public banks like SBI (14.28%) and PNB (15.97%) maintain moderate CAR levels. Union Bank (16.97%) and BOB (16.31%) remain stable, ensuring compliance. A declining D/E ratio in Union Bank (1.93 in 2020 to 0.32 in 2024) indicates lower debt reliance, while ICICI (0.83) and Kotak (0.58) reflect strong equity positions. Axis Bank (65.81%) and IndusInd Bank (66.65%) show aggressive lending, while ICICI (53.35%) follows a conservative approach. HDFC

(63.67%) and SBI (56.20%) maintain a balanced loan-to-assets ratio. A high ratio (>70%) may indicate risk-taking, while a low ratio (<50%) suggests inefficiency in asset utilization (Refer Table 2 & 3).

3.2 Asset Quality

Table 4 Asset Quality Ratios of Private Banks

Ratio	Year	Axis	HDFC	ICICI	IndusInd	Kotak
Net NPA to Advances (%)	**2024**	1.44	0.45	0.43	0.57	0.36
	2023	0.41	0.26	0.48	0.59	0.41
	2022	0.76	0.31	0.76	0.64	0.71
	2021	1.10	0.38	1.16	0.69	1.23
	2020	1.61	0.34	1.43	0.91	0.70
Net NPA To total asset (%)	**2024**	0.95	0.29	0.23	0.38	0.20
	2023	0.26	0.17	0.26	0.37	0.24%
	2022	0.46	0.21	0.40	0.38	0.39
	2021	0.69	0.25	0.58	0.41	0.65
	2020	1.01	0.22	0.73	0.61	0.39
Total Investment to total asset (%)	**2024**	21.89	24.96	35.00	20.68	32.10
	2023	21.44	20.22	32.66	18.14	31.47
	2022	22.97	21.17	32.37	17.65	30.11
	2021	22.30	24.39	34.10	19.19	32.78
	2020	16.73	24.63	32.18	19.51	25.09

Source: Annual Report of Banks, RBI Website

Table 5 Asset Quality Ratios for Public Banks

Ratio	Year	SBI	PNB	BOB	Canara	Union Bank
Net NPA To Advances	**2024**	0.64	0.70	0.96	0.99	0.82
	2023	0.67	1.07	2.72	1.45	1.34
	2022	1.00	1.72	3.15	2.65	2.70
	2021	1.50	2.83	5.73	3.84	4.62
	2020	2.23	3.13	4.90	4.22	5.49
Net NPA To total asset (%)	**2024**	0.64	0.89	0.96	0.89	0.90
	2023	0.70	1.64	2.69	1.72	1.64
	2022	1.00	1.72	3.59	2.27	2.70
	2021	1.50	1.71	4.32	2.70	3.84
	2020	2.00	3.13	6.65	4.28	5.49
Total Advances to Assets (%)	**2024**	56.2	58.91	65.81	60.7	62.34
	2023	54.88	56.06	63.15	60.16	59.32
	2022	52.12	54.79	59.49	59.49	58.19
	2021	52.36	60.14	58.92	54.9	57.13
	2020	56.56	58.86	58.32	57.18	57.16

Result: Private banks consistently maintain lower Net NPA to Advances, reflecting better risk management. HDFC Bank (0.45%) and ICICI Bank (0.43%) exhibit strong asset quality, whereas public banks like SBI (0.64%) and PNB (0.70%) have improved but still hold higher NPAs. Union Bank (0.82%) and Canara Bank (0.99%) show a declining trend, suggesting better loan recovery strategies. BOB (0.96%) significantly reduced NPAs from 4.90% in 2020 to 0.96% in 2024, demonstrating effective risk management. In terms of Net NPA to Total Assets, HDFC Bank (0.29%) and ICICI Bank (0.23%) have minimal risk exposure, while public banks, except SBI, report higher ratios. Union Bank (1.09%) and Canara Bank (0.89%) have shown steady improvement, but PNB (0.89%) and BOB (0.96%) still require stronger asset management. Investment-to-Assets ratios indicate that public banks like SBI (31.31%) and BOB (27.93%) focus more on risk-free investments, while private banks like HDFC (24.96%) and Kotak Mahindra (32.10%) maintain a balanced strategy (Refer Table 4 & 5).

3.3 Management Efficiency

Table 6 Management Efficiency Ratios of Private Banks

Ratios	Year	Axis	HDFC	ICICI	IndusInd	Kotak
Credit to Deposit Ratio (%)	2024	93.64	107.96	87.36	89.31	96.65
	2023	91.80	88.28	89.56	86.29	99.40
	2022	88.36	91.18	84.36	81.52	98.19
	2021	89.74	88.89	82.46	83.09	90.47
	2020	90.79	91.07	88.19	102	95.97
Cost to Income Ratio (%)	2024	48.62	59.98	60.39	47.14	63.99
	2023	65.69	40.62	60.78	44.04	62.62
	2022	48.51	36.96	62.86	41.55	64.84
	2021	41.74	36.22	64.27	40.71	62.54
	2020	42.97	38.92	68.04	43.04	59.44
Return on Net Worth (%)	2024	16.99	16.86	17.99	14.47	13.95
	2023	13.38	9.79	16.47	13.81	13.34
	2022	12.06	14.81	14.55	10.23	12.47
	2021	7.04	8.70	13.30	6.91	11.88
	2020	2.19	2.86	9.47	13.49	13.10

Table 7 Management Efficiency Ratios of Public Banks

Ratios	Year	SBI	PNB	BOB	Canara	Union
Credit to Deposit Ratio (%)	2024	76.21	68.26	80.57	70.99	76.19
	2023	73.10	64.91	78.06	70.45	73.13
	2022	68.36	63.54	74.11	64.78	68.36
	2021	67.27	61.00	72.61	63.26	67.30
	2020	72.51	67.13	72.58	69.10	72.52
Cost to Income Ratio (%)	2024	51.67	48.98	48.66	44.94	43.88
	2023	54.24	50.54	49.94	45.85	44.55
	2022	53.31	49.68	51.4	47.4	46.06
	2021	53.25	50.98	52.36	47.73	45.2
	2020	54.16	48.71	51.55	50.02	46.24
Return on Net Worth (%)	2024	17.63	8.34	15.51	18.21	16.28
	2023	17.13	3.33	14.12	15.72	12.83
	2022	12.92	4.16	8.48	9.71	8.80
	2021	9.67	2.58	1.79	5.51	5.30
	2020	8.03	0.63	1.25	-5.98	-11.14

Result: Private banks demonstrate higher management efficiency, particularly in lending and profitability. HDFC Bank (107.96%) and Kotak Mahindra Bank (96.65%) have high credit-to-deposit (CD) ratios, reflecting aggressive loan growth, while SBI (76.21%) and BOB (80.57%) maintain a balanced lending approach. PNB (68.26%) and Canara Bank (70.99%) have lower CD ratios, indicating a more conservative strategy. In terms of cost-to-income (C/I) ratio, Axis Bank (48.62%) and HDFC Bank (59.98%) operate efficiently, while Union Bank (43.85%) and Canara Bank (44.94%) show improved cost control. Return on net worth (RoNW) highlights higher profitability in private banks, with HDFC (16.86%) and Axis (16.99%) outperforming public banks. SBI (13.95%) leads among public sector banks, while Union Bank (-11.14%) and Canara Bank (-5.98%) struggled in 2020 but have improved over time (Refer Table 6 & 7).

3.4 Earnings Quality

Table 8 Earnings Ratio of Private Banks

Ratios	Year	Axis	HDFC	ICICI	IndusInd	Kotak
Operating Profit Margin (%)	2024	72.99	62.67	58.58	74.33	51.33
	2023	61.18	74.84	55.71	74.51	50.63
	2022	71.17	75.96	53.58	75.65	47.87
	2021	76.29	77.55	52.71	76.98	51.75
	2020	77.43	77.55	52.25	77.1	59.31
ROE (%)	2024	16.99	14.46	17.99	14.47	13.94
	2023	8.43	15.98	16.48	13.81	13.34
	2022	12.06	15.46	14.55	10.23	12.47
	2021	7.04	15.22	13.31	6.91	11.88
	2020	2.19	15.53	9.47	13.49	13.10
ROI (%)	2024	7.95	6.51	5.44	8.42	7.29
	2023	3.77	9.02	5.39	7.84	7.57
	2022	5.16	8.49	4.55	7.11	7.25
	2021	3.22	7.26	3.8	6.55	6.31
	2020	1.21	7.01	2.53	5.85	7.74

Table 9 Earnings Ratio of Public Banks

Ratios	Year	SBI	PNB	BOB	Canara	Union
Operating Profit Margin (%)	2024	60.32	76.46	75.79	73.17	77.58
	2023	59.89	75.44	72.34	72.80	75.80
	2022	57.14	76.80	71.71	70.37	75.91
	2021	60.96	78.40	74.04	69.80	76.27
	2020	64.19	81.10	77.41	73.90	81.08
ROE (%)	2024	17.63	15.51	16.28	8.34	18.21
	2023	17.13	14.12	12.83	3.33	15.72
	2022	12.92	8.48	8.80	4.16	9.71
	2021	9.67	1.79	5.30	2.58	5.51
	2020	8.03	1.25	-11.14	0.63	-5.98
ROI (%)	2024	3.23	1.87	4.52	3.70	3.99
	2023	2.96	0.74	3.69	3.06	2.45
	2022	2.04	0.95	2.22	1.74	1.48
	2021	1.52	0.85	0.52	0.94	0.83
	2020	1.48	0.14	0.32	-1.05	-1.97

Result: Public banks like PNB (76.46%), BOB (75.79%), and Union Bank (77.58%) have higher operating profit margins, reflecting strong cost efficiency. Private banks such as HDFC (62.67%) and Axis (72.99%) also maintain high profitability, while Canara Bank (73.17%) and SBI (60.32%) show stable performance. Operating margins have remained consistent over the years, with minor fluctuations. ICICI Bank (17.99%) and Axis Bank (16.99%) lead in return on equity (ROE), demonstrating strong shareholder value creation. SBI (17.63%) and Union Bank (18.12%) have significantly improved, while HDFC (14.46%) and Kotak Mahindra (13.94%) maintain steady ROE. Union Bank made a remarkable turnaround from -5.98% in 2020 to 18.12% in 2024. In terms of return on investment (ROI), Axis Bank (7.95%), HDFC Bank (6.51%), and SBI (7.29%) show the highest returns, while Union Bank recovered from -1.97% in 2020 to 18.12% in 2024. PNB (1.87%) and Canara Bank (3.06%) still lag in investment efficiency, requiring further improvement (Refer Table 8 & 9).

3.5 Liquidity

Table 10 Liquidity Ratios of Private Banks

Ratio	Year	Axis	HDFC	ICICI	IndusInd	Kotak
Liquid Asset to Total Asset (%)	**2024**	24.25	21.94	27.46	36.68	49.78
	2023	24.51	25.14	28.71	36.70	35.88
	2022	28.23	24.66	29.89	33.72	29.06
	2021	25.06	26.29	27.65	26.66	25.04
	2020	24.03	26.06	28.61	17.38	18.76
Liquid Asset to Total Deposit (%)	**2024**	34.20	37.19	46.85	23.28	32.35
	2023	35.63	33.79	44.72	36.31	43.00
	2022	41.11	33.59	48.00	46.20	51.22
	2021	35.00	35.47	47.05	52.06	61.62
	2020	35.04	35.93	47.23	55.78	84.71

Table 11 Liquidity Ratios of Public Banks

Ratio	Year	SBI	PNB	BOB	Canara	Union
Liquid Asset to Total Asset (%)	**2024**	32.48	33.52	27.07	30.93	29.66
	2023	31.94	31.43	28.99	31.41	30.48
	2022	30.21	30.65	31.83	30.82	31.22
	2021	29.54	29.17	31.02	29.99	28.56
	2020	27.83	28.52	32.45	28.46	27.43
Liquid Asset to Total Deposit (%)	**2024**	16.17	18.21	37.54	20.91	19.36
	2023	18.14	19.02	40.16	22.34	20.08
	2022	22.64	21.37	38.78	24.01	22.71
	2021	24.87	23.01	36.63	26.27	25.02
	2020	28.07	25.08	33.84	29.51	26.78

Source: Annual Report of Banks, RBI Website

Result: Private banks generally maintain stronger liquidity buffers compared to public banks. Kotak Mahindra Bank (49.78%) and IndusInd Bank (36.68%) have higher liquid asset-to-total asset ratios, ensuring resilience against short-term obligations. SBI (32.48%) and PNB (33.52%) also hold stable liquidity positions, while BOB (27.07%) and Union Bank (29.66%) are on the lower side, indicating moderate liquidity risk. HDFC Bank (21.94%) has the lowest ratio among private banks, suggesting a need for improved liquidity management. In terms of liquid asset-to-total deposit ratio, ICICI Bank (46.85%) and Axis Bank (34.20%) maintain strong liquidity to cover deposit

withdrawals, whereas public banks like SBI (16.17%) and PNB (18.21%) have relatively lower ratios, showing potential withdrawal risks. BOB (37.54%) has improved, but Union Bank (19.36%) remains at the lowest level, indicating higher liquidity concerns. While private banks like Kotak and ICICI maintain a well-balanced liquidity position, public banks may need to strengthen their liquidity management strategies (Refer Table 9 & 10).

4. Discussion

The results indicate that private banks maintain a stronger financial position due to their higher capital adequacy, better management efficiency, and improved liquidity. Their ability to sustain lower debt-to-equity ratios and higher credit-to-deposit ratios reflects their aggressive yet well-managed lending strategies. This suggests that private banks are more adaptable to regulatory requirements and market demands, ensuring stability while expanding their loan portfolios. Public banks, while showing improvements in profitability, continue to face challenges in asset quality and operational efficiency. Their relatively lower liquidity ratios indicate a more conservative approach, focusing on maintaining stability rather than rapid expansion. The improving trends in return on equity and investment suggest that some public banks have adopted better financial management strategies in recent years. However, their slower pace of efficiency enhancement highlights the need for stronger risk management practices and operational restructuring to remain competitive.

Conclusion

The analysis confirms that private banks maintain stronger financial health compared to public banks, particularly in capital adequacy, management efficiency, and profitability**.** Their higher CAR, lower D/E ratios, and aggressive lending strategies indicate better financial stability and growth potential**.** Public banks, while showing improvements in asset quality and liquidity, still face challenges in profitability and operational efficiency**.** The discussion highlights that private banks consistently outperform in risk management, return on equity, and investment efficiency, while public banks adopt a more conservative approach**,** focusing on stability rather than rapid expansion**.** The trends suggest that public sector banks need stronger financial restructuring to remain competitive, whereas private banks must balance growth with risk control to ensure sustainable expansion**.**

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