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A Comparative Study of Financial Performance of Selected Public Sector Banks (PSB) Using Camel Model

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A B S T R A C T

Public Sector Banks (PSBs) play a pivotal role in India's economy, commanding a significant share of the financial market and influencing the nation's financial stability. This study evaluates the financial performance of four leading PSBs—State Bank of India (SBI), Bank of Baroda (BOB), Punjab National Bank (PNB), and Union Bank of India (UBI)—using the CAMEL model. The CAMEL framework examines five key components: Capital Adequacy, Asset Quality, Management Quality, Earnings Quality, and Liquidity. By analyzing these parameters through key financial ratios, the study provides a comparative assessment and ranks the banks based on their financial health and operational efficiency. Data sourced from annual reports and regulatory publications ensures a robust and reliable evaluation.

The findings reveal that Bank of Baroda (BOB) stands out as the top performer, excelling in asset quality and liquidity management. State Bank of India (SBI) demonstrates notable strengths in earnings quality and asset quality, though its liquidity management requires attention. Punjab National Bank (PNB) faces significant challenges, particularly with non-performing assets and maintaining financial stability, while Union Bank of India (UBI) shows moderate performance but has opportunities to improve operational efficiency. The study emphasizes the importance of addressing challenges in capital adequacy, improving asset quality, and managing liquidity strategically to ensure the stability and growth of PSBs. These insights provide actionable guidance for bank management, policymakers, and investors, helping strengthen the resilience and competitiveness of India's public banking sector.

Keywords: CAMEL Model, Financial Performance, Public Sector Banks, Capital Adequacy, Asset Quality, Management Quality, Earnings Quality, Liquidity, Comparative Analysis, Market Capitalization.

1. Introduction

Introduced in the United States in 1979 by regulatory authorities like the Federal Reserve, FDIC, and OCC, the CAMEL model was designed to assess the soundness of banks. It provides ratings on a scale from 1 to 5, with 1 indicating strong performance and 5 indicating critical weaknesses. Over time, the model's simplicity and effectiveness led to global acceptance, influencing banking oversight worldwide. The Basel Accords (I, II, III, and ongoing IV) further aligned aspects like capital adequacy and liquidity with CAMEL's objectives, expanding its application to international financial systems.

In the early 1990s, the Reserve Bank of India (RBI) adopted the CAMEL framework as part of banking sector reforms during economic liberalization. Initially applied to scheduled commercial banks, it was later extended to regional rural and cooperative banks. CAMEL became integral to the RBI's supervisory framework, evaluating non-performing assets (NPAs), governance, and capital adequacy. Over time, it merged into the RBI's Risk-Based Supervision (RBS) model, addressing emerging challenges such as compliance with Basel III norms and liquidity management. CAMEL remains a cornerstone of financial regulation and stability in India's diverse banking landscape. Financial Performance Analysis evaluates a bank's profitability and financial health using techniques like ratio analysis to reveal its true financial position.

2. Literature Review

(Birhanie, 2020) This study assesses the financial performance of selected private banks in Ethiopia (2017–2019) using the CAMEL framework, focusing on capital adequacy, asset quality, management efficiency, earning quality, and liquidity. Based on ratio analysis, Addis International Bank excels in capital adequacy and management efficiency, while Awash International Bank leads in asset quality and earning quality. Abay Bank outperforms others in liquidity. The findings highlight the varying strengths of the banks, with Addis International Bank being the most consistent performer across multiple parameters. The study underscores the diverse financial capabilities of Ethiopian private banks.

(Vinod Kumar, 2017) This study evaluates the performance and financial soundness of selected private banks in India from 2007 to 2017 using the CAMEL framework. Through comparative analysis using Composite Rankings, Average, and Covariance, the research ranks the banks based on their financial strength. Axis Bank emerges as the top performer, followed by ICICI Bank and Kotak Mahindra Bank. HDFC Bank ranks fourth, and IndusInd Bank occupies the last position among the selected banks. The findings provide a clear comparative assessment of the financial soundness of these private banks over the study period.

(Dr. Mohi-ud-Din Sangmi, 2010)This study evaluates the financial performance of two major banks in northern India using the CAMEL framework. The analysis highlights that the banks demonstrate sound and satisfactory performance in capital adequacy, asset quality, management capability, and liquidity. These findings indicate the financial stability of the banks, ensuring reliability for stakeholders and underscoring the importance of effective financial management in maintaining the health of the banking sector.

(Sarit Biswas, 2020)This study evaluates the performance of ten new-generation private banks in India using the CAMEL model over five years (2014-15 to 2018-19). It employs key financial ratios and data from MoneyControl and bank annual reports to compare performance. The findings reveal Bandhan Bank as the top performer, followed by HDFC Bank. A one-way ANOVA indicates significant variations in performance across the banks. The study highlights the evolving dynamics in India's banking sector and offers valuable insights for stakeholders' decision-making.

(Hari Krishna Karri, 2015)This study analyzes the financial position and performance of Bank of Baroda and Punjab National Bank using the CAMEL model and t-test. It evaluates key parameters like capital adequacy, asset quality, management efficiency, earning quality, liquidity, and sensitivity. The study aims to measure and compare the relative performance of these public sector banks in India.

(Meena, 2016)This study evaluates the financial performance of selected public and private sector banks in India using the CAMEL approach, focusing on capital adequacy, asset quality, management capability, earnings capacity, and liquidity. It identifies four key factors—profit per employee, debt-equity ratio, total assets-to-total deposits ratio, and Net NPA-to-total advances ratio—as major influences on the banks' financial performance, with return on assets as the independent variable.

(Anh Huu Nguyen, 2020)This study examines the impact of CAMEL components on the financial performance of commercial banks in Vietnam. Using econometric models, it analyzes four key indicators—capital adequacy, asset quality, management effectiveness, and liquidity—against performance metrics like ROA, ROE, and NIM. The results show that capital adequacy, asset quality, liquidity, and management efficiency significantly affect the financial performance of Vietnamese banks, with the fixed effects model providing the best fit for the data.

3. Objectives of Research

- To explore the applicability of the CAMEL model in evaluating the financial performance of public sector banks.
- To assess the financial soundness of selected public sector banks across multiple dimensions, including Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, and Liquidity.
- To conduct a comparative analysis of the selected banks to understand their operational efficiency and financial stability.
- To identify areas of strength and potential improvement within the selected public sector banks.
- To analyze trends and patterns in financial performance over a defined period for a comprehensive understanding of the banking sector's dynamics**.**

4. Research Methodology

Research Design*:* This study is analytical in nature and uses the CAMEL model to evaluate and compare the financial performance of selected public sector banks. It primarily relies on secondary data for analysis.

Data Collection: The data has been collected from the annual reports and financial statements of the selected banks. Additional sources include reports from regulatory bodies such as RBI, financial research publications, and websites such as Moneycontrol and Screener. These sources ensure the reliability and comprehensiveness of the data used in the analysis.

Sr. no	Bank	Market Cap (Rs Lakh Crore)
1	State Bank of India	748820.26
2	Bank of Baroda	127345.65
3	Punjab National Bank	120572.31
4	Indian Overseas Bank	101751.68
5	Union Bank of India	92946.85
6	Canara Bank	92439.88

7	Indian Bank	77383.15
8	UCO Bank	53215.61
9	Bank of India	50284.51
10	Central Bank of India	48440.03

Sample Selection: The study employs a purposive sampling approach. From the top 10 public sector banks in India by market capitalization, the following four banks were selected:

1. State Bank of India (SBI): The largest public sector bank in India.
2. Bank of Baroda (BOB): One of the leading banks with significant market share and operational efficiency.
3. Punjab National Bank (PNB): A prominent public sector bank with a diverse customer base.
4. Union Bank of India (UBI): A growing bank with strong regional presence.

The selection is based on market capitalization, financial standing, and their representation of the diversity within the public banking sector.

Bank Ranking: The selected banks are ranked based on their performance across the five CAMEL parameters. Each parameter is analyzed using a set of ratios, and a consolidated ranking is calculated to compare the overall performance. This methodology ensures a balanced and comprehensive assessment of each bank's financial health and operational efficiency

5. Conceptual Framework

The CAMEL model, an acronym for Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, and Liquidity, is a widely utilized framework for evaluating the overall performance and financial soundness of banks. This systematic rating approach helps regulators, investors, and analysts gauge the stability and operational efficiency of financial institutions, offering insights into key operational areas.

The CAMEL Model is employed in this study to assess performance, focusing on critical ratios that highlight strengths, weaknesses, and areas for improvement, providing insights for enhancing future operations.

Following financial ratios under CAMEL Model have been used for the analysis of Financial Performance :

C	**Capital Adequacy**	Capital Adequacy Ratio
		Debt Equity Ratio
A	**Asset Quality**	Net NPA to Total asset
		Total investment to total asset
		Net NPA’s to Total Advances
M	**Management Quality**	Total Advances to Total Deposits Ratio
		Profit Per Employee
		Business Per Employee
		Return on Net Worth
E	**Earnings Quality**	Return on asset
		Net Profit to Assets
		Cost to income
		Percentage Change in Net Profit
L	**Liquidity**	Government Securities to Total Assets
		Liquid Assets to Total Assets
		Liquid Assets to Total Deposits
		Liquid Assets to Demand Deposits

6. Data Analysis

6.1 Capital Adequacy Ratios

Table – 1 Capital Adequacy Ratio (CAR)

The Capital Adequacy Ratio (CAR) measures a bank's capital against its risk-weighted assets, indicating its ability to absorb losses. A higher CAR reflects a stronger financial position, ensuring stability and solvency, especially for public sector banks managing public funds.

Years	SBI	BOB	PNB	UBI
2019-20	13.06	13.30	14.14	12.81
2020-21	13.74	14.99	14.32	12.56
2021-22	13.83	15.68	14.50	14.52
2022-23	14.68	16.24	15.50	16.04
2023-24	14.28	16.31	15.97	16.97
Average	**13.92**	**15.30**	**14.89**	**14.58**
Rank	**4**	**1**	**2**	**3**

Over the five-year period, Bank of Baroda (BOB) ranks first with the highest average CAR of 15.30, followed by Punjab National Bank (PNB) in second and Union Bank of India (UBI) in third. State Bank of India (SBI) ranks fourth with the lowest average CAR of 13.92. BOB's stable and higher CAR reflects its strong capital position, while SBI's fluctuating and lower CAR indicates weaker capital management.

Table -2 Debt Equity Ratio (DER)

The Debt Equity Ratio (DER) measures the proportion of a bank's debt to its equity, indicating the bank's financial leverage. A higher ratio suggests that a bank is more reliant on debt to finance its operations, which can increase financial risk. Conversely, a lower ratio indicates a more balanced or conservative approach, with a greater reliance on equity. In banking, maintaining a healthy DER is important to ensure the bank can meet its obligations without over-leveraging, while still having enough equity to support growth.

Years	SBI	BOB	PNB	UBI
2019-20	1.330	1.260	0.979	1.550
2020-21	1.570	0.865	0.565	0.802
2021-22	1.470	1.190	0.608	0.723
2022-23	1.450	1.030	0.682	0.542
2023-24	1.490	0.845	0.766	0.278
Average	**1.462**	**1.038**	**0.720**	**0.779**
Rank	**4**	**3**	**1**	**2**

Over the five-year period, Punjab National Bank (PNB) ranks first with the lowest average DER of 0.720, followed by Union Bank of India (UBI) in second with 0.779. Bank of Baroda (BOB) ranks third with an average DER of 1.038, and State Bank of India (SBI) ranks fourth with the highest average DER of 1.462. PNB's lower DER reflects a more conservative approach to leverage, while SBI's higher ratio indicates a greater reliance on debt to finance its operations.

Table -3 Overall Ranking of Capital Adequacy

Ratios	SBI	BOB	PNB	UBI
Capital Adequacy Ratio	4	1	2	3
Debt Equity Ratio	4	3	1	2
Average of Ranks	**4**	**2**	**1.5**	**2.5**

Based on the overall ranking of the Capital Adequacy component, Punjab National Bank (PNB) emerges as the strongest performer with an average rank of 1.5, reflecting its robust capital position and prudent financial leverage. Bank of Baroda (BOB) follows closely with an average rank of 2, indicating consistent capital management. Union Bank of India (UBI), with an average rank of 2.5, shows satisfactory performance but lags slightly behind the leaders. State Bank of India (SBI) ranks the lowest with an average of 4, highlighting the need for improvement in its capital adequacy and leverage metrics to strengthen its overall financial stability.

6.2 Asset Quality Ratios

Table -4 Net NPA to Total Assets

The Net NPA to Total Assets ratio measures the proportion of non-performing assets (NPAs) in relation to a bank's total assets, indicating the level of asset quality. A lower ratio indicates better asset quality, as it reflects fewer NPAs, meaning the bank’s loans are more likely to be repaid. In the banking context, maintaining a low NPA ratio is crucial for financial stability and profitability, as higher NPAs can affect a bank's liquidity and solvency.

Years	SBI	BOB	PNB	UBI
2019-20	1.31%	1.80%	3.20%	3.11%
2020-21	0.81%	1.81%	3.01%	2.52%
2021-22	0.56%	1.00%	2.61%	2.04%
2022-23	0.39%	0.55%	1.51%	1.00%
2023-24	0.34%	0.44%	0.44%	0.64%
Average	**0.68%**	**1.12%**	**2.15%**	**1.86%**
Rank	**1**	**2**	**4**	**3**

Over the five-year period, State Bank of India (SBI) ranks first with the lowest average ratio of 0.68%, followed by Bank of Baroda (BOB) in second place with 1.12%. Union Bank of India (UBI) ranks third with an average ratio of 1.86%, while Punjab National Bank (PNB) ranks fourth with the highest average ratio of 2.15%. SBI’s consistently low NPA ratio reflects strong asset quality, while PNB's higher ratio indicates more challenges in managing non-performing assets.

Table -5 Total Investments to Total Assets

The Total Investment to Total Asset ratio measures the proportion of a bank’s assets that are invested, indicating how much of the bank's total assets are allocated to investments. A higher ratio suggests a greater reliance on investments for generating returns, while a lower ratio indicates more assets are tied up in non-investment activities. In banking, maintaining a balanced investment strategy is key to ensuring profitability and liquidity while minimizing risk exposure.

Years	SBI	BOB	PNB	UBI
2019-20	26.50%	24.15%	29.81%	27.77%
2020-21	29.81%	23.44%	31.60%	31.33%
2021-22	29.70%	25.94%	29.01%	29.47%
2022-23	28.46%	26.05%	27.91%	26.68%
2023-24	27.05%	24.60%	27.93%	24.53%
Average	**28.30%**	**24.83%**	**29.25%**	**27.96%**
Rank	**3**	**1**	**4**	**2**

Over the five-year period, State Bank of India (SBI) ranks third with an average ratio of 28.30%, followed by Union Bank of India (UBI) in second with 27.96%. Bank of Baroda (BOB) ranks first with the lowest average ratio of 24.83%, indicating a more conservative approach to investments. Punjab National Bank (PNB) ranks fourth with the highest average ratio of 29.25%, reflecting a greater reliance on investments to generate returns.

Table -6 Net NPAs to Total Advances

The Net NPA's to Total Advances ratio measures the proportion of non-performing assets (NPAs) in relation to a bank's total advances, reflecting the quality of the bank's loan portfolio. A lower ratio indicates a higher quality of advances, as fewer loans are non-performing. In banking, maintaining a low ratio is crucial for ensuring financial health and liquidity, as higher NPAs can reduce profitability and create financial instability.

Years	SBI	BOB	PNB	UBI
2019-20	2.23%	3.05%	5.71%	5.45%
2020-21	1.50%	3.01%	5.68%	4.60%
2021-22	1.02%	1.68%	4.76%	3.66%
2022-23	0.67%	0.87%	2.70%	1.69%
2023-24	0.57%	0.66%	0.74%	1.03%
Average	**1.20%**	**1.86%**	**3.92%**	**3.29%**
Rank	**1**	**2**	**4**	**3**

Over the five-year period, State Bank of India (SBI) ranks first with the lowest average ratio of 1.20%, followed by Bank of Baroda (BOB) in second place with 1.86%. Union Bank of India (UBI) ranks third with an average ratio of 3.29%, while Punjab National Bank (PNB) ranks fourth with the highest average ratio of 3.92%. SBI's consistently low NPA ratio reflects strong asset management, while PNB's higher ratio indicates more challenges with non-performing advances.

Table -7 Overall Ranking of Asset Quality

Ratios	SBI	BOB	PNB	UBI
Net NPA to Total asset	1	2	4	3
Total investment to total asset	3	1	4	2
Net NPA's to Total Advances	1	2	4	3
Average of Ranks	**1.67**	**1.67**	**4**	**2.67**

Based on the overall ranking of Asset Quality, State Bank of India (SBI) and Bank of Baroda (BOB) share the top position with an average rank of 1.67, reflecting their effective management of non-performing assets and strong asset quality. Union Bank of India (UBI) ranks third with an average of 2.67, indicating satisfactory but slightly weaker performance compared to the leaders. Punjab National Bank (PNB) holds the fourth position with an average rank of 4, suggesting significant challenges in managing its asset quality and a need for focused improvements.

6.3 Management Efficiency Ratios

Table -8 Total Advances to Total Deposits

The Total Advances to Total Deposits ratio measures the proportion of a bank's deposits that are extended as loans, indicating how efficiently the bank is utilizing its deposits for lending. A higher ratio suggests a more aggressive lending strategy, potentially offering higher returns, while a lower ratio may indicate a more conservative approach. In banking, balancing this ratio is essential to ensure adequate liquidity while maximizing profitability through lending.

Years	SBI	BOB	PNB	UBI
2019-20	71.73%	72.60%	67.14%	70.21%
2020-21	66.54%	72.62%	61.00%	64.10%
2021-22	67.48%	74.11%	63.57%	64.13%
2022-23	72.32%	78.05%	64.90%	68.22%
2023-24	75.34%	80.56%	68.28%	71.38%
Average	**70.68%**	**75.59%**	**64.98%**	**67.61%**
Rank	**2**	**1**	**4**	**3**

Over the five-year period, Bank of Baroda (BOB) ranks first with the highest average ratio of 75.59%, followed by State Bank of India (SBI) in second with 70.68%. Union Bank of India (UBI) ranks third with an average ratio of 67.61%, while Punjab National Bank (PNB) ranks fourth with the lowest average ratio of 64.98%. BOB's higher ratio reflects a more aggressive lending approach, while PNB's lower ratio indicates a more conservative lending strategy.

Table -9 Profit per Employee (In lakhs)

The Profit Per Employee ratio measures the average profit generated by each employee in the bank, reflecting the bank's efficiency in generating profits relative to its workforce. A higher ratio indicates better productivity and profitability per employee, suggesting a more efficient and effective organization. In banking, this ratio helps assess operational efficiency and the contribution of employees to the bank's overall profitability.

Years	SBI	BOB	PNB	UBI
2019-20	5.8	0.7	0.5	-7.8
2020-21	8.2	1.0	1.9	3.7
2021-22	12.9	9.1	3.4	7.0
2022-23	21.2	18.1	2.4	11.2
2023-24	26.2	23.6	8.1	18.0
Average	**14.9**	**10.5**	**3.2**	**6.4**
Rank	**1**	**2**	**4**	**3**

Over the five-year period, State Bank of India (SBI) ranks first with the highest average profit per employee of Rs 14.9 lakhs, followed by Bank of Baroda (BOB) in second with Rs 10.5 lakhs. Union Bank of India (UBI) ranks third with an average profit of Rs 6.4 lakhs, while Punjab National Bank (PNB) ranks fourth with the lowest average of Rs 3.2 lakhs. SBI's consistently high profit per employee reflects strong operational efficiency, while PNB's lower ratio suggests less efficient utilization of its workforce.

Table -10 Business Per Employee (in Crores)

The Business Per Employee ratio measures the total business (deposits plus advances) handled by each employee, reflecting the bank's productivity and operational scale. A higher ratio indicates that each employee is responsible for a larger volume of business, suggesting greater operational efficiency. In banking, maximizing business per employee is important for achieving economies of scale and improving profitability without significantly increasing workforce size.

Years	SBI	BOB	PNB	UBI
2019-20	8.44	18.77	18.21	20.06
2020-21	10.09	19.57	18.85	19.23
2021-22	10.76	22.05	19.41	20.48
2022-23	11.68	26.66	21.64	23.14
2023-24	12.98	30.46	23.84	25.37
Average	**10.79**	**23.502**	**20.39**	**21.656**
Rank	**4**	**1**	**3**	**2**

Over the five-year period, Bank of Baroda (BOB) ranks first with the highest average business per employee of Rs 23.50 crores, followed by Union Bank of India (UBI) in second with Rs 21.66 crores. Punjab National Bank (PNB) ranks third with an average of Rs 20.39 crores, while State Bank of India (SBI) ranks fourth with the lowest average ratio of Rs 10.79 crores. BOB's higher ratio reflects greater business efficiency per employee, while SBI's lower ratio indicates more focused business per employee.

Table -11 Return on Net Worth

The Return on Net Worth (RoNW) ratio measures the profitability of a bank in relation to its shareholders' equity, indicating how efficiently the bank is utilizing its equity capital to generate profits. A higher RoNW signifies better profitability, meaning the bank is generating more return for its shareholders. In banking, maintaining a strong RoNW is important for attracting investors and ensuring sustainable growth.

Years	SBI	BOB	PNB	UBI
2019-20	7.74%	1.23%	0.59%	-12.52%
2020-21	9.94%	1.50%	3.88%	6.68%
2021-22	13.92%	11.86%	5.96%	10.11%
2022-23	19.43%	18.34%	3.94%	13.26%
2023-24	20.32%	18.95%	11.66%	15.58%
Average	**14.27%**	**10.38%**	**5.21%**	**6.62%**
Rank	**1**	**2**	**4**	**3**

Over the five-year period, State Bank of India (SBI) ranks first with the highest average RoNW of 14.27%, followed by Bank of Baroda (BOB) in second place with 10.38%. Union Bank of India (UBI) ranks third with an average of 6.62%, while Punjab National Bank (PNB) ranks fourth with the lowest average of 5.21%. SBI's consistently strong RoNW reflects superior profitability, while PNB's lower ratio highlights weaker return generation for its equity investors.

Table -12 Overall Ranking of Management Quality

Ratios	SBI	BOB	PNB	UBI
Total Advances to Total Deposits Ratio	2	1	4	3
Profit Per Employee	1	2	4	3
Business Per Employee	4	1	3	2
Return on Net Worth	1	2	4	3
Average of Ranks	**2**	**1.5**	**3.75**	**2.75**

Based on the overall ranking of Management Quality, Bank of Baroda (BOB) ranks first with an average score of 1.5, showcasing its superior efficiency in utilizing resources and generating returns. State Bank of India (SBI) secures the second position with an average rank of 2, reflecting strong but slightly less consistent management performance. Union Bank of India (UBI) holds the third spot with an average rank of 2.75, indicating moderate efficiency and scope for improvement. Punjab National Bank (PNB) ranks last with an average of 3.75, highlighting challenges in operational efficiency and profitability metrics.

6.4 Earnings Ratios

Table -13 Return on asset

The Return on Assets (RoA) ratio measures a bank's ability to generate profit from its total assets, indicating its overall efficiency in utilizing assets to produce earnings. A higher RoA shows better asset utilization, meaning the bank is earning more profit per unit of asset. In banking, a strong RoA is important for ensuring that the bank can maintain profitability while managing its assets effectively.

Years	SBI	BOB	PNB	UBI
2019-20	0.38%	0.05%	0.04%	-0.53%
2020-21	0.48%	0.07%	0.15%	0.27%
2021-22	0.67%	0.57%	0.26%	0.47%
2022-23	0.96%	0.97%	0.18%	0.69%
2023-24	1.04%	1.12%	0.54%	1.03%
Average	**0.71%**	**0.56%**	**0.23%**	**0.39%**
Rank	**1**	**2**	**4**	**3**

Over the five-year period, State Bank of India (SBI) ranks first with the highest average RoA of 0.71%, followed by Bank of Baroda (BOB) in second with 0.56%. Union Bank of India (UBI) ranks third with an average of 0.39%, while Punjab National Bank (PNB) ranks fourth with the lowest average of 0.23%. SBI's superior RoA reflects better asset utilization and profitability, while PNB's lower RoA indicates less efficient asset management.

Table -14 Net Profit to Assets

The Net Profit to Assets ratio measures the proportion of a bank's profit in relation to its total assets, reflecting the bank's efficiency in generating profit from its asset base. A higher ratio indicates better profitability relative to the bank's asset size, signaling effective asset management and operational efficiency. In banking, this ratio helps assess how well the bank is converting its assets into profits.

Years	SBI	BOB	PNB	UBI
2019-20	0.36%	0.04%	0.04%	-0.52%
2020-21	0.45%	0.07%	0.16%	0.27%
2021-22	0.63%	0.56%	0.26%	0.44%
2022-23	0.91%	0.96%	0.17%	0.65%
2023-24	0.98%	1.12%	0.52%	0.98%
Average	**0.67%**	**0.55%**	**0.23%**	**0.36%**
Rank	**1**	**2**	**4**	**3**

Over the five-year period, State Bank of India (SBI) ranks first with the highest average Net Profit to Assets ratio of 0.67%, followed by Bank of Baroda (BOB) in second place with 0.55%. Union Bank of India (UBI) ranks third with an average of 0.36%, while Punjab National Bank (PNB) ranks fourth with the lowest average of 0.23%. SBI's higher ratio reflects stronger profitability from its assets, while PNB's lower ratio signals less efficient profit generation from its assets.

Table -15 Cost to income

The Cost to Income ratio measures a bank's operating efficiency by comparing its operating costs to its income. A lower ratio indicates that the bank is more efficient, spending less to generate income, while a higher ratio suggests higher operational expenses relative to income. In banking, managing costs is essential to ensure profitability and maintain financial health.

Years	SBI	BOB	PNB	UBI
2019-20	52.46%	49.97%	44.82%	45.02%
2020-21	53.60%	49.22%	47.82%	46.54%
2021-22	53.31%	49.24%	49.38%	45.74%
2022-23	53.87%	47.72%	51.69%	46.27%
2023-24	55.66%	47.71%	53.37%	46.42%
Average	**53.78%**	**48.77%**	**49.42%**	**46.00%**
Rank	**4**	**2**	**3**	**1**

Over the five-year period, Union Bank of India (UBI) ranks first with the lowest average Cost to Income ratio of 46.00%, indicating the highest operational efficiency. Bank of Baroda (BOB) ranks second with 48.77%, followed by Punjab National Bank (PNB) in third with 49.42%. State Bank of India (SBI) ranks fourth with the highest average ratio of 53.78%, suggesting it has higher costs relative to its income compared to the other banks. UBI's lower ratio reflects better cost management and operational efficiency.

Table -16 Percentage Change In Net Profit

The Percentage Change in Net Profit measures the annual growth or decline in a bank's net profit compared to the previous year. A positive percentage indicates profit growth, while a negative percentage suggests a reduction in profitability. This ratio helps assess a bank’s financial performance and its ability to maintain or improve profitability over time.

Years	SBI	BOB	PNB	UBI
2019-20	1580%	26%	-103%	-2%
2020-21	41%	52%	501%	-200%
2021-22	55%	777%	71%	80%
2022-23	59%	94%	-27%	61%
2023-24	22%	26%	229%	62%
Average	**351%**	**195%**	**134%**	**0%**
Rank	**1**	**2**	**3**	**4**

Over the five-year period, State Bank of India (SBI) ranks first with an impressive average percentage change of 351.31%, reflecting substantial profit growth in most years. Bank of Baroda (BOB) ranks second with an average of 195.03%, showing consistent profit increases. Punjab National Bank (PNB) ranks third with 134.07%, experiencing some significant fluctuations in profit changes. Union Bank of India (UBI) ranks fourth with an average of just 0.22%, indicating minimal overall profit growth over the period. SBI's significant profit growth outshines its peers, while UBI’s small change reflects weaker financial performance.

Table -17 Overall Ranking of Earnings Quality

Ratios	SBI	BOB	PNB	UBI
Return on asset	1	2	4	3
Net Profit to Assets	1	2	4	3
Cost to income	4	2	3	1
Percentage Change in Net Profit	1	2	3	4
Average of Ranks	**1.75**	**2**	**3.5**	**2.75**

Based on the overall ranking of Earnings Quality, State Bank of India (SBI) leads with an average rank of 1.75, reflecting its strong profitability and efficient asset utilization. Bank of Baroda (BOB) follows closely in the second position with an average rank of 2, indicating consistent earnings performance. Union Bank of India (UBI) ranks third with an average of 2.75, demonstrating moderate efficiency but room for improvement. Punjab

National Bank (PNB) ranks fourth with an average of 3.5, highlighting weaker profitability metrics and the need for focused strategies to enhance earnings quality.

6.5 Liquidity Ratios

Table -18 Government Securities to Total Assets

The Government Securities to Total Assets ratio indicates the proportion of a bank's assets that are invested in government securities. A higher percentage suggests that the bank holds a significant portion of its assets in safe and low-risk government bonds, which can provide stability during market fluctuations. In banking, this ratio reflects the bank's strategy in managing its risk profile and liquidity.

Years	SBI	BOB	PNB	UBI
2019-20	22.61%	20.68%	27.91%	19.31%
2020-21	25.62%	19.03%	27.70%	22.33%
2021-22	25.77%	20.85%	25.32%	22.26%
2022-23	25.23%	21.03%	25.01%	20.50%
2023-24	25.15%	19.92%	24.85%	19.81%
Average	**24.88%**	**20.30%**	**26.16%**	**20.84%**
Rank	**2**	**4**	**1**	**3**

Over the five-year period, Punjab National Bank (PNB) ranks first with the highest average of 26.16%, indicating a strong investment in government securities. State Bank of India (SBI) ranks second with 24.88%, showing a significant but slightly lower allocation to government securities. Union Bank of India (UBI) ranks third with 20.84%, while Bank of Baroda (BOB) ranks fourth with 20.30%. PNB's higher allocation to government securities suggests a more conservative and secure approach compared to its peers.

Table -19 Liquid Assets to Total Assets

The Liquid Assets to Total Assets ratio measures the proportion of a bank's total assets that are held in liquid assets, such as cash, marketable securities, and short-term investments. A higher ratio indicates that a bank has more liquidity, allowing it to cover short-term obligations and meet unexpected demands. In the banking sector, maintaining a solid liquidity position is vital for stability and risk management.

Years	SBI	BOB	PNB	UBI
2019-20	6.44%	10.92%	9.13%	9.95%
2020-21	7.67%	10.70%	8.86%	7.83%
2021-22	8.00%	9.72%	10.02%	10.03%
2022-23	5.77%	6.71%	10.53%	8.74%
2023-24	5.28%	6.06%	8.22%	8.53%
Average	**6.63%**	**8.82%**	**9.35%**	**9.02%**
Rank	**4**	**3**	**1**	**2**

Based on the average ratio over the five-year period, Punjab National Bank (PNB) ranks first with the highest average of 9.35%, indicating the strongest liquidity position. Union Bank of India (UBI) ranks second with 9.02%, followed closely by Bank of Baroda (BOB) with 8.82%. State Bank of India (SBI) ranks fourth with the lowest average of 6.63%, reflecting a relatively weaker liquidity position compared to its peers. PNB's higher liquid assets indicate a stronger buffer against potential liquidity shocks.

Table -20 Liquid Assets to Total Deposits

The Liquid Assets to Total Deposits ratio measures the proportion of a bank's total deposits that are held in liquid assets, indicating its ability to meet deposit withdrawals and other short-term liabilities. A higher ratio reflects stronger liquidity, providing a cushion for the bank to manage unexpected demands without jeopardizing its financial stability.

Years	SBI	BOB	PNB	UBI
2019-20	7.85%	13.46%	10.95%	12.21%
2020-21	9.45%	12.92%	10.18%	9.16%
2021-22	9.85%	12.11%	11.63%	11.58%
2022-23	7.20%	8.29%	12.19%	10.05%
2023-24	6.64%	7.42%	9.53%	9.77%
Average	**8.19%**	**10.84%**	**10.89%**	**10.55%**
Rank	**4**	**2**	**1**	**3**

Based on the average ratio over the five-year period, Punjab National Bank (PNB) ranks first with an average of 10.89%, showcasing the strongest liquidity among the banks. Bank of Baroda (BOB) ranks second with 10.84%, followed closely by Union Bank of India (UBI) with 10.55%. State Bank of India (SBI) ranks fourth with the lowest average of 8.19%, indicating relatively weaker liquidity compared to its competitors. PNB's higher liquidity position suggests better preparedness to handle short-term obligations.

Table -21 Liquid Assets to Demand Deposits

The Liquid Assets to Demand Deposits ratio measures the proportion of a bank's liquid assets relative to its demand deposits, reflecting its ability to meet sudden withdrawal demands by customers. A higher ratio indicates stronger liquidity, meaning the bank is better equipped to handle large, unexpected withdrawals without compromising its financial stability.

Years	SBI	BOB	PNB	UBI
2019-20	111%	198%	167%	209%
2020-21	120%	160%	148%	133%
2021-22	143%	143%	161%	165%
2022-23	104%	96%	208%	152%
2023-24	106%	82%	179%	162%
Average	**117%**	**136%**	**173%**	**164%**
Rank	**4**	**3**	**1**	**2**

Based on the average ratio over the five-year period, Punjab National Bank (PNB) ranks first with an average of 172.56%, reflecting its strong liquidity position. Union Bank of India (UBI) follows closely in second with 164.13%. Bank of Baroda (BOB) ranks third with 135.80%, while State Bank of India (SBI) ranks fourth with the lowest average of 116.67%. PNB and UBI's higher ratios indicate a better ability to meet demand deposits compared to SBI and BOB, with PNB leading the pack in terms of liquidity coverage.

Table -22 Overall Ranking of Liquidity

Ratios	SBI	BOB	PNB	UBI
Government Securities to Total Assets	2	4	1	3
Liquid Assets to Total Assets	4	3	1	2
Liquid Assets to Total Deposits	4	2	1	3
Liquid Assets to Demand Deposits	4	3	1	2
Average of Ranks	**3.5**	**3**	**1**	**2.5**

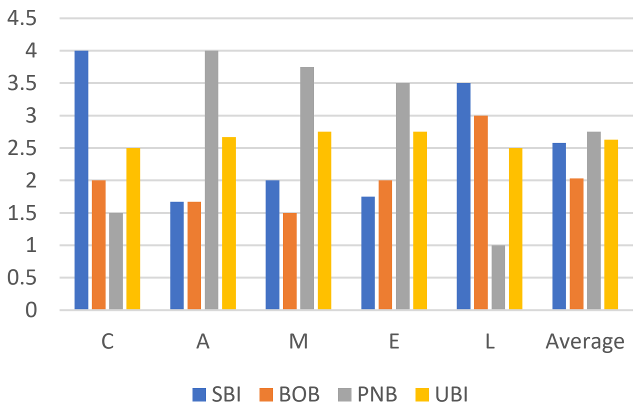
Based on the overall ranking of Liquidity, Punjab National Bank (PNB) ranks first with an average rank of 1, showcasing its strong position in managing liquid assets effectively. Union Bank of India (UBI) secures the second position with an average rank of 2.5, reflecting satisfactory liquidity management. Bank of Baroda (BOB) ranks third with an average of 3, indicating moderate performance in maintaining liquidity. State Bank of India (SBI) ranks last with an average rank of 3.5, highlighting a relative weakness in liquidity management and a need to enhance its short-term asset allocation strategies.

6.6 Consolidated CAMEL Ranking

Table -23 Overall CAMEL Ranking

CAMEL	SBI	BOB	PNB	UBI
Average Rank of C – Capital Adequacy	4	2	1.5	2.5
Average Rank of A – Asset Quality	1.67	1.67	4	2.67
Average Rank of M – Management Quality	2	1.5	3.75	2.75
Average Rank of E – Earnings Quality	1.75	2	3.5	2.75
Average Rank of L – Liquidity	3.5	3	1	2.5
Average	**2.58**	**2.03**	**2.75**	**2.63**
Overall Rank	**2**	**1**	**4**	**3**

Based on the consolidated CAMEL ranking, Bank of Baroda (BOB) emerges as the top-performing public sector bank with the lowest average rank of 2.03, securing the first overall rank. BOB demonstrates consistent strength across key parameters such as capital adequacy, management quality, and liquidity. This reflects the bank's effective risk management practices, operational efficiency, and sound financial strategies. State Bank of India (SBI) follows closely with an average rank of 2.58, earning the second position, supported by strong earnings quality and asset quality, although its liquidity management remains an area of improvement.



Rankings of Banks

Punjab National Bank (PNB) ranks last with the highest average rank of 2.75, indicating challenges across multiple CAMEL parameters, particularly asset quality and earnings. Union Bank of India (UBI) takes the third spot with an average rank of 2.63, reflecting moderate performance across most dimensions but a relatively strong position in capital adequacy. These rankings underscore the importance of a balanced performance across all CAMEL parameters for sustaining financial stability and achieving a competitive edge in the public banking sector.

7. Findings

- Bank of Baroda (BOB) ranked highest overall, excelling in asset quality and liquidity management, reflecting strong financial stability.
- State Bank of India (SBI) performed well in earnings and asset quality but needs improvement in liquidity management.
- Punjab National Bank (PNB) faced significant challenges, including high non-performing assets and weaker profitability, despite a strong liquidity position.
- Union Bank of India (UBI) demonstrated moderate performance, with strengths in capital adequacy and liquidity but room for improvement in management efficiency and earnings quality.
- Capital Adequacy remains a challenge, with BOB leading in this parameter, followed by PNB.
- Earnings Quality highlighted SBI’s strong profitability, while PNB and UBI lagged.
- Liquidity Management showcased PNB as the leader, supported by its strong liquid asset position.

8. Conclusion

This study evaluated four major PSBs using the CAMEL model. Bank of Baroda (BOB) ranked highest, excelling in asset quality and liquidity, while SBI showed strong earnings but needs better liquidity management. PNB struggled with non-performing assets, and UBI had moderate performance. Balanced improvement across all CAMEL parameters is essential for sustained financial stability and growth.

9. Future Scope

This study can be extended to include private and regional banks for a broader comparison using the CAMEL model. Future research can explore the impact of digital transformation, fintech innovations, and ESG factors on bank performance. Additionally, incorporating international comparisons could provide insights into global best practices for improving financial stability and operational efficiency.

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