



A CAMEL MODEL ANALYSIS OF PUBLIC BANKS IN INDIA

ABSTRACT

A reliable indicator and metric for determining whether an economy's economic operations are sound is performance review of the banking sector. The performance and financial soundness of a few Indian public banks have been assessed in the current study for the years 2018 through 2022. The financial health of the chosen banks has been examined using the CAMEL technique. To arrive at the result through the comparison and significant examination of several CAMEL factors, Composite Rankings, mean (μ), median (Med.) and standard deviation (σ) have been utilised. According to the CAMEL analysis, State Bank of India is placed first, followed by Union Bank of India, while Bank of Baroda took the third spot. Punjab National Bank is in the fourth spot, and the last spot was acquired by Bank of India.

Keywords: Public Sector Banks, CAMEL, Capital Adequacy

INTRODUCTION

The banking sector is a crucial part of the financial system and aids in the facilitation of monetary policy as well as stimulating capital formation, innovation, and monetization. It also plays a significant role in the economic development of nations. During the liberalisation process, the Indian banking industry has seen a number of changes. Since 1969, when the Indian government nationalised all major banks, public sector banks have dominated the Indian banking sector.

The ability of a bank to compete in the market and play a crucial part in the development of the sector are determined by its financial stability and performance evaluation, which has implications for shareholders, employees, stakeholders, and the entire economy of a nation. In response to this remark, efforts are made periodically to assess each bank's financial standing and manage it effectively. (Mohiuddin, 2014)

A regulatory framework for banking supervision must be put in place in order to assess the overall performance of banks. The CAMEL rating system, one of several measures of supervisory information, was first implemented in the United States in 1979 and has since been proven to be a helpful and effective instrument in the U.S. Government's reaction to the financial crisis in 2008. (Dang)

This study is structured as follows: after the introduction, the following section discusses the pertinent literature. The goals and methodology of the study are described in the third part. The fourth portion describes the findings and analyses, while the final section contains the key conclusions and recommendations.

LITERATURE REVIEW

For the years 1998 to 2007, **Mathuva (2009)** looked studied the correlations between profitability, capital adequacy ratio, and cost income ratio (CIR). According to the study, capital adequacy has a variety of effects on the bank's profitability.

Using the CAMEL technique, **Mishra et al. (2012) and Misra (2013)** examined the performance of 12 public and private sector banks from 2000 to 2011. It was determined that private sector banks were expanding more quickly than public sector banks. Low economic soundness was demonstrated by Union Bank and SBI. Using the CAMEL technique, it evaluated the State Bank Group's operations and financial stability. According to the study's findings, the company has to strengthen its position in terms of asset quality and capital sufficiency.

In Turkey between 2001 and 2009, **Erol (2013)** compared the performance of Islamic banks to that of regular banks. The findings demonstrated that Islamic banks outperformed conventional banks in terms of profitability and asset management ratios, but lagged behind in terms of sensitivity to market risk criteria.

Rostami (2015) examined how the CAMELS model's various parameters affected the efficiency of Iranian banks. In this study, the Q-ratio Tobin's served as a performance measure. It was discovered that there was a meaningful relationship between each CAMEL model category and the Q-ratio, Tobin's which serves as a measure of bank performance.

For the years 2009 to 2013, **Majumdar (2016)** evaluated the financial performance of 15 Bangladeshi banks. The CAMEL model was used to assess the financial stability of a few banks. The data had undergone an ANOVA test, average, and composite ranking. The investigation found that the performance of a few selected institutions had varied significantly. The research recommended that banks take the necessary action to fix these flaws.

Through the use of the CAMEL technique, **Ramya (2017)** analyses the financial performance of the State Bank of India during the research period of 2012–2016. It was determined that action must be taken to strengthen SBI's position in relation to a few factors, including the debt-to-equity ratio, operating profit, and the ratio of non-interest income to total income.

For the years 2006 to 2015, **Singh (2017)** looked at the capital adequacy performance of India's commercial and public sector banks. Except for the Central Bank of India, all the banks were determined to have strong capital adequacy positions.

OBJECTIVE AND RESEARCH METHODOLOGY

This paper's major goal is to evaluate the financial performance of a few public banks in India and to look into the main elements that influence those banks' financial performance. In order to learn more about the current state of the phenomenon and to characterise "what existing" in terms of variables, the current study is both descriptive and exploratory in nature. Out of the banks listed on the NSE, the top five public sector banks are State Bank of India, Punjab National Bank, Union Bank of India, Bank of India, and Bank of Baroda.

This study is solely based on secondary data that was gathered from the Reserve Bank of India, Capitoline data base, and annual reports of a few selected banks throughout a five-year period, from the years 2018 to 2022. The financial stability of the chosen banks has been examined using the CAMEL technique. Under each CAMEL acronym and the overall rankings, specific Ratios have been computed. Mean (μ), Median (Med.) and Standard Deviation (σ) are used in this case to draw a conclusion via a substantial comparison of the various CAMEL parameters.

RESULTS AND ANALYSIS

Based on the CAMEL framework, the financial soundness of the chosen banks will be examined in this section. The selection of indicators is based on their analytical value, the availability of data for compilation, calculation, and their relevance for the investigation. Only those indicators are chosen that are appropriate for the study. The study's chosen indicators are listed in the following table under each CAMEL acronym.

Capital Adequacy	Assets Quality	Managerial Efficiency	Earning Capability	Liquidity
Capital Adequacy Ratio	Net NPA/ Net Advances	Return on Capital Employed	Net Interest Margin	Cash Deposit Ratio
	Return on Assets	Return on Net Worth / Equity	Net Profit Margin	

CAPITAL ADEQUACY

The bank's capital adequacy status shows if it has enough capital to cover unforeseen losses. It is necessary to preserve depositor confidence and keep the bank from failing. (Reddy, 2012) "According to "The United States Uniform Financial Institutions Rating System 1997," "Meeting statutory minimum capital requirements is the key factor in deciding the capital adequacy and maintaining an adequate level of capital is a critical element." This demonstrates the firm's capacity for liability protection. It will be very risky for banks to be able to meet the demand of their depositors if there are any loan losses. Therefore, it is essential to maintain a high level of capital adequacy in order to avoid the bank from failing. (Chen , 2003) According to regulatory standards, Indian public sector banks are urged to maintain a CAR of 12 percent whereas Indian scheduled commercial banks are expected to maintain a CAR of 9 percent.

Table 2: Capital Adequacy of Selected Banks

Name of the Banks	2018	2019	2020	2021	2022
Bank of Baroda	12.00%	13.00%	13.00%	14.00%	15.00%
Punjab National Bank	9.00%	10.00%	14.00%	14.00%	14.00%
Union Bank of India	11.00%	12.00%	13.00%	12.00%	14.00%
Bank of India	13.00%	14.00%	13.00%	14.00%	17.00%
State Bank of India	13.00%	13.00%	13.00%	13.00%	13.00%

Table 3: Metrics for Capital Adequacy

Name of the Banks	Mean (μ)	Median (Med.)	Standard Deviation (σ)
Bank of Baroda	13.40%	13.00%	1.02%
Punjab National Bank	12.20%	14.00%	2.23%
Union Bank of India	12.40%	12.00%	1.02%
Bank of India	14.20%	14.00%	1.47%
State Bank of India	13.00%	13.00%	0.00%

Table 4: Overall Rank of Capital Adequacy based on Mean (μ) Values

Rank Allotted	I	II	III	IV	V
Name of the Bank	Bank of India	Bank of Baroda	State Bank of India	Union Bank of India	Punjab National Bank

In terms of total Capital Adequacy, Bank of India ranks first, followed by Bank of Baroda, State Bank of India, and Union Bank, according to Tables 2, 3, and 4. The bank is in a favourable position if its composite rank is the lowest. When compared to the other banks included in the survey, Punjab National Bank is in last place. Bank of India has the greatest capital adequacy at 14.20 percent, followed by Bank of Baroda at 13.40 percent. In comparison to other banks, Punjab National Bank has the largest Standard Deviation (σ), which indicates greater volatility.

ASSET QUALITY

An important factor to consider when determining the level of financial strength is the quality of the assets. Determining the composition of non-performing assets (NPAs) as a percentage of all assets is the main goal when evaluating the quality of the assets.

This study is limited to two metrics, namely Net NPA/Net Advances and Return on Assets, in order to identify the Asset Quality for the five selected banks.

The conclusion for Asset Quality will be drawn using the Mean (μ) for both of these indicators.

Table 5: Net NPA/Net Advances of Selected Banks

Name of the Banks	2018	2019	2020	2021	2022
Bank of Baroda	5.49%	3.33%	3.13%	3.09%	1.72%
Punjab National Bank	11.22%	6.55%	5.77%	5.72%	4.79%
Union Bank of India	8.42%	6.93%	5.49%	4.62%	3.68%
Bank of India	8.26%	5.62%	3.89%	3.35%	2.28%
State Bank of India	5.73%	30.15%	2.23%	1.50%	1.02%

Table 6: Return on Assets of Selected Banks

Name of the Banks	2018	2019	2020	2021	2022
Bank of Baroda	-0.25%	0.13%	0.07%	0.12%	0.58%
Punjab National Bank	-1.55%	-1.21%	0.05%	0.20%	0.28%
Union Bank of India	-1.06%	-0.58%	-0.56%	0.26%	0.44%
Bank of India	-0.96%	-0.86%	-0.46%	0.28%	0.46%
State Bank of India	0.12%	0.01%	0.47%	0.46%	0.65%

Table 7: Metrics for Asset Quality

Name of the Banks	Mean (μ)	Median (Med.)	Standard Deviation (σ)
Bank of Baroda	1.74%	1.62%	0.74%
Punjab National Bank	3.18%	2.91%	1.52%
Union Bank of India	2.76%	2.47%	1.12%
Bank of India	2.19%	1.71%	1.34%
State Bank of India	4.21%	1.35%	5.71%

Table 8: Overall Rank of Asset Quality based on Mean (μ) Values

Rank Allotted	I	II	III	IV	V
Name of the Bank	State Bank of India	Punjab National Bank	Union Bank of India	Bank of India	Bank of Baroda

Together, Tables No. 5, No. 6, No. 7, and No. 8 show that State Bank of India's asset quality is significantly higher than that of other banks. In terms of assets quality, Punjab National Bank came in second place, followed by Union Bank of India, Bank of India, and Bank of Baroda, in that order. Additionally, State Bank of India displayed the greatest Standard Deviation (σ) of 5.71 percent, making it the most variable bank in terms of Asset Quality.

MANGEMENT EFFICIENCY

Another crucial element of the CAMEL model that assures a bank's survival and expansion is management effectiveness. The other components of the CAMEL model can be easily evaluated using the most recent financial records, but management quality is a more elusive and subjective metric that is nonetheless essential for institutional success. The banking sector changes underline the necessity of enhancing bank productivity through suitable actions that decrease operating expenses and increase profitability.

This study is limited to two factors to identify the Asset Quality for the five selected institutions. i.e., Return on Capital Employed (ROCE) and Return on Net Worth/Equity.

The Mean (μ) on both these metrics will be considered in order to reach to the conclusion for the Management Efficiency.

Table 9: Return on Capital Employed (ROCE) of Selected Banks

Name of the Banks	2018	2019	2020	2021	2022
Bank of Baroda	1.88%	1.96%	1.78%	1.97%	1.88%
Punjab National Bank	1.37%	1.69%	1.81%	1.88%	1.60%
Union Bank of India	1.57%	1.55%	1.71%	1.85%	1.89%
Bank of India	1.19%	1.33%	1.80%	1.53%	1.40%
State Bank of India	1.91%	0.00%	1.94%	1.77%	1.57%

Table 10: Return on Net Worth/Equity of Selected Banks

Name of the Banks	2018	2019	2020	2021	2022
Bank of Baroda	-4.05%	2.20%	1.21%	1.87%	8.54%
Punjab National Bank	-31.26%	-22.51%	0.74%	3.00%	4.26%
Union Bank of India	-22.75%	-11.92%	-10.16%	4.79%	7.97%
Bank of India	-16.21%	-14.79%	-7.88%	5.12%	7.04%
State Bank of India	-2.21%	0.98%	8.69%	8.89%	12.53%

Table 11: Metrics for Managerial Efficiency

Name of the Banks	Mean (μ)	Median (Med.)	Standard Deviation (σ)
Bank of Baroda	1.92%	1.88%	2.03%
Punjab National Bank	-3.74%	1.22%	7.48%
Union Bank of India	-2.35%	-4.23%	5.74%
Bank of India	-1.18%	-2.46%	5.06%
State Bank of India	3.97%	4.62%	2.64%

Rank Allotted	I	II	III	IV	V
Name of the Bank	State Bank of India	Bank of Baroda	Bank of India	Union Bank of India	Punjab National Bank

This managerial effectiveness is illustrated by Tables Nos. 9, 10, 11, and 12. In terms of results compared to other banks, State Bank of India performed better, followed by Bank of Baroda, Bank of India, and Union Bank of India, with Punjab National Bank receiving the lowest ranking. When it comes to volatility, the Punjab National Bank has the largest Standard Deviation (σ) of 7.48 percent, which makes it more susceptible in terms of Management Efficiency when compared to other chosen banks.

EARNING CAPABILITIES

A key factor in determining a bank's capacity to generate continuous profits is the quality of its earnings. In essence, it establishes a bank's profitability and shows how it can sustain and increase its earnings in the long run. For tasks like paying dividends, maintaining proper capital levels, offering investment options for bank expansion, developing strategies for starting new businesses, and keeping a competitive edge, banks rely on their robust earning capacity. This study is limited to two metrics, namely, Net Interest Margin and Net Profit Margin, in order to identify the Earning Capabilities for the five selected banks. The Mean (μ) on both these metrics will be considered in order to reach to the conclusion for the Earning Capabilities.

Name of the Banks	2018	2019	2020	2021	2022
Bank of Baroda	2.57%	2.48%	2.40%	2.58%	2.57%
Punjab National Bank	1.95%	2.21%	2.10%	2.42%	2.19%
Union Bank of India	1.93%	2.08%	2.09%	2.32%	2.34%
Bank of India	1.72%	2.18%	2.32%	1.96%	1.91%
State Bank of India	2.27%	2.50%	2.59%	2.51%	2.49%

Name of the Banks	2018	2019	2020	2021	2022
Bank of Baroda	-4.15%	2.05%	1.19%	1.95%	10.49%
Punjab National Bank	-25.82%	-19.22%	0.66%	2.62%	4.82%
Union Bank of India	-15.84%	-8.54%	-8.11%	4.08%	7.63%
Bank of India	-15.85%	-13.40%	-6.87%	5.38%	8.89%
State Bank of India	-1.82%	1.21%	6.73%	8.73%	12.53%

Table 15: Metrics for Earning Capabilities

Name of the Banks	Mean (μ)	Median (Med.)	Standard Deviation (σ)
Bank of Baroda	2.41%	2.26%	2.38%
Punjab National Bank	-2.61%	1.43%	6.38%
Union Bank of India	-1.00%	-3.01%	4.43%
Bank of India	-1.18%	-2.46%	5.06%
State Bank of India	3.97%	4.62%	2.64%

Table 16: Overall Rank of Earnings Capabilities based on Mean (μ) Values

Rank Allotted	I	II	III	IV	V
Name of the Bank	State Bank of India	Bank of Baroda	Union Bank of India	Bank of India	Punjab National Bank

Together, Tables Nos. 13, 14, 15, and 16 show that State Bank of India has superior managerial efficiency than other banks, with Bank of Baroda, Bank of India, and Union Bank of India following closely behind, with Punjab National Bank receiving the lowest ranking. Compared to other chosen banks, Punjab National Bank has the largest Standard Deviation (σ) of 6.38 percent, which makes it more vulnerable in terms of earning capabilities.

LIQUIDITY

Financial soundness is significantly impacted by liquidity, which also assesses a bank's operating efficiency. It reveals a bank's ability to cover short-term obligations and deal with unforeseen depositor withdrawals. A company's liquidity demonstrates its capacity to transform its assets into cash without suffering any losses. The banks' liquidity ensures that depositors can access their money whenever necessary and demonstrates the stability and durability of the industry. While having too much money hurts profitability, having too little liquidity increases the chance of going bankrupt.

This study is limited to one parameter, the cash deposit ratio, in order to identify the liquidity for the five selected banks. The conclusion for the liquidity will be reached after taking into account the Mean (μ) on the chosen metric.

Table 17: Cash Deposit Ratio of Selected Banks

Name of the Banks	2018	2019	2020	2021	2022
Bank of Baroda	-9.59%	0.95%	0.04%	-0.08%	-2.88%
Punjab National Bank	0.07%	-2.99%	-0.02%	-0.22%	1.04%
Union Bank of India	3.50%	0.07%	2.68%	-1.49%	0.89%
Bank of India	-0.24%	3.22%	3.16%	6.39%	2.54%

State Bank of India	0.15%	1.82%	3.39%	-5.57%	1.26%
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Table 18: Metrics for Liquidity

Name of the Banks	Mean (μ)	Median (Med.)	Standard Deviation (σ)
Bank of Baroda	-1.22%	0.07%	4.40%
Punjab National Bank	0.61%	0.95%	2.08%
Union Bank of India	1.85%	2.68%	1.52%
Bank of India	-0.19%	-0.22%	3.85%
State Bank of India	0.57%	1.04%	1.82%

Table 19: Overall Rank of Liquidity based on Mean (μ) Values

Rank Allotted	I	II	III	IV	V
Name of the Bank	Union Bank of India	Punjab National Bank	State Bank of India	Bank of India	Bank of Baroda

The three preceding tables, numbered 17, 18, and 19, collectively show that Union Bank of India has a far superior liquidity situation than Punjab National Bank, State Bank of India, and Bank of India, in that order. In terms of liquidity, Bank of Baroda achieved the lowest ranking. Due to its highest Standard Deviation (σ) of 4.40 percent among the selected banks, Bank of Baroda is considered to have the highest level of volatility.

OVERALL RANKING

The following Tables No. 1 through Table No. 19 give the banks' overall rankings after taking into account all of the CAMEL analysis's sub-criteria rankings for the five-year period (2018–2022). The ultimate grand rating is determined by taking the group rankings of all the banks that were taken into consideration for the study and averaging them out. According to the CAMEL analysis, Union Bank of India comes in second place, with State Bank of India taking the first spot. Bank of Baroda is ranked third. Punjab National Bank holds down the fourth spot. For the period of 2018 to 2022, Bank of India, out of all the selected institutions, holds the final position according to the CAMEL study.

Table 20: Overall Ranking of the Selected Banks based on CAMEL Parameters

Weights Given	[1]	[2]	[3]	[4]	[5]	[15]	Final Rank
Banks	Capital Adequacy	Asset Quality	Managerial Efficiency	Earning Capabilities	Liquidity Metrics	Weighted Average Ranks	
State Bank of India	3	1	1	1	3	1.8	I
Union Bank of India	4	3	4	3	1	2.6	II
Bank of Baroda	2	5	2	2	5	3.4	III
Punjab National Bank	5	2	5	5	2	3.6	IV
Bank of India	1	4	3	4	4	3.6	V

CONCLUSION AND SUGGESTION

The State Bank of India is ranked first among the other banks included in the study when all of CAMEL's criteria are taken into account, according to the model. While State Bank of India lags behind in terms of capital adequacy and liquidity, it performs well in terms of asset quality, management effectiveness, and earning capacity. In contrast, due to its poor performance in terms of capital adequacy, earning capacity, and liquidity, while doing better in terms of capital adequacy, Bank of India is at the lowest place when compared to other banks under the research. Therefore, Bank of India should strengthen those sectors where it is particularly weak. Consequently, the related policy makers

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