

# Comparative Performance Analysis of Selected Commercial Banks in India: Camel Model

Suman<sup>1</sup> and Swati<sup>2</sup>

{sumanmann1115@gmail.com<sup>1</sup>, swatimann@gmail.com<sup>2</sup>}

Department of Management Studies, Deenbandhu Chhotu Ram University of Science & Technology, Murthal, Haryana, India<sup>1</sup>, Department of Management, School of Management & Business Studies, Jamia Hamdard (Deemed to be University), New Delhi, India<sup>2</sup>

**Abstract.** One of the key instruments suggested to assess the performance and financial stability of banks is CAMEL, which has five parameters: capital sufficiency, asset quality, management quality, earning quality, and liquidity. As banks are crucial to a nation's economic development and prosperity, it is crucial to evaluate their performance. As a result, the current study's goal is to use the CAMEL model to examine the performance of a few chosen commercial banks that operate in India from 2013–2014 to 2017–2018. This study uses a sample of 12 commercial banks, of which 7 were from the public sector and 5 from the private sector. According to analysis results, HDFC Bank is in first place, followed by Axis Bank and Kotak Bank, in that order. Among all the chosen banks, Bank of India holds the final spot. A statistically significant difference between the CAMEL ratios of the chosen public and private sector banks in India can also be inferred.

**Keywords:** CAMEL analysis, financial performance, Commercial Banks.

## 1 Introduction

Banks are among the financial institutions that are crucial to the expansion and improvement of an entire nation's economy. Since 1991, the banking industry has been experiencing an extensive and complex phase of reorganisation to improve its soundness and operational efficiency. At the same time, it is solidifying its ties with the real sector in order to encourage savings, investment, and economic growth.

A poor banking sector not only jeopardises an economy's long-term viability, but it can also serve as a catalyst for a financial crisis that can result in an economic crisis [22]. Therefore, it is crucial for any economy to periodically be aware of the financial results of the banking sector. There are many models for analysing the financial performance of banks, and one of them is the CAMEL model, which has five parameters: enough capital, high-quality assets, effective management, profitable earnings, and liquidity.

The remaining portions of our essay are as follows: Review of the literature takes up section two. The study's research aims are described in section three. The research technique is

explained in section four. The analysis and interpretation of the results are shown in section five. The study is concluded in the last portion.

## **2 Literature review**

Dash and Das (2009) Employing the CAMELS framework, researchers looked at the performance of both public and private/foreign banks in India. Information is drawn from the Capitaline database for the years 2003–2004 through 2007–2008. They looked at data from fifty-eight banks, of which twenty-nine were in the public sector and twenty-nine were in the private or foreign sector. Overall findings indicate that private and foreign banks outperformed public sector banks. Management soundness and earnings and profitability were the two CAMELS characteristics that had the greatest impact on the performance of private/foreign banks.[12]

Kaur (2010) have employed a CAMEL technique to examine the performance of Indian commercial banks. For the analysis, two ratios for each CAMEL parameter were employed. 28 banks from the public, private, and international sectors make up the sample. The results demonstrate that State Bank of Patiala and Andhra Bank are the finest public sector banks, whereas Jammu and Kashmir has been ranked first among private sector banks, followed by HDFC Bank. The top-ranked foreign sector bank is Antwerp Bank, followed by JP Morgan Chase Bank.[14]

Sangmi and Nazir (2010) undertook a study to assess the financial performance of the two biggest commercial banks operating in northern India between 2001 and 2005, namely Punjab National Bank and Jammu and Kashmir Bank, using CAMEL characteristics. They conducted the analysis using mean and standard deviation as statistical tools. Data is gathered from the corresponding banks' annual reports. According to the findings, both banks are financially sustainable and sufficient in terms of their capital sufficiency, asset quality, managerial capacity, and liquidity.[21]

Misra and Aspal (2013) Utilizing the CAMEL approach, try to look into the efficiency and stability of the state bank group's finances. Data for the analysis is gathered from the banks' publicly available annual reports for the years 2009 through 2011. For testing hypotheses and determining if a distribution is normal, they have utilised one-way ANOVA, K-S, and Shapiro-Wilk tests, respectively. The main output reveals that the various banks have achieved varied ranks with respect to CAMEL characteristics, however empirical data demonstrate that there is no statistically significant difference between the CAMEL ratios.[15]

Sayed and Sayed (2013) did the study to compare and contrast four Indian private sector banks. They employed CAMEL rating for the analysis, which covered the three-year period from 2008-09 to 2010-11, and data was gathered from the annual reports of the chosen institutions. Based on the findings, it is clear that Kotak Mahindra Bank is in the lead among other private sector banks.[22]

Gautam et al. (2014) Try to assess the six Indian banks' performance from 1996 to 2009 using the CAMEL methodology. As a statistical approach for the investigation, they employed discriminate analysis (MDA). The study's conclusions show that bank ratings overall provide a clear representation of bank performance because HDFC is rated first, followed by SBI, PNB,

BOB, and ICICI. In third place is BOI. Overall findings indicate that the MDA model may accurately predict bank failure one year before a merger.[13]

Trivedi et al.(2015) Utilizing the CAMEL rating methodology, analyse the performance of Indian public and private sector banks. The study's data comes from bank annual reports from 2009 to 2019. Four banks have been chosen for the investigation. Results indicate that various banks achieve varying rankings according to CAMEL ratios.[28]

Srinivasan and Saminathan (2016) conducted CAMEL model analyses on Indian banks operating in the public, private, and foreign sectors. The weighted average approach is utilised to rank these banks based on financial data from the years 2012 to 2014, and one-way ANOVA was also employed to test the hypothesis. 51 commercial banks have been selected for research. Their empirical findings demonstrate a statistically significant difference between the CAMEL ratios of the chosen commercial banks in India, which rated banks based on their performance.[23]

Pekkaya and Demir (2018) contend that banking is the fundamental source of financial strength in any country. Nearly all industries are impacted by banks, both directly and indirectly. It has a significant impact on how economic resources are allocated and how stable a nation's finances are. The impact and importance of banks operating in the modern economy cannot be overstated, and the variety of goods and services they offer to the public is expanding.

The CAMELS technique was approved by Georgios and Elvis as a system for evaluating the eight main Balkan banks (Georgios & Elvis, 2019). Their research supports the notion that the CAMELS rating model is crucial to the supervision of banks. The CAMEL technique was utilised by (Das & Nayak, 2020) to assess the financial performance of both public and commercial banks in Odisha, India. The CAMELS model was used as a framework for identifying and measuring the important performance characteristics for the Vietnamese commercial banks from 2009 to 2020 (Nguyen, 2021). The author further examines ten statistically significant factors, including all of the CAMELS approach's components, using the quantitative regression technique System Generalized Method of Moments (SGMM) on the findings from earlier study.

The results show a connection between bank performance and ownership type, and they recommend strengthening the stability of state-owned banks. (AL-Najjar, D.; Assous, H.F., 2021) investigated the most widely used and reliable bank rating method, the CAMEL evaluation approach [2]. In order to analyse the impact on the deposit accounts held with those banks between 2014 and 2018, the authors evaluated the performance of the eleven Saudi banks listed in the Saudi Stock Exchange All-Share Index (TASI) and graded them based on their CAMEL composite and CAMEL overall ratings. The findings demonstrate that their equity, as assessed by the CAR, management's effectiveness, return on equity, and liquidity, as measured by the loans-to-deposits ratio, all have a favourable impact on the volume of deposits held with those banks.

### 3 Objectives of Study

To analyze the performance of commercial banks operating in India using the CAMEL Model i.e., Capital Adequacy, Assets Quality, Management Quality, Earning & Liquidity.

### 4 Research Methodology

CAMEL is a ratio-based model used to evaluate the financial performance of banks. The present study used fifteen financial ratios for the analysis. Six-year average has been calculated with the help of arithmetic mean then each bank is ranked based on its performance.

Type of Research Design – Descriptive.

Sample Selection- The sample consists of 12 commercial banks of which, seven (State Bank of India, Bank Of Baroda, Bank Of India, Canara Bank, Punjab National Bank, Oriental Bank Of Commerce, Union Bank Of India) from the public sector and five (ICICI Bank Ltd, HDFC Bank Ltd, Axis Bank Ltd, Kotak Mahindra Bank Ltd. and South Indian Bank) from the private sector banks in India. Most of these banks are traded in National stock exchange.

Period of Study- The data collected for comparing the banks performances pertains for the period of six years i.e., 2014-2019.

Sources of data – The study is purely based on secondary data. This have been collected from the Statistical Tables related to banks in India available on the official website of RBI and Money Control.Com, and annual reports of the respective banks for various years have also been used.

Statistical Tools- (i) Arithmetic mean for calculating values for the purpose of performance evaluation. (ii) One-way ANOVA has been used to determine the whether there is any significant difference between the means of CAMEL ratios of public and private sector banks.

Table 1: Description of Calculated Financial Ratios Under CAMEL Model

Capital Adequacy	Assets Quality	Management Quality	Earning Quality	Liquidity
Capital Adequacy Ratio	Net NPA to Net Advances	Return on Advances	Operating Profits to Total Assets	Cash-Deposit Ratio
Capital Adequacy ratio - Tier I	Secured Advances to Total Advances	Business Per Employee	Return on Assets	Credit-Deposit Ratio
Capital Adequacy ratio - Tier II	Interest Income to Total Assets	Profit Per Employee	Net Interest Income to Total Assets	Investment-Deposit Ratio

## 5 Data Analysis and Interpretation

### 5.1. Capital Adequacy: -

**Table 1.1:** Capital Adequacy Ratio (%)

Source: Statistical Tables relating to Banks in India

Banks	Capital Adequacy Ratio (%)							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	11.98	13.86	12.92	12.44	12.00	13.12	12.72	7
Bank of Baroda	14.52	14.67	13.30	12.28	12.61	13.18	13.43	5
Bank of India	12.17	11.95	11.02	9.97	10.73	12.01	11.31	11
Canara Bank	15.38	13.76	12.40	10.63	10.56	11.08	12.30	8
Punjab National Bank	12.42	12.63	12.72	11.52	12.21	11.28	12.13	10
Oriental Bank of Commerce	14.23	12.69	12.04	11.01	11.41	11.76	12.19	9
Union Bank of India	12.95	11.85	11.45	10.80	10.22	10.56	11.31	12
ICICI Bank	19.54	18.52	18.74	17.70	17.02	16.64	18.03	1
HDFC Bank	16.22	16.52	16.80	16.07	16.79	15.53	16.32	3
Axis Bank	12.65	13.66	17.00	16.07	15.09	15.29	14.96	4
Kotak Mahindra Bank	19.92	17.52	16.05	18.83	17.17	16.34	17.64	2
South Indian Bank	14.01	14.00	13.91	12.42	12.01	11.82	13.03	6

Interpretation- In contrast to the 8% recommended in Basel protocols, the RBI requires banks to maintain a minimum Capital to Risk-weighted Assets Ratio (CRAR) of 9% with regard to credit risk, market risk, and operational risk on a continuing basis. According to table 1.1, ICICI Bank held the top spot with the highest CAR average (18.03), followed by Kotak Bank (17.64) and HDFC Banks (16.32) in second and third place, respectively. Union Bank and Bank of India both had the lowest CAR ratings (11.31) (11.31). The greater the CAR Ratio number, the healthier the bank's finances will be.

**Table 1.2:** Capital Adequacy Ratio - Tier I

Source: Statistical Tables relating to Banks in India

Banks	Capital Adequacy Ratio - Tier I							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	7.77	9.79	9.49	9.72	9.60	9.92	9.38	8
Bank of Baroda	9.99	10.83	10.13	9.28	9.87	10.79	10.15	6
Bank of India	8.33	8.59	8.20	7.24	8.17	9.03	8.26	11
Canara Bank	10.87	10.35	9.77	7.68	8.02	8.80	9.25	9

Punjab National Bank	8.44	9.28	9.76	8.87	9.30	8.41	9.01	10
Oriental Bank of Commerce	11.21	10.12	9.18	8.86	8.73	9.10	9.53	7
Union Bank of India	8.69	8.37	8.23	7.54	7.50	8.14	8.08	12
ICICI Bank	13.17	12.68	12.80	12.78	12.78	13.09	12.88	2
HDFC Bank	12.23	11.60	11.08	11.77	13.66	13.22	12.26	3
Axis Bank	9.41	9.45	12.23	12.62	12.07	12.51	11.38	4
Kotak Mahindra Bank	17.99	15.74	14.71	17.77	16.18	15.28	16.28	1
South Indian Bank	11.27	11.54	12.05	10.79	10.43	9.83	10.99	5

Interpretation- According to table 1.2, Kotak Bank held the top spot with a CAR- Tier-I average of 16.28, followed by ICICI Bank (12.88) and HDFC Banks (12.26) in second and third place, respectively. Union Bank and Bank of India both received the lowest CAR Tier-I scores (8.08). (8.26). The better for the bank's financial stability the CAR Tier-I Ratio score.

**Table 1.3:** Capital Adequacy Ratio - Tier II  
**Source:** Statistical Tables relating to Banks in India

Banks	Capital Adequacy Ratio - Tier II							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	4.21	4.07	3.43	2.72	2.40	3.20	3.34	4
Bank of Baroda	4.53	3.84	3.17	3.00	2.74	2.39	3.28	5
Bank of India	3.84	3.36	2.82	2.73	2.56	2.98	3.05	9
Canara Bank	4.51	3.41	2.63	2.95	2.54	2.28	3.05	8
Punjab National Bank	3.98	3.35	2.96	2.65	2.91	2.87	3.12	7
Oriental Bank of Commerce	3.02	2.57	2.86	2.15	2.68	2.66	2.66	10
Union Bank of India	4.26	3.48	3.22	3.26	2.72	2.42	3.23	6
ICICI Bank	6.37	5.84	5.94	4.92	4.24	3.65	5.16	1
HDFC Bank	3.99	4.92	5.72	4.30	3.13	2.31	4.06	2
Axis Bank	3.24	4.21	4.77	3.45	3.02	2.78	3.58	3
Kotak Mahindra Bank	1.93	1.78	1.34	1.06	0.99	1.06	1.36	12
South Indian Bank	2.74	2.46	1.86	1.63	1.58	1.99	2.04	11

Interpretation- According to table 1.3, ICICI Bank held the top spot with the highest average of CAR-Tier-II scores (5.16), followed by HDFC Bank (4.06) and Axis Banks (3.58) in that order. Kotak Bank received the lowest CAR Tier-II score (1.36). The greater the CAR Tier-II Ratio rating, the healthier the bank's finances will be.

**Table 1.4:** Composite Capital Adequacy

Source: Authors calculation

Banks	CAR		Capital adequacy ratio - Tier I		Capital adequacy ratio - Tier II		Group Rank	
	%	Rank	%	Rank	%	Rank	Avg	Rank
State Bank of India	12.72	7	9.38	8	3.34	4	6.33	6
Bank of Baroda	13.43	5	10.15	6	3.28	5	5.33	5
Bank of India	11.31	11	8.26	11	3.05	9	10.33	12
Canara Bank	12.30	8	9.25	9	3.05	8	8.33	8
Punjab National Bank	12.13	10	9.01	10	3.12	7	9.00	10
Oriental Bank of Commerce	12.19	9	9.53	7	2.66	10	8.67	9
Union Bank of India	11.31	12	8.08	12	3.23	6	10.00	11
ICICI Bank	18.03	1	12.88	2	5.16	1	1.33	1
HDFC Bank	16.32	3	12.26	3	4.06	2	2.67	2
Axis Bank	14.96	4	11.38	4	3.58	3	3.67	3
Kotak Mahindra Bank	17.64	2	16.28	1	1.36	12	5.00	4
South Indian Bank	13.03	6	10.99	5	2.04	11	7.33	7

Interpretation- Based on a review of the group averages for the three capital adequacy ratios shown in Table 1.4. The results show that ICICI Bank took the top spot with a group average rank of 1.33, followed by HDFC Bank (2.67) and Axis Banks (3.67) in that order. Due to its poor performance in all three measures, Bank of India received the lowest ranking, with a group average rating of 10.33.

## 5.2. Asset Quality: -

**Table 2.1:** Ratio of Net NPA to Net Advances

Source: Statistical Tables relating to Banks in India

Banks	Net NPA To Net Advances							Avg	Rank
	2014	2015	2016	2017	2018	2019			
State Bank of India	1.63	1.82	2.10	2.57	2.12	3.81	2.34	7	
Bank of Baroda	0.35	0.54	1.28	1.52	1.89	5.06	1.77	6	
Bank of India	0.91	1.47	2.06	2.00	3.36	7.79	2.93	10	
Canara Bank	1.10	1.46	2.18	1.98	2.65	6.42	2.63	9	
Punjab National Bank	0.85	1.52	2.35	2.85	4.06	8.61	3.37	12	
Oriental Bank of Commerce	0.98	2.21	2.27	2.82	3.34	6.70	3.05	11	
Union Bank of India	1.19	1.70	1.61	2.33	2.71	5.25	2.47	8	
ICICI Bank	1.11	0.73	0.77	0.97	1.61	2.98	1.36	5	

HDFC Bank	0.19	0.18	0.20	0.27	0.25	0.28	0.23	1
Axis Bank	0.29	0.27	0.36	0.44	0.46	0.74	0.43	2
Kotak Mahindra Bank	0.72	0.61	0.64	1.08	0.92	1.06	0.84	3
South Indian Bank	0.29	0.28	0.78	0.78	0.96	2.89	1.00	4

Interpretation- According to the study in table 2.1, HDFC Bank came in first with the lowest average score of 0.23, followed by Axis Bank (0.43) and Kotak Bank (.84) on the second and third spots, respectively. The lowest ranking Punjab National Bank has a best average of 3.37. The bank's financial situation is improved by a decreased Net NPA to Net Advances ratio.

**Table 2.2:** Ratio of secured advances to total advances

Source: Statistical Tables relating to Banks in India

Banks	Secured Advances to Total Advances							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	79.78	81.04	82.64	83.55	80.07	78.43	80.92	10
Bank of Baroda	78.53	83.67	87.28	86.29	87.47	88.22	85.24	4
Bank of India	76.37	78.94	85.92	82.11	85.01	84.09	82.07	7
Canara Bank	69.53	75.47	82.59	83.72	82.81	86.05	80.03	11
Punjab National Bank	87.61	91.61	92.09	93.46	94.12	92.95	91.97	3
Oriental Bank of Commerce	87.82	92.68	93.58	93.65	93.78	91.33	92.14	2
Union Bank of India	78.79	78.57	85.74	88.90	87.37	86.77	84.36	5
ICICI Bank	78.88	84.82	85.91	85.62	86.26	82.71	84.03	6
HDFC Bank	75.51	75.54	76.24	77.55	76.58	76.90	76.39	12
Axis Bank	81.70	86.44	82.84	83.43	79.27	76.37	81.68	8
Kotak Mahindra Bank	85.51	83.37	85.46	79.27	78.10	76.86	81.43	9
South Indian Bank	89.63	93.16	92.81	95.07	94.07	94.50	93.21	1

Interpretation- According to the research in table 2.2, South Indian Bank's assets quality (93.21) is much higher than that of other banks. With an average of 92.14, Oriental Bank of Commerce came in second, followed by Punjab National Bank (91.97) and Bank of Baroda (85.24). HDFC Bank is in last place with the lowest average value of (76.39).

**Table 2.3:** Ratio of Interest Income to Total Assets

Source: Statistical Tables relating to Banks in India

Banks	Interest Income to Total Assets							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	7.15	8.32	8.25	8.12	7.94	7.60	7.90	9
Bank of Baroda	6.87	7.37	7.08	6.45	6.25	6.36	6.73	12
Bank of India	6.95	7.74	7.62	7.39	7.29	6.80	7.30	11
Canara Bank	7.64	8.69	8.67	8.75	8.41	8.00	8.36	6



Punjab National Bank	8.00	8.72	8.94	8.40	8.03	7.46	8.26	7
Oriental Bank of Commerce	8.09	9.33	9.36	9.03	8.86	8.57	8.87	4
Union Bank of India	7.63	8.44	8.75	8.81	8.73	8.19	8.43	5
ICICI Bank	6.75	7.49	7.81	7.81	7.91	7.72	7.58	10
HDFC Bank	7.97	9.06	9.50	9.22	8.96	9.27	9.00	3
Axis Bank	7.16	8.33	8.68	8.47	8.40	8.30	8.22	8
Kotak Mahindra Bank	9.49	10.61	10.77	10.24	10.04	10.99	10.36	1
South Indian Bank	8.38	9.79	9.84	9.57	9.27	9.09	9.32	2

Interpretation- Kotak Bank placed first with the highest average value (10.36), followed by South Indian Bank (9.32) and HDFC Bank (9.00) on second and third place, respectively, according to Table 2.3. With a score of 6.73, Bank of Baroda is in last place, followed by Bank of India and ICICI Bank, respectively.

**Table 2.4:** Composite Assets Quality  
Source: Authors calculation

Banks	Net NPA to Net Advances		Secured Advances to Total Advances		Interest Income to Total Assets		Group Rank	
	%	Rank	%	Rank	%	Rank	Avg	Rank
State Bank of India	2.34	7	80.92	10	7.90	9	8.67	10
Bank of Baroda	1.77	6	85.24	4	6.73	12	7.33	8
Bank of India	2.93	10	82.07	7	7.30	11	9.33	12
Canara Bank	2.63	9	80.03	11	8.36	6	8.67	10
Punjab National Bank	3.37	12	91.97	3	8.26	7	7.33	8
Oriental Bank of Commerce	3.05	11	92.14	2	8.87	4	5.67	4
Union Bank of India	2.47	8	84.36	5	8.43	5	6.00	5
ICICI Bank	1.36	5	84.03	6	7.58	10	7.00	7
HDFC Bank	0.23	1	76.39	12	9.00	3	5.33	3
Axis Bank	0.43	2	81.68	8	8.22	8	6.00	5
Kotak Mahindra Bank	0.84	3	81.43	9	10.36	1	4.33	2
South Indian Bank	1.00	4	93.21	1	9.32	2	2.33	1

Interpretation- Based on a review of the group averages for the three asset quality ratios presented in Table 2.4. The results show that South Indian Bank took the top spot with a group average rank of 2.33, followed by Kotak Bank (4.33) and HDFC Banks (5.33) in that order. Due to its subpar performance in all three measures, Bank of India received the lowest ranking, with a 9.33 group average rank

### 5.3 Management Quality:

**Table 3.1: Return on Advances**

Source: Statistical Tables relating to Banks in India

Banks	Return on Advances							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	8.64	9.98	9.46	9.09	8.95	8.37	9.08	10
Bank of Baroda	8.02	8.67	8.40	7.69	7.47	7.34	7.93	12
Bank of India	8.12	8.76	8.60	8.22	8.20	7.98	8.31	11
Canara Bank	8.96	10.57	10.27	10.48	10.16	9.58	10.00	5
Punjab National Bank	9.85	10.61	10.57	9.84	9.54	8.69	9.85	6
Oriental Bank of Commerce	9.98	11.62	11.42	10.87	10.65	10.06	10.77	4
Union Bank of India	8.90	9.75	9.92	9.95	9.89	9.05	9.58	8
ICICI Bank	8.26	9.42	10.05	9.99	9.81	9.47	9.50	9
HDFC Bank	10.56	11.89	12.33	11.68	11.12	10.80	11.40	3
Axis Bank	8.43	9.85	10.45	10.28	10.12	9.69	9.80	7
Kotak Mahindra Bank	12.83	14.23	14.04	13.15	12.53	13.49	13.38	1
South Indian Bank	10.63	12.01	12.10	11.61	11.28	11.12	11.46	2

Interpretation- This ratio shows how effectively and productively a specific bank uses its human resources. Kotak Bank came in first with the highest average of 13.38, as shown in table 3.1, and was followed by South Indian Bank (11.46). Bank of Baroda is in the bottom spot with a 7.93 average.

**Table 3.2: Business Per Employee (in Rupees Million)**

Source: Statistical Tables relating to Banks in India

Banks	Business Per Employee (in Rupees Million)							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	70.47	79.84	94.39	106.38	123.40	141.10	102.60	9
Bank of Baroda	122.90	146.60	168.90	186.50	188.90	168.00	163.63	2
Bank of India	128.40	136.00	158.20	196.30	206.90	179.60	167.57	1
Canara Bank	119.91	137.44	142.02	143.84	143.50	144.46	138.53	4
Punjab National	101.78	113.20	116.51	128.30	131.90	135.90	121.27	7

Bank								
Oriental Bank of Commerce	141.80	146.22	162.03	170.97	174.25	168.87	160.69	3
Union Bank of India	104.30	107.00	121.50	137.60	144.60	155.10	128.35	6
ICICI Bank	73.50	70.80	73.50	74.70	83.20	94.30	78.33	11
HDFC Bank	65.30	65.40	75.00	89.00	101.00	113.90	84.93	10
Axis Bank	136.60	127.60	121.50	123.00	137.10	148.40	132.37	5
Kotak Mahindra Bank	53.50	61.30	68.60	67.80	70.50	75.10	66.13	12
South Indian Bank	91.80	107.90	120.10	119.90	115.40	125.50	113.43	8

Interpretation- This ratio shows how effectively and productively a specific bank uses its human resources. Table 3.2 shows that Bank of India came in first with an average of 167.57 million, followed by Bank of Borda (163.63 million) and Oriental Bank of Commerce (160.69 million), which came in second and third, respectively. With a score of 66.13 Million, Kotak Bank is in last place. The performance of the bank is improved by a larger Business per Employee Ratio.

**Table 3.3:** Profit Per Employee (in Rupees Million)

**Source:** Statistical Tables relating to Banks in India

Banks	Profit Per Employee (in Rupees Million)							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	0.39	0.53	0.65	0.49	0.60	0.47	0.52	8
Bank of Baroda	1.10	1.20	1.00	1.00	0.70	-1.00	0.67	5
Bank of India	0.62	0.64	0.64	0.63	0.37	-1.22	0.28	12
Canara Bank	0.98	0.82	0.70	0.50	0.50	-0.50	0.50	10
Punjab National Bank	0.84	0.84	0.81	0.50	0.50	-0.60	0.48	11
Oriental Bank of Commerce	0.90	0.62	0.70	0.58	0.25	0.07	0.52	9
Union Bank of India	0.80	0.60	0.70	0.50	0.50	0.40	0.58	7
ICICI Bank	1.00	1.10	1.40	1.40	1.60	1.40	1.32	2
HDFC Bank	0.74	0.80	1.00	1.20	1.00	1.50	1.04	3
Axis Bank	1.40	1.40	1.50	1.50	1.70	1.80	1.55	1
Kotak Mahindra Bank	0.80	0.90	1.00	1.00	1.10	0.70	0.92	4
South Indian Bank	0.50	0.70	0.80	0.70	0.40	0.40	0.58	6

Interpretation- This ratio shows how effectively and productively a specific bank uses its human resources. Axis Bank was placed first with the highest average of 1.55 million, followed by ICICI Bank (1.32 million), HDFC Bank (1.04 million), and Kotak Bank (.92 million) in that order in table 3.3. The lowest rank was achieved by Bank of India, which received a score of.28 Million. The efficiency of the bank in maximising profit increases with the ratio of profit to employees.

**Table 3.4:** Composite Management Quality  
**Source:** Authors calculation

Banks	Return on Advances		Business Per Employee		Profit Per Employee		Group Rank	
	%	Rank	Million	Rank	Million	Rank	Avg	Rank
State Bank of India	9.08	10	102.60	9	0.52	8	9.00	12
Bank of Baroda	7.93	12	163.63	2	0.67	5	6.33	6
Bank of India	8.31	11	167.57	1	0.28	12	8.00	10
Canara Bank	10.00	5	138.53	4	0.50	10	6.33	6
Punjab National Bank	9.85	6	121.27	7	0.48	11	8.00	10
Oriental Bank of Commerce	10.77	4	160.69	3	0.52	9	5.33	2
Union Bank of India	9.58	8	128.35	6	0.58	7	7.00	8
ICICI Bank	9.50	9	78.33	11	1.32	2	7.33	9
HDFC Bank	11.40	3	84.93	10	1.04	3	5.33	2
Axis Bank	9.80	7	132.37	5	1.55	1	4.33	1
Kotak Mahindra Bank	13.38	1	66.13	12	0.92	4	5.67	5
South Indian Bank	11.46	2	113.43	8	0.58	6	5.33	2

Interpretation- Based on a review of the group averages for the three management quality ratios as shown in Table 3.4. With a group average score of 4.33, Axis Bank came in first, followed by HDFC Bank, South Indian Bank, and Oriental Bank of Commerce, in that order. As a result of its subpar performance in all three measures, State Bank of India received the lowest ranking, with a group average rating of 9.00.

#### 5.4 Earning Quality:-

**Table 4.1:** Ratio of Operating Profits to Total Assets

**Source:** Statistical Tables relating to Banks in India

Banks	Operating Profits to Total Assets							Avg	Rank
	2014	2015	2016	2017	2018	2019			

State Bank of India	2.23	2.47	2.14	1.91	2.10	2.01	2.14	6
Bank of Baroda	2.19	2.13	1.81	1.54	1.44	1.27	1.73	9
Bank of India	1.72	1.82	1.78	1.64	1.26	0.98	1.53	12
Canara Bank	2.03	1.67	1.50	1.50	1.34	1.30	1.56	11
Punjab National Bank	2.68	2.54	2.33	2.21	2.07	1.92	2.29	5
Oriental Bank of Commerce	2.17	1.85	1.95	1.97	1.75	1.57	1.88	7
Union Bank of India	2.00	2.11	1.94	1.57	1.58	1.44	1.77	8
ICICI Bank	2.35	2.32	2.57	2.93	3.18	3.49	2.81	4
HDFC Bank	3.09	3.05	3.10	3.22	3.22	3.29	3.16	1
Axis Bank	3.03	2.81	2.97	3.17	3.17	3.26	3.07	2
Kotak Mahindra Bank	3.00	2.84	2.89	3.01	3.10	2.71	2.93	3
South Indian Bank	1.80	1.78	1.88	1.69	1.55	1.44	1.69	10

Interpretation- This ratio shows how much money a bank makes from its operations after covering operating expenses for each asset investment. Operating profit divided by total assets is used to calculate it. According to table 4.1, HDFC Bank came in first with an average of 3.16, followed by Axis Bank (3.17) and Kotak Bank (2.93), in that order. The lowest ratio, 1.53, belongs to Bank of India.

**Table 4.2:** Return on Assets

**Source:** Statistical Tables relating to Banks in India

Banks	Return on Assets							Rank
	2014	2015	2016	2017	2018	2019	Avg	
State Bank of India	0.71	0.88	0.97	0.65	0.68	0.46	0.73	6
Bank of Baroda	1.33	1.24	0.90	0.75	0.49	-0.78	0.66	9
Bank of India	0.82	0.72	0.65	0.51	0.27	-0.94	0.34	12
Canara Bank	1.42	0.95	0.77	0.54	0.55	-0.52	0.62	10
Punjab National Bank	1.34	1.19	1.00	0.64	0.53	-0.61	0.68	7
Oriental Bank of Commerce	1.03	0.67	0.71	0.56	0.23	0.07	0.55	11
Union Bank of India	1.05	0.79	0.79	0.52	0.49	0.35	0.67	8
ICICI Bank	1.35	1.50	1.70	1.78	1.86	1.49	1.61	4
HDFC Bank	1.58	1.77	1.90	2.00	2.02	1.92	1.87	1
Axis Bank	1.68	1.68	1.70	1.78	1.83	1.72	1.73	2
Kotak Mahindra Bank	1.77	1.83	1.81	1.80	1.98	1.19	1.73	3

South Indian Bank	1.05	1.12	1.17	1.00	0.56	0.55	0.91	5
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Interpretation- Return on Assets is a gauge of a bank's profitability. It is determined by dividing net profit after tax by total assets. In table 4.2, HDFC Bank was ranked first with an average of 1.87, followed by Axis Bank (1.73) and Kotak Bank (1.73), in that order. The Bank of India had the lowest ranking with a score of 0.34 on average.

**Table 4.3:** Ratio of Net Interest Income to Total Assets (Net Interest Margin)

**Source:** Statistical Tables relating to Banks in India

Banks	Net Interest Income to Total Assets (Net Interest Margin)							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	2.86	3.38	3.06	2.93	2.86	2.64	2.96	5
Bank of Baroda	2.76	2.56	2.28	1.98	1.92	1.84	2.22	10
Bank of India	2.49	2.26	2.16	2.11	1.91	1.91	2.14	11
Canara Bank	2.56	2.17	2.00	1.98	1.86	1.77	2.06	12
Punjab National Bank	3.50	3.21	3.17	3.14	2.87	2.41	3.05	4
Oriental Bank of Commerce	2.80	2.49	2.49	2.44	2.26	2.30	2.46	9
Union Bank of India	2.88	2.73	2.63	2.37	2.30	2.11	2.50	8
ICICI Bank	2.34	2.40	2.70	2.91	3.07	3.11	2.76	6
HDFC Bank	4.22	4.19	4.28	4.14	4.14	4.25	4.20	2
Axis Bank	3.10	3.04	3.09	3.30	3.37	3.41	3.22	3
Kotak Mahindra Bank	4.75	4.31	4.29	4.34	4.36	4.63	4.45	1
South Indian Bank	2.71	2.79	2.84	2.67	2.39	2.47	2.65	7

Interpretation- The ratio of net interest income to total assets is used to measure it (Net Interest Margin). A greater ratio suggests that the bank is more profitable. In table 4.3, Kotak Bank was rated first with an average of 4.45, followed by HDFC Bank (4.20) and Axis Bank (3.22), in that order. Canara Bank had the lowest ranking and the lowest average score (2.06).

**Table 4.4:** Composite Earning Quality

**Source:** Authors calculation

Banks	Operating Profits to Total Assets	Return on Assets	Net Interest Income to Total Assets	Group Rank

	%	Rank	%	Rank	%	Rank	Avg	Rank
State Bank of India	2.14	6	0.73	6	2.96	5	5.67	6
Bank of Baroda	1.73	9	0.66	9	2.22	10	9.33	10
Bank of India	1.53	12	0.34	12	2.14	11	11.67	12
Canara Bank	1.56	11	0.62	10	2.06	12	11.00	11
Punjab National Bank	2.29	5	0.68	7	3.05	4	5.33	5
Oriental Bank of Commerce	1.88	7	0.55	11	2.46	9	9.00	9
Union Bank of India	1.77	8	0.67	8	2.50	8	8.00	8
ICICI Bank	2.81	4	1.61	4	2.76	6	4.67	4
HDFC Bank	3.16	1	1.87	1	4.20	2	1.33	1
Axis Bank	3.07	2	1.73	2	3.22	3	2.33	2
Kotak Mahindra Bank	2.93	3	1.73	3	4.45	1	2.33	2
South Indian Bank	1.69	10	0.91	5	2.65	7	7.33	7

Interpretation- Based on a review of the group averages for the three earning quality ratios as shown in Table 4.4. It was discovered that HDFC Bank came in first place with a group average rank of 1.33, followed by Axis Bank and Kotak Bank (2.33) in that order. Due to its poor performance in all three measures, Bank of India received the lowest ranking, with a group average rating of 11.67.

#### 5.5 Liquidity:-

“Cash-Deposit Ratio is the ratio of how much a bank lends out of the deposits it has mobilized. It indicates how much of a bank’s core funds are being used for lending, the main banking activity. It can also be defined as total of cash in hand and balance with RBI divided by total deposit.” (RBI 2005 to 2016. It ensures customer that they will be able to take their money out of the bank if they want to.

**Table 5.1** Cash-Deposit Ratio

Source: Statistical Tables relating to Banks in India

Banks	Cash-Deposit Ratio							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	10.11	5.18	5.47	6.09	7.35	7.49	6.95	2
Bank of Baroda	6.50	5.63	2.84	3.27	3.64	3.78	4.28	12
Bank of India	7.29	4.71	5.75	4.00	5.11	6.62	5.58	6
Canara Bank	7.50	5.44	4.33	5.27	4.64	4.31	5.25	10
Punjab National Bank	7.60	4.87	4.57	4.93	4.83	4.78	5.26	9
Oriental Bank of Commerce	6.84	5.43	4.65	5.16	4.99	4.52	5.27	8
Union Bank of India	8.70	5.22	4.08	6.19	4.75	4.55	5.58	5
ICICI Bank	9.27	8.01	6.51	6.57	7.10	6.43	7.32	1
HDFC Bank	12.03	6.08	4.94	6.90	6.10	5.50	6.93	3
Axis Bank	7.34	4.86	5.86	6.07	6.15	6.25	6.09	4
Kotak Mahindra Bank	7.20	5.23	4.33	4.99	5.25	4.98	5.33	7
South Indian Bank	6.15	4.31	3.83	4.63	4.70	4.44	4.68	11

Interpretation- It is found in table 5.1 that ICICI Bank ranked on the top position with the highest average of 7.32 followed by State Bank of India (6.95) and HDFC Bank (6.93) respectively. Bank of Baroda scored the lowest position with least average of 4.28.

**Table 5.2:** Credit-Deposit Ratio

Source: Statistical Tables relating to Banks in India

Banks	Credit-Deposit Ratio							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	81.03	83.13	86.94	86.76	82.45	84.57	84.15	3
Bank of Baroda	74.87	74.67	69.25	69.79	69.32	66.85	70.79	11
Bank of India	71.30	78.20	75.78	77.73	75.58	70.02	74.77	8
Canara Bank	72.00	71.09	68.05	71.56	69.65	67.68	70.01	12
Punjab National Bank	77.38	77.39	78.86	77.38	75.90	74.55	76.91	7
Oriental Bank of Commerce	68.97	71.80	73.31	71.88	71.20	71.26	71.40	10
Union Bank of	74.58	79.81	78.90	76.96	80.68	78.01	78.16	6



India								
ICICI Bank	95.91	99.31	99.19	102.05	107.18	103.28	101.15	1
HDFC Bank	76.70	79.21	80.92	82.49	81.08	85.02	80.90	5
Axis Bank	75.25	77.13	77.97	81.89	87.17	94.64	82.34	4
Kotak Mahindra Bank	100.23	101.41	94.98	89.77	88.38	85.59	93.39	2
South Indian Bank	68.94	74.74	71.88	76.29	72.03	73.74	72.94	9

Interpretation- The credit-deposit ratio reveals the loans made by banks using their deposits. Table 5.2 shows that ICICI Bank came in first with an average of 101.15, followed by Kotak Bank (93.39) and State Bank of India (84.15), in that order. Canara Bank had the lowest ranking and the lowest average score (70.01).

**Table 5.3: Investment-Deposit Ratio**  
**Source: Statistical Tables relating to Banks in India**

Banks	Investment-Deposit Ratio							
	2014	2015	2016	2017	2018	2019	Avg	Rank
State Bank of India	31.65	29.91	29.17	28.60	30.55	27.57	29.58	8
Bank of Baroda	23.38	21.62	25.62	20.41	18.92	20.98	21.82	12
Bank of India	28.73	27.26	24.78	23.93	22.52	23.17	25.07	11
Canara Bank	28.50	31.21	34.04	30.15	29.98	29.66	30.59	7
Punjab National Bank	30.41	32.33	33.17	31.85	29.89	28.54	31.03	6
Oriental Bank of Commerce	35.63	33.41	33.29	31.77	30.41	31.43	32.66	5
Union Bank of India	28.84	27.98	30.65	31.49	26.66	26.03	28.61	9
ICICI Bank	59.70	62.45	58.57	53.33	43.73	38.06	52.64	1
HDFC Bank	34.00	39.51	37.68	32.93	33.64	29.99	34.63	4
Axis Bank	38.04	42.34	45.02	40.42	36.46	34.08	39.39	3
Kotak Mahindra Bank	58.51	55.96	56.58	43.14	38.28	36.97	48.24	2
South Indian Bank	30.03	25.75	28.29	30.22	27.13	26.24	27.94	10

Interpretation- The investment-deposit ratio shows the advances that banks have lent through their deposits. Table 5.3 shows that ICICI Bank came in first with an average of 52.64, followed by Kotak Bank (48.24), and AXIS BANK (39.39), in that order. Bank of Baroda had the lowest ranking and the lowest overall average (21.82).

**Table 5.4: Composite Liquidity**

Banks	Cash-Deposit Ratio		Credit-Deposit Ratio		Investment-Deposit Ratio		Group Rank	
	%	Rank	%	Rank	%	Rank	Avg	Rank
State Bank of India	6.95	2	84.15	3	29.58	8	4.33	5
Bank of Baroda	4.28	12	70.79	11	21.82	12	11.67	12
Bank of India	5.58	6	74.77	8	25.07	11	8.33	9
Canara Bank	5.25	10	70.01	12	30.59	7	9.67	10
Punjab National Bank	5.26	9	76.91	7	31.03	6	7.33	7
Oriental Bank of Commerce	5.27	8	71.40	10	32.66	5	7.67	8
Union Bank of India	5.58	5	78.16	6	28.61	9	6.67	6
ICICI Bank	7.32	1	101.15	1	52.64	1	1.00	1
HDFC Bank	6.93	3	80.90	5	34.63	4	4.00	4
Axis Bank	6.09	4	82.34	4	39.39	3	3.67	2
Kotak Mahindra Bank	5.33	7	93.39	2	48.24	2	3.67	2
South Indian Bank	4.68	11	72.94	9	27.94	10	10.00	11

Interpretation- Based on a review of the group averages for the three liquidity ratios presented in Table 5.4. With a group average rank of 1.00, it was discovered that ICICI Bank came in first, followed by Axis Bank and Kotak Bank (3.67). Due to its subpar performance in all three measures, Bank of Boroda received the lowest ranking with a group average rating of 11.67.

### 5.6 Composite Ranking of Selected Commercial Banks

Banks	C	A	M	E	L	Average	Rank
State Bank of India	6.33	8.67	9.00	5.67	4.33	6.80	<b>6</b>
Bank of Baroda	5.33	7.33	6.33	9.33	11.67	8.00	<b>10</b>
Bank of India	10.33	9.33	8.00	11.67	8.33	9.53	<b>12</b>
Canara Bank	8.33	8.67	6.33	11.00	9.67	8.80	<b>11</b>
Punjab National Bank	9.00	7.33	8.00	5.33	7.33	7.40	<b>8</b>
Oriental Bank of Commerce	8.67	5.67	5.33	9.00	7.67	7.27	<b>7</b>
Union Bank of India	10.00	6.00	7.00	8.00	6.67	7.53	<b>9</b>
ICICI Bank	1.33	7.00	7.33	4.67	1.00	4.27	<b>4</b>

HDFC Bank	2.67	5.33	5.33	1.33	4.00	3.73	<b>1</b>
Axis Bank	3.67	6.00	4.33	2.33	3.67	4.07	<b>2</b>
Kotak Mahindra Bank	5.00	4.33	5.67	2.33	3.67	4.13	<b>3</b>
South Indian Bank	7.33	2.33	5.33	7.33	10.00	6.47	<b>5</b>

**Source:** Authors Calculation

Interpretation- We developed a composite rating in order to evaluate the overall effectiveness of public and private sector banks, and the findings are shown in Table 5.6. depicts the public and private sector banks' group rankings from 2011 to 2016. According to the criteria for capital adequacy ratios, ICICI Bank came in first, while Bank of India came in last. South Indian Bank ranked highest on the assets quality criterion, while Bank of India received the lowest ranking. Axis Bank was ranked highest and State Bank of India was ranked lowest in terms of management effectiveness. HDFC Bank ranked first in terms of the earning quality criterion, while Bank of India received the lowest score. Under the liquidity parameter ICICI Bank stood on the top position and Bank of Baroda was on the lowest position. Taking a consolidated view, it can be depicted from the analysis that HDFC bank is at the top position followed by Axis bank. Kotak bank occupied the third position and last position is occupied by Bank of India amongst all the selected banks during the period of 2011-2016.

## 6 Conclusion

CAMEL model is considered as an important tool to analyze the financial performance of the banks and suggest necessary measures to improve their performance over their weaknesses. This study is done to analyze and compare the performance of public and private sector banks during the period of 2014 - 2019 by using the CAMEL rating technique. This study consists of a sample of 12 commercial banks operating in India out of which seven were public sector banks and five were private sector banks. From the result of data analysis and interpretation, it is found that in terms of capital adequacy ratios, ICICI Bank came out on top, while Bank of India received the lowest ranking. South Indian Bank ranked highest for the assets quality criterion, while Bank of India received the lowest ranking. Axis Bank came out on top in the managerial efficiency metric, while State Bank of India received the lowest score. HDFC Bank ranked first in terms of the earning quality criterion, while Bank of India received the lowest score. Bank of Baroda was ranked last and ICICI Bank was ranked first under the liquidity criterion. When looking at the data as a whole, it is clear from the study that HDFC Bank is in the lead, followed by Axis Bank.

Out of all the chosen banks, Kotak Bank held the third rank, and Bank of India had the final spot. Results indicate that private sector banks perform better than public sector banks. Therefore, public sector banks must increase their performance in order to reach the top positions and the necessary level.

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