



ROLE OF BANKS PERFORMANCE IN INDIA USING CAMEL MODEL -WITH SPECIAL REFERENCE TO BANK OF INDIA- AN EMPIRICAL EVIDENCE

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ABSTRACT-----

The performance of banks plays a crucial role in the stability and growth of the financial system and the overall economy. This study investigates the performance of **Bank of India** using the **CAMEL model**, which evaluates banks based on **Capital adequacy, Asset quality, Management efficiency, Earnings, and Liquidity**. The research employs empirical data from the bank's annual reports and financial statements over a specified period to assess its financial health and operational efficiency. The findings reveal the strengths and weaknesses of the bank across different CAMEL parameters, highlighting areas where the bank performs well and areas requiring improvement. The study provides insights into how effective management and sound financial practices influence the bank's overall performance. The results also serve as a reference for policymakers, regulators, and banking professionals aiming to enhance the efficiency and sustainability of public sector banks in India. The purpose of this study is to evaluate the **performance of Bank of India** using the **CAMEL model**, which measures banks' strength in terms of **Capital adequacy, Asset quality, Management efficiency, Earnings, and Liquidity**. The study aims to provide a comprehensive understanding of the financial health and operational efficiency of the bank, identifying areas of strength and potential improvement. By analyzing empirical data, the study seeks to offer insights into how effective management practices, sound financial strategies, and prudent resource allocation contribute to the overall performance of a public sector bank. The findings are intended to guide policymakers, regulators, and banking professionals in enhancing the stability and efficiency of banks in India.

KEY WORDS

- Bank Performance
- CAMEL Model
- Bank of India
- Capital Adequacy
- Asset Quality
- Management Efficiency
- Earnings

JEL CODES

- G21 – Banks; Depository Institutions; Micro Finance; Mortgages
- G28 – Government Policy and Regulation
- G32 – Financing Policy; Financial Risk and Risk Management;
- C12 – Hypothesis Testing: General
- C38 – Classification Methods; Cluster Analysis; Principal Components; Factor Models-----

INTRODUCTION

Indian banks' performance is crucial for economic growth, acting as financial intermediaries that mobilize savings and channel credit to industries, infrastructure, and individuals, driving development, financial inclusion (like Jan Dhan Yojana), and stability through lending and managing capital, while facing challenges like NPAs but improving profitability with reforms like the IBC and digital innovation, impacting GDP, employment, and overall financial health.

Key Roles & Contributions

- Economic Growth Engine: Banks fund industrial projects, infrastructure (power, transport), and new ventures, fueling job creation and economic expansion.



- Financial Intermediation: They bridge savers and borrowers, collecting public funds and making them available as loans, vital for investment.
- Financial Inclusion: Expanding access to banking services for unbanked and underbanked populations, especially in rural areas, uplifting living standards.
- Monetary Policy Transmission: Influence the economy by controlling money supply and credit flow through interest rates (Repo/Reverse Repo) set by the RBI.
- Capital Market Support: Facilitate capital formation and market growth by providing resources and supporting capital markets.

Performance Indicators & Trends:

- Profitability & Stability: Showing strengthening profitability with declining Gross Non-Performing Assets (GNPA) due to reforms like the Insolvency and Bankruptcy Code (IBC).
- Digital Transformation: Embracing FinTech for better services, though facing competition and challenges in traditional areas.
- Public Sector Banks (PSBs): Key drivers of development, balancing commercial goals with social objectives, undergoing consolidation and modernization.
- Impact of Macro Variables: Performance is significantly linked to GDP, inflation (CPI), exchange rates, and lending rates.

Challenges & Focus Areas:

- NPAs & Governance: Managing bad loans and improving governance, especially in PSBs, remains a focus.
- Competition: Adapting to competition from FinTechs and evolving customer demands.
- Systemic Risks: Addressing market concentration and ensuring overall financial stability.

REVIEW OF LITERATURE

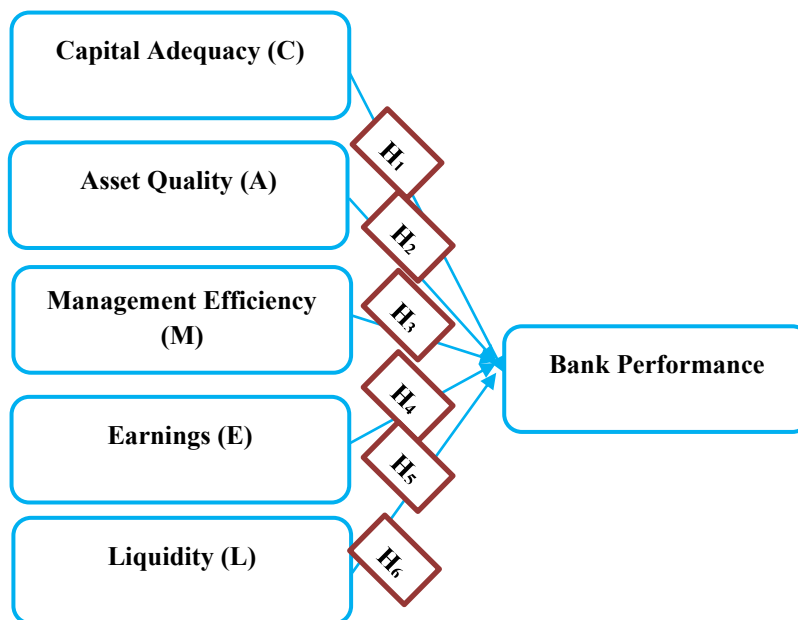
- **Naresh Kedia (2016):** This Paper has brought out that the explanatory power of some variables is significantly high. He has a find that net profits of public sector banks have significant correlation with net profit and credit deposit ratio has the largest effect on net profits and operating expenses have the least impact on the profits.
- **Dr R Thamil Selvan (2014):** This Paper has use the ratios of spread to total assets, net profit to average assets, interest income to total income and noninterest income to total income to assess the earning capacity of the banks. The author has opined that all the commercial banks maintained the RBI requirements norms of 10% and the debt equity ratio is high. Spread to total assets indicates better earning capacity of the bank.
- **V Mouneswari (2016):** This Paper has analysed 20 banks both nationalized and private sector banks together taking return on assets as dependent variable and profit per employee, debt-to-equity ratio, total assets to total deposits racial, net NPAs to total advances ratio as independent factors impacting the for financial performance of banks. Regression analysis has been applied to find out the most dominant factors that affects the financial performance of the banks.
- **Hari Krishna Karri (2015):** This Paper has opined that as soon as the bottom line of domestic banks come under increasing pressure and the options for organic growth exhaust themselves, Indian banks will need to explore ways for inorganic expansion. This, in turn is likely to unleash the forces of consolidation in Indian banking and stated that transparency and good governance would work as a principal guiding force in present scenario.
- **Dr Anoop Kumar Singh (2016):** This Paper has analysed stand-alone and amalgamated RRBs to measure the financial soundness of these banks using CAMEL model which is an appropriate technique. He has opined that amalgamation of Regional Rural Banks was considered to be a strong mechanism to strengthen all the branches financially but only amalgamation of banks is not enough and standalone bank has better performed, hence amalgamation is not the only way of improving the status of Regional Rural Banks.
- **Lucky Anyike Lucky (2017):** This Paper has examined CAMELS analysis of Nigerian quoted commercial banks from 1997 to 2016 prep and post consolidation. Time series data of the variables were sourced from financial statements of the quoted deposit money banks which in the period. For calculating the sensitivity parameter, the net interest income to gross domestic product has been considered. He has opined that the performance of commercial banks. In the post consolidation is better than the pre consolidation and that there is significant difference between pre and post consolidation of quoted commercial banks using CAMELS criteria. He has recommended that the banking sector reforms should be strengthened, deepened and the capital and management of the commercial bank should be used effectively to achieve the objective of banking sector reforms.
- **Loriya Chirag Thakarshibhai (2014):** This Paper has analysed the profitability of banks in India using mean, standard deviation and ANOVA test. He has opined that the private banks in India have got a Great response in terms of service and quality banking. Globalization has encouraged the multinationals and

foreign banks to set up their business units in developing country like India the private banking is all about delivering sophisticated service to customers.

- **Jeevan Jayant Nagarkar (2015)** has analysed the performance of banks in India by using standard two sample test. He has opined that banks are better if they depend on deposit money rather than borrowed money for dispersing advances. The objective of government to create bigger national level banks by merging smaller banks is justified by his study.
- **Dr. Mahila Vasanthi Thangam (2016):** This Paper has aopinedd that the banks must concentrate on per branch productivity as well as per employee productivity because number of employees are of highly influencing the productivity of banks. The rightsizing of banks is the only solution to improve productivity in Indian banking industry to fulfill the goal of Indian financial sector reforms and to improve the Indian banking sector to the international standard.
- **Vincent Okoth Ongore (2013):** This Paper has analysed the determinants of financial performance of commercial banks in Kenya using multiple regression model and generalized least square on panel data estimate the parameters. He has opined that the overall effect of macroeconomic variables was inconclusive at 5% significance level and the moderating role of ownership identity on the overall performance of commercial banks in Kenya was not significant.

RESEARCH METHODOLOGY

- **Conceptual Model**



- **Statement of the Problem**

The banking sector is a critical component of India's financial system, contributing significantly to economic growth, financial inclusion, and capital mobilization. Despite its importance, public sector banks like **Bank of India** face multiple challenges, including high levels of non-performing assets, managerial inefficiencies, liquidity pressures, and regulatory constraints. Evaluating the performance of such banks is essential to ensure financial stability, operational efficiency, and sustained profitability.

Although several studies have analyzed bank performance using financial ratios, there is limited research that applies a **comprehensive and systematic approach such as the CAMEL model** to assess the overall health of Bank of India. A detailed evaluation using CAMEL can provide empirical evidence on the bank's strengths and weaknesses in terms of **capital adequacy, asset quality, management efficiency, earnings, and liquidity**. Addressing this gap is crucial for policymakers, regulators, bank management, and stakeholders to make informed decisions that enhance performance, ensure risk management, and contribute to the broader development of India's banking sector.

- **Research Gap**

Although several studies have examined the performance of Indian banks, much of the existing literature focuses on general financial ratios or compares public and private sector banks at an aggregate level. Very



few studies provide a **comprehensive evaluation of a specific public sector bank, such as Bank of India, using the CAMEL model**. Moreover, most previous research is either outdated or does not incorporate recent financial reforms, regulatory changes, and operational developments in the banking sector.

Additionally, while the CAMEL model is widely recognized for assessing bank performance, its application to individual Indian public sector banks remains limited, particularly in terms of providing **empirical evidence on strengths and weaknesses across all five CAMEL parameters**. This gap highlights the need for a focused, detailed, and updated analysis of Bank of India to inform policymakers, regulators, and bank management about areas requiring improvement and strategies to enhance overall performance and stability.

Objectives of the Study

- To evaluate the overall performance of Bank of India using the CAMEL model framework.
- To analyze the capital adequacy of Bank of India and assess its ability to absorb potential losses.
- To examine the asset quality of the bank, including the level of non-performing assets and loan portfolio management.
- To assess management efficiency in terms of operational effectiveness, cost management, and decision-making.

1.

Hypothesis of the Study

- H₀₁ (Null Hypothesis): Capital adequacy has no significant impact on the overall performance of Bank of India.
- H₁₁ (Alternative Hypothesis): Capital adequacy has a significant positive impact on the overall performance of Bank of India.
- H₀₂: Asset quality does not significantly influence the overall performance of Bank of India.
- H₁₂: Asset quality significantly influences the overall performance of Bank of India.
- H₀₃: Management efficiency has no significant effect on the performance of Bank of India.
- H₁₃: Management efficiency has a significant positive effect on the performance of Bank of India.

RESULT & DISCUSSION

Capital Adequacy (C): It refers to statutory minimum reserves of capital a bank or other financial institutions must have available with them. This is assessed through capital trend analysis. For higher rating, financial institutions must comply with interest and dividend rules and practices.

Asset Quality (A): It is a review or evaluation that assesses the credit risk associated with a particular asset. This is checked by the fair market value of investments compared with the bank’s book value of investments. This is reflected by the efficiency of bank’s investment policies and practices.

Management Efficiency (M): It refers to the ability of the financial institution to properly react to its financial stress. This component is reflected by the management’s capability to point out, measure and to look after and control the risks of institution’s daily activities.

Earnings Ability (E): It refers to the institution’s ability to create appropriate returns to be able to expand and retain competitiveness and adding capital.

Liquidity (L): It measures the ability of the institution to convert assets to cash easily depending on short term financial resources.

Table 1. Description of CAMEL parameters

Category	Ratios	Formula	Significance	Evaluation Criteria
Capital Adequacy	CAR	Tier-1 and Tier-2 Capital/Aggregate of Risk Weighted Assets (RWA)	It measures the bank's ability in absorbing the losses arising from the risk assets	Higher the ratio Better is the financial condition of the bank
	Debt/Equity Ratio	(Deposits + Borrowings +Other liabilities)/ (Capital + Reserves)	It indicates the bank's financial leverage	Lower the ratio Better it is
	Coverage Ratio	(Net Worth-Net NPAs)/ Total Assets	It indicates the availability of capital to meet any incidence of loss assets in NPAs	Higher the ratio Better it is
Asset Quality	Net NPA/Net Advances Ratio	NPAs/Net Advances	It indicates the level of NPAs in the net advances	Lower the ratio Better it is

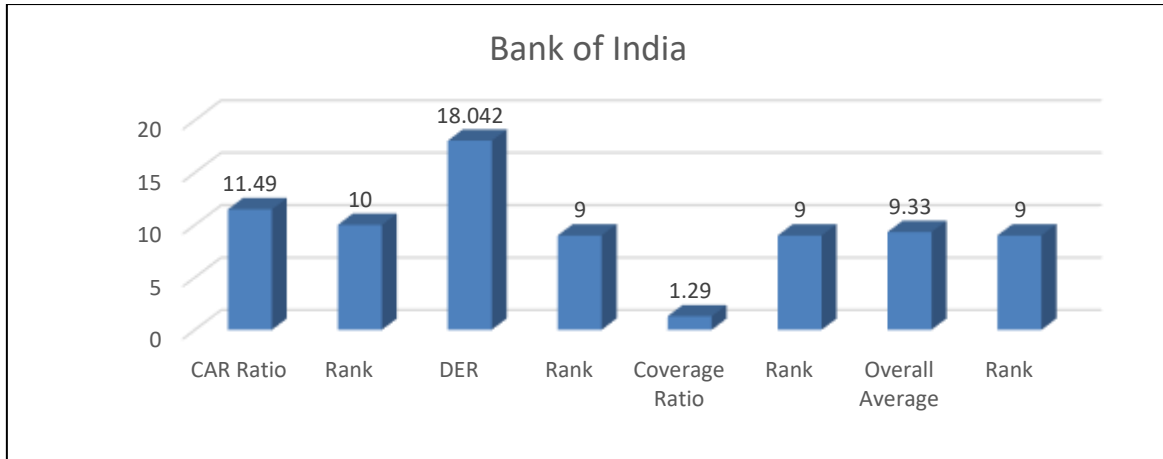


	Govt Securities/Investment Ratio	Government Securities/ Total Investments	It indicates the bank's strategy: High profits=High risk or Low profits=Low risk	Higher the ratio Safer it is
	Standard Advances/Total Advances Ratio	Standard Advances (Net of Total Assets and Gross NPAs)/ Total Advances	It indicates higher earnings if the bank assets are highly performing	Higher the ratio Better it is
Management Quality	Total Advances/Total Deposits Ratio	Total Advances/Total Deposits	It indicates the bank's ability to convert its deposits into higher earning advances	Higher the ratio Better it is
	Business per Employee	Total Advances and Total Deposits/No of Employees	It measures whether the bank is relatively over or under staffed	Higher the ratio Better it is
	Profit per Employee	Profit/No of Employees	It measures the efficiency of the bank's employees in maximizing the profits	Higher the ratio Better it is
Earnings Ability	Return on Assets	Net Profit after tax/Total Assets	It indicates the returns earned from the assets of the bank	Higher the ratio Better it is
	Income Spread/Total Assets Ratio	Interest Income Earned- Interest expended)/ Total Assets	It indicates how much a bank can earn for every rupee of investments made in assets	Higher the ratio Better it is
	Operating Profit/Total Assets Ratio	Operating Profit/Total Assets	It indicates the bank's ability to earn after meeting its operating expenses for the investments made in assets	Higher the ratio Better it is
	Cost/Income Ratio	Operating Expenses/Net Income	It indicates the bank's ability to meet its operating expenses from revenue generated	Lower the ratio Better it is
Liquidity	Cash Asset/Total Assets Ratio	Cash Asset/Total Assets	It measures cash in proportion to total assets	Higher the ratio Better it is
	Govt Securities/Total Assets Ratio	Govt Securities/Total Assets	It measures govt securities in proportion to total assets	Higher the ratio Better it is
	Liquid Assets/ Total Deposits Ratio	Liquid Assets/ Total Deposits	It indicates the bank's ability to meet its deposit obligations with available liquid funds	Higher the ratio Better it is

Table 2. Ranking under Capital Adequacy Parameter of AXIS Bank

$$\text{Capital Adequate Ratio (CAR) Formula} = \frac{(\text{Tier 1 Capital} + \text{Tier 2 Capital})}{\text{Risk Weighted Assets}}$$

Banks	CAR Ratio	Rank	DER	Rank	Coverage Ratio	Rank	Overall Average	Rank
Bank of India	11.49	10	18.042	9	1.29	9	9.33	9



The capital adequacy ratio (CAR) is a measure of how much capital a bank has available, reported as a percentage of a bank's risk-weighted credit exposures. The purpose is to establish that banks have enough capital on reserve to handle a certain amount of losses, before being at risk for becoming insolvent. From the above table and graph, it is interpreted that Bank of India shows the Capital Performance is 15.96.

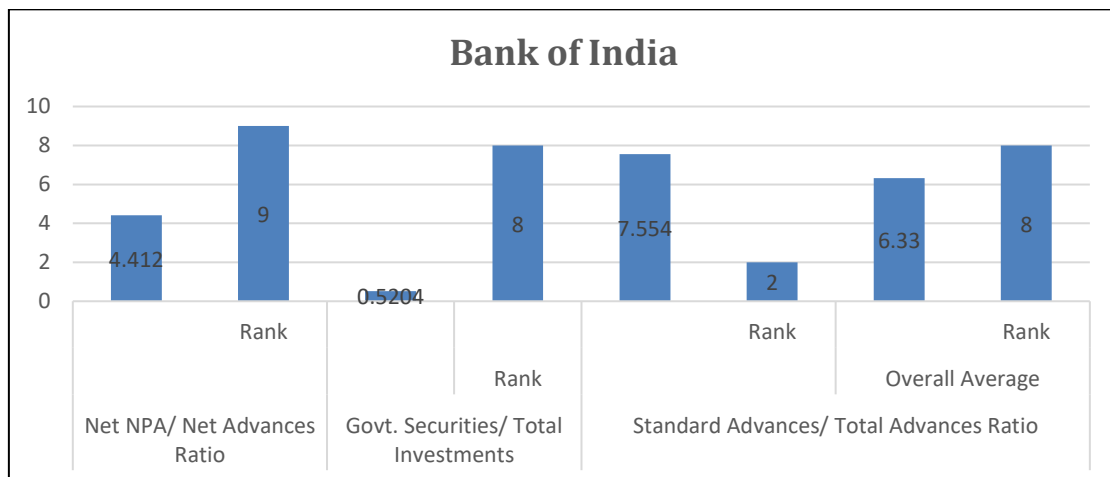
Table 3. Ranking under Asset Quality Parameter of AXIS Banak

NNPA Formula

$$\text{NNPA Ratio} = \frac{\text{Total NNPA}}{\text{Total Advances}}$$

NNPA = NPA minus the provision made by the bank.

Name of the Bank	Net NPA/ Net Advances Ratio	Rank	Govt. Securities/ Total Investments	Rank	Standard Advances/ Total Advances Ratio	Rank	Overall Average	Rank
Bank of India	4.412	9	0.5204	8	7.554	2	6.33	8



An asset quality rating refers to the assessment of credit risk associated with a particular asset, such as a bond or stock portfolio. The level of efficiency in which an investment manager controls and monitors credit risk heavily influences the rating bestowed. From the above table and graph, it is interpreted that Bank of India shows the Capital Performance is 0.794.



Table 4. Composite Ranking (CAMEL)

Bank Name	Rank (C)	Rank (A)	Rank (M)	Rank (E)	Rank (L)	Overall Average	Rank
Bank of India	9	8	5	10	3	7.00	9

CAMEL is an acronym for five parameters (capital adequacy, assets quality, management soundness, earnings and liquidity). CAMEL rating is a subjective model which assesses financial strength of a bank, whereas CAMEL ranking indicates the banks comparative position with reference to other banks. From the above table, the composite rankings of the banks i.e., based on the five parameters interpret housing development finance corporation (AXIS) shows the Capital Performance is 15.96 and the rank is 4. Overall Performance of the ICICI Bank is good.

Table 5. Ranking under Management Efficiency Parameter

Banks	Total Advances/ Total Deposit Ratio	Rank	Business per Employee	Rank	Profit per Employee	Rank	Overall Average	Rank
Bank of India	0.734	8	202,534,769.32	1	435,177.85	7	5.33	5

Management is an integral part of any organization. How well an organization is managed under specific circumstances can make or break it. Hence, effective and efficient management is the sole reason for any organization's success. It is imperative for an organization to strive for effective management. From the above table, it is interpreted that among all the banks and among private sector banks followed by Bank of India is 0.8634 was comparatively better than other were the least at management efficiency.

Table 6. Ranking under Earnings Ability Parameter

Banks	Return on Asset	Rank	Income Spread/ Total Assets Ratio	Rank	Operating Profit/ Total Assets Ratio	Rank	Cost/ Income Ratio	Rank	Over-all Average	Rank
Bank of India	0.068	10	5.62	10	(0.762)	9	35.514	5	8.50	10

Profitability ratios are a class of financial metrics that are used to assess a business's ability to generate earnings relative to its revenue, operating costs, balance sheet assets, or shareholders' equity over time, using data from a specific point in time. From the above table, it is interpreted that among all the banks was performing well having highest earnings ability ratio, followed by were comparatively better than other the least at earnings ability.

Table 7. Ranking under Liquidity Parameter

Banks	Cash Asset/ Total Asset Ratio	Rank	Government Securities/ Total Asset Ratio	Rank	Liquid Asset/ Total Deposit Ratio	Rank	Overall Average	Rank
Bank of India	0.1334	2	0.1054	9	0.1576	2	4.33	3

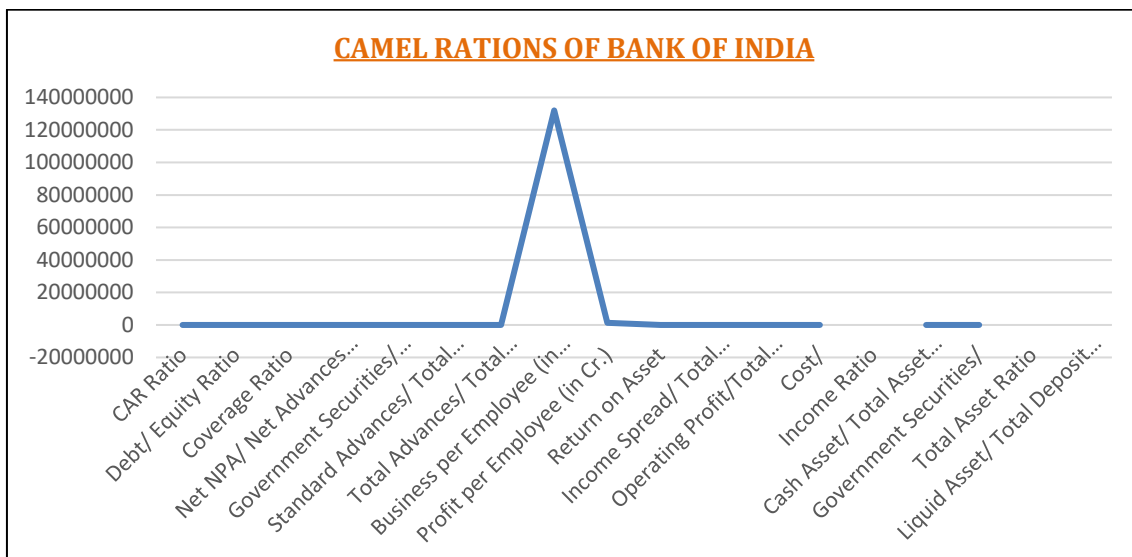
The liquidity parameter determines how much probabilities move after a forecast, with higher liquidity parameters leading to smaller changes and lower liquidity parameters leading to larger changes. From the above table, it is interpreted that among all the banks stood first in maintaining absolute liquidity every bank required to maintain to better respond immediately to the critical conditions at the time of huge withdrawals by the customers.



Table:8.CAMEL RATIONS.

Year	2019-20	2020-21	2021-22	2023-24	2024-25	Average
CAR Ratio	11.02	10.21	11.22	12.38	12.62	11.49
Debt/ Equity Ratio	17.44	17.56	18.19	18.19	18.83	18.042
Coverage Ratio	1.33	1.32	1.24	1.21	1.35	1.29
Net NPA/ Net Advances Ratio	2.05	1.99	3.35	7.78	6.89	4.412
Government Securities/ Total Investments Ratio	0.84	0.009	0.009	0.872	0.872	0.5204
Standard Advances/ Total Advances Ratio	2.98	3.14	5.36	13.09	13.20	7.554
Total Advances/ Total Deposit Ratio	0.758	0.777	0.756	0.700	0.679	0.734
Business per Employee (in Cr.)	159,257,600.51	457,404,408.35	206,166,041.94	0.00	189,845,795.79	202,534,769.32
Profit per Employee (in Cr.)	652,338.68	1,472,654.18	377,245.03	0.00	(326,348.65)	435,177.85
Return on Asset	0.67	0.58	0.33	(1.00)	(0.24)	0.068
Income Spread/ Total Assets Ratio	5.54	5.07	5.20	6.30	5.99	5.62
Operating Profit/Total Assets Ratio	(0.22)	(0.27)	(0.4)	(1.59)	(1.33)	(0.762)
Cost/ Income Ratio	28.14	29.36	29.09	47.23	43.75	35.514
Cash Asset/ Total Asset Ratio	0.121	0.107	0.123	0.163	0.153	0.1334
Government Securities/ Total Asset Ratio	0.176	0.002	0.002	0.169	0.178	0.1054
Liquid Asset/ Total Deposit Ratio	0.144	0.129	0.144	0.193	0.178	0.1576

The liquidity parameter determines how much probabilities move after a forecast, with higher liquidity parameters leading to smaller changes and lower liquidity parameters leading to larger changes. From the above table, it is interpreted that among all the banks stood first in maintaining absolute liquidity every bank required to maintain to better respond immediately to the critical conditions at the time of huge withdrawals by the customers.



CONCLUSION

The study of Bank of India’s performance using the CAMEL model provides a comprehensive understanding of its financial health and operational efficiency. The analysis reveals that the bank demonstrates strengths in certain areas, such as capital adequacy and liquidity management, indicating its ability to absorb potential losses and meet short-term obligations effectively. However, areas like asset quality and management efficiency require attention,



as high levels of non-performing assets and operational inefficiencies can affect profitability and long-term sustainability. Earnings performance highlights the need for improved profitability strategies, while management practices must focus on cost efficiency and effective decision-making. Overall, the CAMEL-based evaluation emphasizes that while Bank of India maintains a stable position in the public sector banking landscape, there is room for improvement in critical areas to enhance performance, competitiveness, and customer confidence.

FURTHER SCOPE

- **Comparative Analysis with Other Banks:** Future research can expand the study by comparing the performance of Bank of India with other public sector and private sector banks to identify sector-wide trends and best practices.
- **Longitudinal Study:** The scope can be extended to a long-term study covering more years to analyze performance trends over time, particularly in response to economic cycles, regulatory changes, and banking reforms.
- **Inclusion of Additional Variables:** Future studies can include other factors influencing bank performance, such as technological adoption, customer satisfaction, corporate governance, and risk management practices, alongside the CAMEL parameters.
- **Regional and Branch-Level Analysis:** Researchers can explore performance differences across various regions or branches to provide more granular insights for management and policymakers.
- **Impact of Digital Banking:** With the growing adoption of digital banking services, future studies could analyze how technological innovations affect bank performance and operational efficiency.

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