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Dr. Nidhi
Associate Professor, Gargi College, University of Delhi, New Delhi, India

Nupur Tyagi
M.Com Student, Department of Commerce, Delhi School of Economics, New Delhi, India

Correspondence
Dr. Nidhi
Associate Professor, Gargi College, University of Delhi, New Delhi, India

A CAMEL model analysis of private sector banks

Dr. Nidhi and Nupur Tyagi

Abstract
Banking is an institution that deals in money and credit, safeguards the public's savings, and grants borrowers' loans and advances. Banks are the lifeline of any economy and are responsible for maintaining its financial stability. The sound financial health of the banking system is of significant importance to all its stakeholders, *viz*., its depositors, shareholders, employees and the general public. However, after the financial frauds observed in some banks lately, Indian depositors are concerned about their deposits' safety. Depositors are now concerned with evaluating banks' strength, security, and stability. The current study looks at the top six Indian private banks from 2015-16 to 2017-18 (according to the value of their total assets). The data is analysed using the CAMEL Model to measure the performance of the banks based on the five parameters: Capital adequacy, Asset quality, Management, Earnings, and Liquidity. The model illustrates the bank's total financial health and makes comparative research through bank rankings easier. The CAMEL model revealed IndusInd Bank, HDFC Bank, and Kotak Mahindra Bank as the top-performing banks.

Keywords: Banking system, financial performance, private banks, CAMEL model, ratio analysis

1. Introduction

An institution that deals with money and credit is banking. It provides loans and advances to borrowers while protecting the public's savings. It is essential for fostering a nation's economic development. Banking Companies Act 1949 defines banking as accepting for lending or depositing money from the public, repayable on demand or otherwise and withdrawable by cheque draft or otherwise. Banks are a nation's dominant financial institutions and vital structural pillars, maintaining the country's economic stability. They serve as a bridge between savers and borrowers, laying the groundwork for a strong financial industry. We may say unequivocally that the financial system symbolizes the country's economy's strength.

Public sector banks have subjugated India since the nationalization of banks in 1969 and 1980. The RBI approved ten private banks after the economic liberalization in 1991, allowing private players to enter the banking industry. RBI granted licences to Kotak Mahindra Bank and Yes Bank in 2003 and 2004, respectively, and clearance to IDFC and Bandhan Financial Services to open banks in 2014. The private sector banks reemerged and earned a reputation as the new generation of technologically advanced banks. Since then, they have expanded more quickly thanks to modern and sophisticated technology, offering the best customer service and the most recent advances in the banking sector. The RBI also unveiled fresh ideas, like small financing banks and payment systems.

However, after the ICICI and IDBI money laundering case, PNB scam case, PMC bank fraud episode & Yes Bank fiasco, Indian depositors are majorly concerned over the safety of the deposits in their banks. As a result, actions have often been taken to assess the financial position of individual banks. The CAMEL rating system is one such frequently utilized measurement. The CELS or CAMELS rating is a supervisory rating system initially developed in the US in 1979 to assess a bank's overall condition. It is a ratio-based approach that aids in evaluating bank performance based on five components: Capital adequacy, Asset quality, Management, Earnings, and Liquidity. RBI adopted this model in 1996 on the recommendations of the Padmanabham Working Group committee to analyze the performance of Indian commercial banks and foreign banks operating in India. The CAMEL ranking is used to assess a bank's financial strength and soundness compared to other banks. It facilitates comparative examination through rankings and aids in describing the bank's overall condition.

2. Literature Review

Kumar *et al*., 2012 [6]; Mathiraj and Ramya, 2014 [8]; Kumar and Malhotra, 2017 [7]; Talreja and Shivappa, 2016 [12]; studied the financial performance of various private banks in India with the help of the CAMEL model. They observed that private-sector banks are more economically solvent than public banks. Sharma and Arora (2016) 10[] examined fifteen institutions for the period of 2014–2015, eight of which were public sector banks and seven of which were private sector banks. They observed comparable results.

Conversely, few other studies have examined public sector banks' financial performance. Aspal and Malhotra (2012) [1] evaluated the financial performance of all the public sector banks other than the state bank of India for five years, from 2007 to 2011, using the CAMEL approach. According to their analysis Bank of Baroda was on top in financial performance, and United Bank was last. Gupta 2014; and Biswas 2014 too investigated the public sector banks using the CAMEL model. The former study concluded that Andhra Bank topped the list, followed by the Bank of Baroda and State Bank of Hyderabad, with the United Bank of India taking the final position. The findings revealed that the Andhra Bank fared significantly better regarding management effectiveness and earning quality. According to Kaur *et al*. (2015) [4], the CAMEL approach helps evaluate and compare bank performance from the perspectives of investors and depositors. They assessed the performance of the top five public sector banks based on the model's parameters for 2009-14 and concluded that the Bank of Baroda was at the top, followed by Punjab National bank.

Several other studies, *viz.* Srinivasan and Saminathan, 2016 [11]; Meena, 2016 [9]; compared the private and public sector banks. These investigations demonstrated noticeable differences between the CAMEL ratios of the selected Indian public sector banks, private sector banks, and foreign banks. The study's findings also reveal that private-sector banks outperform public-sector banks because the former obtained the highest scores. They also looked at the bank's performance over three years to see how the global financial crisis and BASEL rules affected the banking sector. They observed that private-sector banks outperform government-owned banks in terms of stability, consistency, resilience, and proactivity.

3. The Present Study

A literature survey finds that current studies evaluate banks using the CAMEL model, only considering a small number of public and private sector banks or comparing the performance of the two sectors. Few studies have examined the relative economic strength of the leading private banks listed on the stock exchange and their financial status, performance, and efficiency. Given the above, the objective of this study is

- To appraise and assess the working and performance of the top five listed private banks in India (as per the value of total assets) using the CAMEL model;
- To compare and analyse the performance of Private Banks with each other based on the parameters calculated

Following the value of the bank's total assets as listed on BSE, we have chosen the top six private banks. The banks included in the study are HDFC Bank, ICICI Bank, Axis Bank, Yes Bank, Kotak Mahindra Bank and IndusInd Bank. The study relies on secondary data collected from the banks' annual reports & financial statements available on the individual bank websites. The financial strength of the chosen banks has been examined using the CAMEL model. Selected Ratios have been calculated for each acronym or parameter of CAMEL for each bank. To draw a conclusion using comparative analysis based on the model's parameters, averages and Composite ranking have been utilized. The CAMEL ranking technique has been applied to all ratios to estimate the relative positions of the banks. First, all the private banks in the list have been ranked on each sub-parameter under the model's primary parameter. Then, the ranks for each sub-parameter are combined by a simple average to calculate the group rank and determine the bank's performance in a particular parameter vis-a-vis the other banks in the list. To determine the total or composite position based on the CAMEL model and evaluate the overall performance of the banks, ranks for each main parameter have been assessed and then merged again using the simple average.

4. Analysis and Interpretation

This section analyses the overall performance of the selected private banks based on the CAMEL framework. As discussed earlier, the CAMEL approach is a ratio-based model that helps evaluate the performance of the banks based on five parameters: Capital adequacy, Asset quality, Management, Earnings, and Liquidity. The approach used to define each acronym of the CAMEL model was first calculated by ranking each bank's actual ratios over seven years. Understanding capital adequacy is where we begin. Table 1 shows the selected ratios for the study on different parameters, that is, under each acronym of the CAMEL model.

Table 1: Capital Adequacy Ratio

Capital Adequacy			
Ratio	**Formula**	**Interpretation**	**Criteria**
Capital adequacy ratio (CAR)	(Tier 1 Capital + Tier 2 Capital) / Risk-weighted Assets	The capital Adequacy Ratio determines the capacity of a bank to absorb a reasonable amount of loss. The Basel III norms specified a minimum capital to risk-weighted assets of 8%.	Higher the ratio, the better
Debt-Equity Ratio	Outside liabilities /Net worth	Debt-equity ratios signify the proportion of debt capital and equity capital used to finance the operations. It is also a measure of risk as it indicates the availability of shareholder equity to repay all the financial obligations in the event of liquidation. A lower ratio implies greater protection for the depositors.	Lower the ratio, the better
Advance to assets ratio	Total advances/ Total assets	A higher Advance to assets ratio indicates that a bank has an aggressive lending policy, which results in greater profitability.	Higher the ratio, the

			better
Government securities to total investment ratio	Government securities / Total investment	Government securities are considered as one of the safest debt instruments, as a result of which it gives a low return. The government security to total investment ratio indicates the proportion of government securities in the total investments of the banks and their ability to take the risk. A higher ratio signifies that the bank follows a low-risk-low-profit strategy.	Higher the ratio, the better

Based on the four ratios mentioned above, Table 2 below shows the group ranking of all the chosen private banks for the first criterion, Capital Adequacy. According to the table, HDFC Bank and Yes Bank is in the top place, followed by IndusInd Bank and Kotak Bank, while Axis Bank is last.

Table 2: Group Ranking for Capital Adequacy

	Ranks assigned to each sub-parameter					
Banks	**CRAR**	**D/E**	**Advances/Assets**	**Govt Securities/Investment**	**Average of ranks**	**Rank**
Axis Bank	5	6	5	4	5	6
HDFC Bank	3	4	1	2	2.5	1
IndusInd Bank	5	2	4	1	3	3
ICICI Bank	2	3	6	6	4.25	5
Kotak Bank	1	5	4	5	3.75	4
Yes Bank	4	1	2	3	2.5	1

Source**:** self-compiled from Annual Reports of respective banks

The second metric, Asset Quality, is shown in Tables 3 and 4 below based on its four ratios. According to the table, HDFC Bank secures the first place, IndusInd Banks holds second place followed by Kotak Bank, and the bottom position is held by ICICI Bank.

Table 3: Ratios calculated for Assets Quality

Asset Quality			
Ratio	**Formula**	**Interpretation**	**Criteria**
Net NPAs to Net advances ratio	Net NPAs / Net advances	Non-performing assets are those that ceases to generate income for the bank. It is a loan or advance given by the bank on which either the interest, principal amount, or both are due for more than 180 days. Net NPAs to Net advances ratio is an indicator of the credit efficiency of the bank. A higher ratio is a sign of increased credit risk or the likelihood of a large number of credit defaults	Lower the ratio, the better
Net NPAs to total assets ratio	Net NPAs / Total assets	Net NPAs to total assets ratio indicates the bank's efficiency in evaluating and monitoring their credit risk and ability to recover the loans or advances in time. It is a barometer of better utilization of assets and the performance of the bank	Lower the ratio, the better
Total Investment to total assets ratio	Total Investment/ total assets	The total Investment to total assets ratio specifies the extent or the proportion of the investments in the total assets against the advances. It is an estimate of how many assets are locked up as investments. A higher ratio adversely affects the profitability of the bank	Lower the ratio, the better
Percentage change in Net NPA	(Current year NPA- Previous year NPA)/Previous Year NPA	Percentage change in Net NPA measures the degree of change in the value of NPA over a period of time	Lower the change, the better

Table 4: Group ranking for Asset quality

	Ranks assigned to each sub-parameter					
Banks	**Net NPA/ Net Advances**	**Net NPA/ Total Assets**	**Total Investment/Total Assets**	**% Change in Net NPA**	**Average of ranks**	**Group Rank**
Axis Bank	5	5	1	5	4	4
HDFC Bank	1	1	4	3	2.25	1
IndusInd Bank	2	2	2	4	2.5	2
ICICI Bank	6	6	6	2	5	6
Kotak Bank	3	3	5	1	3	3
Yes Bank	4	4	3	6	4.25	5

Source**:** As of Table 2.

Efficiency, based on its four ratios. According to the scores in table 6, the HDFC bank secures the first position, and the second position is bagged by IndusInd Bank followed by a tie between Kotak Bank and Yes Bank4, whereas Axis holds the last position.

Table 5: Ratios calculated for Management Efficiency

Management			
Ratio	**Formula**	**Interpretation**	**Criteria**
Business per Employee	Revenue/Number of Employees	Business per Employee reveals the capability or the productivity of the employees of the bank to generate the business or the revenue	Higher the ratio, the better
Profit Per Employee	(Revenue – Operating Expenses)/ Employees	Profit Per Employee indicates the ability or competency of the employees to generate profit for the bank.	Higher the ratio, the better
Return on Net Worth	Net Income/Shareholder's Equity	Return on net worth is a measure of the profitability of the bank. It shows the bank's proficiency in generating income with shareholder capital. It is also an indicator of how well the banks management is utilizing the shareholder capital	Higher the ratio, the better
Total Advances to Total Deposits Ratio	Total Advances/Total Deposits	The total Advances to Total Deposits Ratio indicates the capability of the bank to convert their deposits into advances which in turn increases their earning capacity.	Higher the ratio, the better

Table 6: Group ranking for Management Efficiency

	Ranks assigned to each sub-parameter					
Banks	**Business/Employee**	**Profit/Employee**	**ROE**	**Advances/Total Deposits**	**Average of ranks**	**Group Rank**
Axis Bank	3	5	5	5	4.5	6
HDFC Bank	2	1	1	6	2.5	1
IndusInd Bank	5	2	2	4	3.25	2
ICICI Bank	4	4	4	3	3.75	5
Kotak Bank	6	3	3	2	3.5	3
Yes Bank	1	6	6	1	3.5	3

***Source*:** As of Table 2.

The fourth parameter, Earnings Quality, is explained in Tables 7 and 8 below, followed by a group ranking of all the chosen private banks for the fourth parameter. The table shows that HDFC Bank is in first place, IndusInd Bank is in second place followed by Kotak Bank and Axis Bank and ICICI Bank holds the last position.

Table 7: Ratios calculated for Earnings Quality

Earnings			
Ratio	**Formula**	**Interpretation**	**Criteria**
Return on assets	Net profits after tax/ Total Assets	Return on assets refers to the bank's ability or efficiency to generate income using its assets. A higher ROA indicates that the bank can use its assets efficiently. A Negative ROA means that the bank's assets yield a negative return	Higher the ratio, the better
Net interest margin to total assets ratio	(Interest income from borrowers– Interest paid to the depositors) / Total Assets	Net Interest margin is the excess of interest earned over interest expended relative to the total assets. A higher ratio indicates financial stability.	Higher the ratio, the better.
Operating profits to total assets ratio	Operating profits / total assets	The operating profits to total assets ratio show the bank's operating income generated per rupee invested in the assets. It determines the operating efficiency of the bank	Higher the ratio, the better.
Cost to income ratio	Operating expenses/Operating Income	The cost-to-income ratio shows the bank's cost in relation to its income. It determines the profitability of the bank and how well a bank operates. A higher cost to income ratio indicates high expenses or costs incurred as compared to the income earned.	Lower the ratio, the better

Table 8: Group ranking for Earnings

Ranks assigned to each sub-parameter						
Banks	**ROA**	**Net Interest Margin /Total Assets**	**Operating profits/Total Assets**	**Cost/Income**	**Average of ranks**	**Group Rank**
Axis Bank	4	4	3	4	3.75	4
HDFC Bank	2	1	1	1	1.25	1
IndusInd Bank	3	3	2	2	2.5	2
ICICI Bank	5	5	6	6	5.5	6
Kotak Bank	1	2	4	5	3	3
Yes Bank	6	6	5	3	5	5

***Source*:** As of Table 2.

The fifth parameter, Liquidity, is explained in Tables 9 and 10 below. According to the figures, Kotak Bank secures the first position, followed by the ICICI Bank and Axis Bank, whereas Yes Bank and HDFC Bank hold the last two positions.

Table 9: Ratios calculated for Liquidity

Liquidity			
Ratio	**Formula**	**Interpretation**	**Criteria**
Liquid Assets to Total Assets ratio	Liquid Assets / Total Assets	The liquid Assets to Total Assets ratio is a measure of the near-cash assets of the bank in proportion to the total assets. (NOTE: Liquid Assets = Cash in Hand, Balance with the RBI, Balance with Other Banks (Both in India and Abroad), and Money at Call and Short Notice.)	Higher the ratio, the better
Liquid Assets to Total Deposits Ratio	Liquid Assets / Total Deposits	The liquid Assets to Total Deposits ratio is a measure of the near-cash assets of the bank in proportion to the total deposits. It is an indicator of the ability of the bank to meet its financial obligations with the available liquid funds	Higher the ratio, the better
Government Securities to Total Assets Ratio	Government Securities / Total Assets	Government Securities to Total Assets Ratio indicates the value of government securities, i.e., less risky investments in proportion to total assets.	Higher the ratio, the better
Liquid Assets to Demand Deposits Ratio	Liquid Assets / Demand Deposits	The liquid Assets to Demand deposits ratio is a measure of the near-cash assets of the bank in proportion to the demand deposits. It is an indicator of the capability of the bank to meet its short-term financial obligations with the available liquid funds or meet the demand from depositors during a particular year.	Higher the ratio, the better

Table 10: Group ranking for Liquidity

	Ranks assigned to each sub-parameter					
Banks	**Liquid Assets/ Total Assets**	**Liquid Assets/ Total Deposits**	**Government Securities /Total Assets**	**Liquid Assets/Demand Deposits**	**Average of ranks**	**Group Rank**
Axis Bank	2	3	6	4	3.75	3
HDFC Bank	5	6	1	6	4.5	6
IndusInd Bank	4	5	2	5	4	4
ICICI Bank	3	2	5	1	2.75	2
Kotak Bank	1	1	3	2	1.75	1
Yes Bank	6	4	4	3	4.25	5

***Source*:** As of Table 2.

Table 11 lists the top six private banks in order of total performance using the CAMEL Model. To determine the composite ranks, the group averages and ranks were combined. The estimates put HDFC Bank at the top, followed by IndusInd Bank in second place, Kotak Mahindra Bank in third place, and Yes Bank in fourth place (4th position). Axis Bank and ICICI Bank are the two banks with securing last two positions (5th and 6th rank respectively)

Table 11: Composite Ranking for the overall performance of the selected Private Banks

Banks	Group Rank (Capital Adequacy)	Group Rank (Asset Quality)	Group Rank (Management)	Group Rank (Earnings)	Group Rank (Liquidity)	Average of Group ranks	Overall/ Composite Ranks
Axis Bank	6	4	6	4	3	4.6	5
HDFC Bank	1	1	1	1	6	2	1
IndusInd Bank	3	2	2	2	4	2.6	2
ICICI Bank	5	6	5	6	2	4.8	6
Kotak Bank	4	3	3	3	1	2.8	3
Yes Bank	1	5	3	5	5	3.8	4

***Source*:** As of Table 2.

5. Conclusions

The CAMEL model is used in this study to analyse the financial health of the chosen private banks. The CAMEL technique is an effective instrument for assessing the relative financial health of the Bank. It is helpful to evaluate banks' financial health, effectiveness, and performance based on specific criteria, such as capital sufficiency, asset quality, management, earnings, and liquidity.

In this study, we calculated twenty ratios under the five parameters of the CAMEL model for the top 6 private banks selected as per the value of their total assets. The ratios were calculated for five years, starting from 2015 to 2018. The banks were given the ranks based on their performance in a particular sub-parameter and group ranks for significant parameters. Finally, composite ranks have been estimated based on the overall performance of the banks. The method of assigning ranks is considered simple and user-friendly as it enables a common person to analyse complex financial data to make safe and sound decisions. The results obtained are as follows.

Regarding capital adequacy, the top-performing banks are HDFC Bank, Yes Bank, and IndusInd Bank whereas Kotak Mahindra, ICICI Bank and Axis Bank are the least performing banks. Also, it has been observed that all the banks have maintained a capital adequacy ratio of above 9% (minimum requirement as per Basel III) throughout the five years, which is a good sign of the availability of enough capital and protection to the depositors.

Regarding Asset Quality, the top-performing banks are HDFC Bank, IndusInd Bank, and Kotak Mahindra Bank whereas Axis Bank, Yes Bank and ICICI Bank are the least performing banks.

In terms of Management, the top-performing banks are HDFC Bank, IndusInd Bank, Yes Bank and Kotak Mahindra Bank whereas ICICI Bank and Axis Bank are the least performing banks. The Return on net worth is negative for ICICI Bank which may point to the incompetency and inefficiency of these banks in generating income.

In terms of Earnings the top-performing banks are HDFC Bank, IndusInd Bank, Kotak Mahindra Bank whereas Axis Bank, Yes Bank and ICICI Bank are the least performing banks Yes Bank has a negative ROA which is a sign that the banks may not be using their assets effectively to generate income and need to adopt an efficient course of action to improve the ratio.

In terms of Liquidity, the top-performing banks are Kotak Mahindra Bank, ICICI Bank, and Axis Bank. The least performing banks are IndusInd Bank, Yes Bank, and HDFC Bank.

Based on the overall ranking of the top 6 private banks based on the CAMEL, the highest rank is secured by HDFC Bank, followed by IndusInd Bank and Kotak Mahindra Bank. The fourth position is bagged by Yes Bank, fifth by Axis Bank, and last or sixth by ICICI Bank.

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