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CAMEL RATING: A STUDY ON LEADING COMMERCIAL BANKS

Sri Ayan Chakraborty
Faculty, Accounting & Finance, Nopany Institute of Management Studies, Kolkata.

Abstract
Banks are the life blood of every society as it cadre the need of the individuals as well as the corporate. Banks play a vital role behind economic development in mobilizing capital and other resources. Banking sector is one of the fastest growing sectors and hence lots of funds are invested in Banks. Performance evaluation of the banking sector is an effective measure and indicator to check the soundness of economic activities of an economy. CAMELS Model plays a pivotal role to evaluate the performance of banks. It is considered as the best model because it measures the Banks' performance from parameters like Capital Adequacy, Assets, Management, Earnings and Liquidity. CAMEL rating helps banks to enhance required capital adequacy, strengthen asset quality, improve management, increase earnings and reduce sensitivity to various financial risks. The attempt here is to see how various ratios are used and interpreted to reveal a bank's performance and how this particular model encompasses a wide range of parameters making it a widely accepted.

Keywords: Capital Adequacy, Asset Quality, Management Capability, Earnings Ability, Liquidity, Performance Evaluation, Standard Deviation, ANOVA.

I. Objective of the Study

- To understand the financial performance of the banks
- To evaluate the Performance in terms financial position of the banks.
- To describe the CAMELS model of ranking, banking institutions, so as to analyse the comparatives of various banks.
- To analyse the banks performance through CAMEL model and give suggestion for improvement if necessary

II. Review of Literature

a) Reddy K. Sriharsha (2012) analysed relative performance of banks in India using CAMEL approach. It is found that public sector banks have appreciably improved indicating positive impact of the reforms in liberalizing interest rates, rationalizing directed credit and Investments and increasing competition.

b) Srinivas K., Saroja L.(2013) compared and analysed the Financial Performance of HDFC and ICICI Bank . For the purpose of analysis of comparative financial performance of the selected banks using CAMELS model with t-test. The result showed that there is no significance difference between the ICICI and HDFC bank's financial performance but the ICICI bank performance is slightly less compared with HDFC.

c) Anita Makkar (2013) analyzed comparative analysis of the financial performance of Indian commercial banks. The study considered a sample of 37 banks (22 public sector banks and 15 private sector banks) for the period from 2006-07 to 2010-11. CAMELS rating methodology was used in the study to measure the performance of the considered banks. The study found that the IDBI Bank was the best performing bank followed by Kotak Mahindra Bank and ICICI Bank. Dhanalaxmi Bank had the worst performance followed by J & K Bank and Karnataka Bank Ltd. The results of 't' - test disclosed that there is a significant difference in the Capital Adequacy, Asset Quality and Earning Capacity of public and private sector banks in India, while there is no significant difference in the Management, Liquidity Position and Sensitivity to market risk of the two different banks groups.

d) Uppal and Amit Juneja (2012) analyzed comparison of different bank groups on their deposits, borrowings, loans and advances and investments related to different time periods. For the above analysis, all the banks are divided into four groups i.e. public sector banks, old private sector banks, new private sector banks and foreign banks. After the performance analysis, it is concluded that foreign banks are performing much better than the other bank groups, whereas the performance of old private sector banks is disappointing among all the bank groups. New private sector banks and Public sector banks are performing only satisfactorily.

e) Vikas Choudhary and SumanTandon (2010) analyzed the financial performance of public sector banks in India. Public sector banks form major part of total banking system in India so there is a need to evaluate the performance of these banks. The study is based upon secondary data covering the period from 1997-2007. For analyzing the performance CAGR and COV of advances, deposits, total assets, return on assets, and return on equity and spread ratio are calculated. Decline in growth of non-performing assets ratio is also considered for this evaluation. It is concluded the CAGR of various variables have shown variations from bank to bank.

III. Scope of Study

The study shows the role of CAMEL evaluation process on Profitability, Liquidity position and the NPA of leading commercial banks in India. This is the process of comparing income to output and determining how much profit was earned during a specific time period. A properly conducted profitability analysis provides invaluable evidence concerning the earnings potential of a company and the effectiveness of management and improves the liquidity position of a Bank.

Period of Study
The study covers a period of 5 years from 2012 to 2016 is taken for the study.

Methodology
Sources of Data
The study is based on secondary data. Information required for the study has been collected from the Annual Reports of State Bank of India, ICICI, HDFC and Axis Bank and different books, journal, magazines, and various banks websites.

Tools Applied
In this study various tools: Financial Tools – Ratio Analysis and Statistical Tools (i.e.) Mean and ANOVA test have been used for data analysis.
Mean = Sum of variable/N
Standard Deviation (SD) = $\sqrt{\sum X2/N-(\sum X/N)}$
Coefficient of Variation (COV) = SD/MEAN* 100

Hypothesis
An ANOVA is statistical hypothesis in which the sampling distribution of test statistic when null hypotheses is true. Null hypotheses have been set and adopted for the analysis of data. The null hypotheses are represented by H_0. It is a negative statement which avoids personal bias of investigator during data collection as well as the time of drawing conclusion.

IV. Limitation of the Study
1. The study is related to a period of 5 years.
2. Data has been collected from the published annual reports.
3. Capital Adequacy, Debt Equity, Advances to Total Assets, Investment, Business, Net Profit per Employee, Interest Income, Liquid Asset ratios have been taken for the study.

India's Leading Commercial Banks
State Bank of India
State Bank of India (SBI) is the largest banking and financial services company in India. Apart from banking, SBI also provides services in fields like Life Insurance, General Insurance and Capital Markets through its subsidiaries. As of 2016-17, it had assets of 30.72 trillion (US$460 billion) and more than 14,000 branches, including 191 foreign offices spread across 36 countries.

ICICI Bank
ICICI Bank, originally promoted in 1994 by ICICI Limited, an Indian financial institution is the largest bank private in India in terms of assets and third in term of market capitalisation. Headquartered in Mumbai, ICICI Bank has about 3540 branches, 11200 ATM's and over 82000 employees. The bank manages assets worth $99 billion.

HDFC Bank Limited
HDFC Bank Limited is an Indian banking and financial services company headquartered in Mumbai, Maharashtra. It has 90,421 employees and has a presence in Bahrain, Hong Kong and Dubai. The Bank's segments include Treasury, Retail banking, Wholesale banking and Other banking business. HDFC Bank is India's second-largest private sector lender by assets. As on December 31, 2016, the Bank's distribution network was at 4,555 branches and 12,087 ATMs across 2,597 cities.

Axis Bank Ltd
Axis Bank Ltd is the third largest of the private-sector banks in India offering a comprehensive suite of financial products. The bank has its head office in Mumbai and Registered office in Ahmedabad. The Bank offers the entire spectrum of financial services to customer segments covering Large and Mid-Corporates, MSME, Agriculture and Retail Businesses. It has 3300 branches, 13,003 ATMs, and nine international offices. The bank employs over 50,000 people and had a market capitalization of 1.0583 trillion (US$16 billion) (as on March 31, 2016).

CAMELS Ratings
CAMEL, a supervisory rating system was originally developed in the U.S. to evaluate a bank's overall position on the basis Profitability, Liquidity position and NPA's. It is implemented by every bank and credit union in the U.S. and also outside the U.S. by various banking supervisory regulators.

CAMEL ratings are assigned based on Financial Statements ratios, combined with on-site examinations made by a designated supervisory regulator. The Ratings are not released to the public but only to the top management and RBI to prevent a possible bank run on an institution which receives a CAMELS rating downgrade.

Institutions with deteriorating situations and declining CAMELS ratings are subject to ever increasing supervisory scrutiny. Failed institutions are eventually resolved via a formal resolution process designed to protect retail depositors.

The Components and Factors of CAMEL Ratings are:
C: Capital Adequacy
A: Assets
M: Management Capability
E: Earnings
L: Liquidity

Capital Adequacy

- Nature and volume of NPA in relation to total capital and other reserves
- Balance sheet figures including off balance sheet items, market & concentration risk
- Asset and capital growth experience and prospects
- Earnings performance and distribution of dividends
- Capital requirements and compliance with regulatory requirements
- Access to capital markets and sources of capital

Asset Quality

1. Volume of problem Non Performing Assets, overdue or rescheduled loans
2. Ability of management to administer all the Banks Assets and collection of loans
3. Large concentrations of loans and insiders loans, diversification of investments
4. Loan portfolio management, written policies, procedures internal control, MIS

Management Quality

a) Monitoring of activities by the management and their ability to understand and respond to the risks in the present environment and to plan for the future
b) Implementation of policies, procedures, contingency plan in compliance with laws
c) Concentration or delegation of authority
d) Overall performance of the bank and its risk profile

Earnings Ability

- Sufficient earnings to cover potential losses provide and pay dividend
- Composition of net income; Volume and stability of the components
- Level of expenses in relation to operations
- Adequacy of budgeting, forecasting
- Earnings exposure to market risks, such as interest rate variations, foreign exchange fluctuations and price risk

Liquidity

1. Sources and volume of liquid funds available to meet short term obligations
2. Volatility of deposits and loan demand
3. Interest rates and maturities of assets and liabilities
4. Access to money market and other sources of funds
5. Diversification of funding sources
6. Reliance on inter-bank market for short term funding
7. Management ability to plan, control and measure liquidity process.

Data Analysis: CAMEL Ratios

C	**Capital adequacy**	• Capital to Risk Asset Ratio (%) • Debt-Equity Ratio (times) • Advance to Total Assets (%) • Investment in Government securities to Total Investment (%)

A	**Asset quality**	• Net NPA to Net Advance (%) • Total Investment to Total Asset (%) • Net NPA to Total Asset (%)
M	**Management capability**	• Total Advances to Total Deposits (%) • Business Per Employee (Rs in Crore) • Net Profit Per Employee (Rs in Crore)
E	**Earnings ability**	• Net Profit to Total Assets • Interest Income to Total Income • Net Interest Income to Total Assets Ratio (%)
L	**Liquidity**	• Liquid Asset to Total Asset • Liquid Asset to Total Deposit (%) • Liquid Asset to Demand Deposit (%) • Government Securities to Total Assets

1. Capital Adequacy

Capital adequacy determines whether the bank has enough capital to absorb unexpected losses. The financial institutions must maintain adequate ratio to cope with shocks to their balance sheets and going bankrupt. In other words Capital Adequacy is a reflection of the inner strength of a bank, which would stand it in good stead during the times of crises. The following ratios measure Capital Adequacy.

Capital to Risk Asset Ratio: It is developed to ensure that banks can absorb a reasonable level of losses occurred due to operational losses and determine the capacity of the bank in meeting the losses. The higher the ratio, the more will be the protection of investors. The banks are required to maintain the CAR as specified by RBI. As per RBI guidelines, 31st March 2017, Banks should have a CRAR of minimum 10.25%

Exhibit – 1 Capital to Risk Asset Ratio (CRAR) (%)

	SBI	ICICI	HDFC	AXIS
2012	13.9	19.6	16.5	13.7
2013	12.9	18.7	16.77	17
2014	13	17.7	16.1	16.1
2015	12.8	17	16.8	15.1
2016	13.9	16.6	15.5	15.3
Mean	13.3	17.9	16.3	15.4
RANK	4	1	2	3
SD	0.6	1.23	0.5	1.228
COV	0.042	0.069	0.033	0.08

Exhibit-1 depicts that ICICI is ranked first with the highest CRAR of 17.9% followed by HDFC with 16.3% and AXIS Bank with 15.4%. State Bank of India scored the lowest position with lowest CRAR of 13.3%.

Debt-Equity Ratio: This ratio indicates the degree of leverage of a bank. It indicates how much of the bank business is financed through debt and how much through equity. It is the proportion of total outside liability to net worth.

Exhibit – 2 Debt-Equity Ratio (times)

	SBI	ICICI	HDFC	AXIS
2012	14.80	7.2	9	11.2
2013	14.60	7	9.2	8.9
2014	14.00	6.9	9.4	8.66
2015	14.20	6.95	8.1	9
2016	13.85	7.1	8.3	8.6
Mean	14.3	7.03	8.8	9.3
RANK	4	1	2	3
SD	0.4	0.12	0.6	1.09
COV	0.028	0.017	0.065	0.12

Exhibit-2 depicts that ICICI is ranked first with the lowest Debt Equity ratio of 7.03 followed by HDFC with 8.8 and AXIS Bank with 9.3%. State Bank of India scored the lowest position with the highest Debt Equity ratio of 14.3.

Advance to Total Assets: This ratio indicates a bank's aggressiveness in lending which ultimately produces better profitability. Higher ratio is preferred to a lower one.

Exhibit – 3 Advance to Total Assets (%)

	SBI	ICICI	HDFC	AXIS
2012	63.59	47.17	58.30	59.48
2013	65.29	48.90	60.64	57.84
2014	65.86	51.80	62.63	60.15
2015	62.67	53.08	63.15	60.88
2016	62.95	53.74	66.73	64.78
Mean	64.1	50.9	62.3	60.6
RANK	1	4	2	3
SD	1.4	2.81	3.1	2.5801
COV	0.022	0.055	0.05	0.04

Exhibit-3 depicts that State Bank of India is ranked first with the highest Advance to Total Assets ratio of 64.1% followed by HDFC with 62.3% and AXIS Bank with 60.6%. ICICI scored the lowest position with a ratio of 50.9%.

Investment in Government securities to Total Investment: This ratio reflects the risk involved in a bank's investment. It is calculated by dividing the amount invested in government securities by total investment. As government securities are risk-free so, higher the proportion of government securities in total investment, lower will be the risk involved in banks investment.

Exhibit – 4 Investment in Government securities to Total Investment (%)

	SBI	ICICI	HDFC	AXIS
2012	78.11	41.42	78.74	62.87
2013	75.45	42.93	76.86	63.72
2014	75.38	42.88	79.76	61.10
2015	80.57	48.64	73.78	68.55
2016	75.48	50.23	77.04	69.78
Mean	77.0	45.2	77.2	65.2
RANK	2	4	1	3
SD	2.3	3.94	2.3	3.7613
COV	0.030	0.087	0.03	0.06

Exhibit-4 depicts that HDFC is ranked first with the highest Investment in Government securities to Total Investment ratio of 77.2% followed by State Bank of India with 77% and AXIS Bank with 65.2%. ICICI scored the lowest position with a ratio of 45.2%.

Composite Capital Adequacy

Exhibit – 5 Composite Capital Adequacy

Banks	Capital Adequacy		Debt Equity		Advance / Total Assets		Government securities / Total Investment		Group Rank	
	%	Rank	Times	Rank	%	Rank	%	Rank	Average	Rank
SBI	13.3	4	14.3	4	64.1	1	77	2	2.75	3
ICICI	17.9	1	7.03	1	50.9	4	45.2	4	2.5	2
HDFC	16.3	2	8.8	2	62.3	2	77.2	1	1.75	1
AXIS	15.4	3	9.3	3	60.6	3	65.2	3	3	4

Exhibit-5 depicts the Composite Capital Adequacy calculated on the basis of group averages of the above four ratios of Capital Adequacy. HDFC Bank is at the top position with group average of 1.75 followed by ICICI of 2.5 and State Bank of India of 2.75 respectively. AXIS Bank scored the lowest position.

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Composite Capital Adequacy: Hypothesis
H_0: $\mu_1=\mu_2=\mu_3=\mu_4$ (There is no significant relationship between the Composite Capital Adequacy ratios of the above Banks)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4$ (There is significant relationship between the Composite Capital Adequacy ratios of the above Banks)

Exhibit – 6 Composite Capital Adequacy: ANOVA

ANOVA: Single Factor

Groups	Count	Sum	Average	Variance
Capital Adequacy	4	62.99	15.75	3.72
Debt Equity	4	39.39	9.85	9.70
Advance / Total Assets	4	237.93	59.48	34.42
Government securities / Total Investment	4	264.66	66.17	226.54

ANOVA: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	10168.99	3	3389.664	49.415	5.0E-07	3.49
Within Groups	823.15	12	68.596			
Total	**10992.14**	**15**				

Above analysis shows that the F value (49.415) is more than F Critical value of 3.49, therefore null hypothesis is rejected. Therefore it is concluded that there is significant relationship between the Composite Capital Adequacy ratios of the above Banks.

2. Asset Quality

Asset quality determines the healthiness of Banks against Bad Debt loss. The weakening value of assets, being prime source of banking problems, directly pour into other areas, as losses are eventually written-off against capital, which ultimately exposes the earning capacity of the institution. The asset quality is gauged in relation to the level and severity of non-performing assets, adequacy of provisions, recoveries, distribution of assets etc. Assets which generate periodical income are called performing assets and vice-versa. NPAs are classified as sub-standard, doubtful & loss assets based on the criteria stipulated by RBI.

Net NPA to Net Advance: It is the most standard measure to judge the assets quality, measuring the net nonperforming assets as a percentage of net advances. Net NPAs = Gross NPAs – Provisions. Low score indicates better performance.

Exhibit – 7 Net NPA to Net Advance (%)

	SBI	ICICI	HDFC	AXIS
2012	1.82	0.82	0.18	0.17
2013	2.10	0.81	0.20	0.21
2014	2.57	1.05	0.28	0.27
2015	2.12	1.77	0.26	0.28
2016	3.81	3.23	0.27	0.47
Mean	2.5	1.5	0.2	0.3
RANK	4	3	1	2
SD	0.8	1.03	0.04	0.115
COV	0.318	0.668	0.19	0.41

Exhibit-7 depicts that HDFC is ranked first with the lowest Net NPA to Net Advance ratio of 0.2% followed by AXIS and ICICI Bank with 0.3% and with 1.5%. State Bank of India scored the lowest position with the highest ratio of 2.5%.

Total Investment to Total Asset: It indicates the extent of deployment of assets in investment as against advances. This ratio is used as a tool to measure the percentage of total assets locked up in investments which, do not form part of the core income of a bank. A higher ratio indicates the conservative policy of a bank to provide safeguard to the investments against NPAs.

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Exhibit – 8 Total Investment to Total Asset (%)

	SBI	ICICI	HDFC	AXIS
2012	25.19	38.73	28.38	32.56
2013	24.35	37.89	27.21	33.29
2014	24.16	35.79	23.74	29.27
2015	25.77	36.65	24.62	25.37
2016	23.75	3.11	22.14	22.91
Mean	24.6	30.4	25.2	28.7
RANK	1	4	2	3
SD	0.8	15.31	2.5	4.4981
COV	0.03	0.50	0.10	0.16

Exhibit-8 depicts that State Bank of India is ranked first with the lowest Total Investment to Total Asset ratio of 24.6% followed by HDFC and AXIS Bank with 25.2% and 28.7% respectively. ICICI Bank scored the lowest position with the highest ratio of 30.4%.

Net NPA to Total Assets: This ratio reflects the efficiency of bank in assessing the credit risk and recovering the debts. In this ratio, the Net NPAs are measured as a percentage of Total Assets. The lower the ratio reflects the better is the quality of advances.

Exhibit – 9 Net NPA to Total Assets (%)

	SBI	ICICI	HDFC	AXIS
2012	1.18	0.31	0.10	0.41
2013	1.40	0.33	0.12	0.52
2014	1.73	0.44	0.17	0.57
2015	1.35	0.77	0.16	0.90
2016	2.47	1.45	0.18	0.74
Mean	1.6	0.7	0.1	0.6
RANK	4	3	1	2
SD	0.5	0.48	0.03	0.1921
COV	0.314	0.726	0.23	0.31

Exhibit-9 depicts that HDFC Bank is ranked first with the lowest Net NPA to Total Asset ratio of 0.1% followed by and AXIS and ICICI Bank with 0.6% and 0.7% respectively. State Bank of India scored the lowest position with the highest ratio of 1.6%.

Composite Asset Quality

Exhibit – 10 Composite Asset Quality

Banks	Net NPA to Net Advance		Total investment to Total Asset		Net NPA to Total Asset		Group Rank	
	%	Rank	%	Rank	%	Rank	Average	Rank
SBI	2.49	4	24.64	1	1.63	4	3	3
ICICI	1.54	3	30.43	4	0.66	3	3.333	4
HDFC	0.24	1	25.22	2	0.15	1	1.333	1
AXIS	0.28	2	28.68	3	0.63	2	2.333	2

Exhibit-10 depicts the Composite Asset Quality calculated on the basis of group average of the above ratios. HDFC Bank is at the top position with group average of 1.33 followed by AXIS Bank of 2.33 and State Bank of India of 3 respectively. ICICI scored the lowest position.

Composite Asset Quality: Hypothesis

H_0: $\mu_1=\mu_2=\mu_3=\mu_4$ (There is no significant relationship between the Composite Asset Quality ratios of the above Banks)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4$ (There is significant relationship between the Composite Asset Quality ratios of the above Banks)

Exhibit – 11 Composite Asset Quality: ANOVA
ANOVA: Single Factor

Groups	Count	Sum	Average	Variance
Net NPA to Net Advance	4	4.539	1.135	1.173
Total investment to Total Asset	4	108.974	27.244	7.703
Net NPA to Total Asset	4	3.062	0.765	0.385

ANOVA: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1843.85	2	921.93	298.65	5.9E-09	4.26
Within Groups	27.78	9	3.09			
Total	1871.64	11				

Above analysis shows that the F value (298.65) is more than F Critical value of 4.26, therefore null hypothesis is rejected. Therefore it is concluded that there is significant relationship between the Composite Asset Quality ratios of the above Banks.

3. Management Capability

Sound management is the most important factor behind a Bank's success. Management capability is basically the capability of the board of management, to identify, measure, and control the risks of an institution's activities and to ensure safe, sound, and efficient operation in compliance with applicable laws and regulations. It involves analysis of efficiency of management in generating business and in maximizing profits. Management capability is usually qualitative and can be understood through the subjective evaluation of Management systems, organizational culture and control mechanisms.

Total Advances to Total Deposits: This ratio measures the efficiency and ability of the bank's management in converting the deposits available into high earning advances. Total deposits include demand, term deposits and deposits of other banks, total advances include receivables.

Exhibit – 12 Total Advances to Total Deposits (%)

	SBI	ICICI	HDFC	AXIS
2012	82.26	103.61	80.65	77.17
2013	85.57	104.83	83.50	78.12
2014	85.83	107.74	85.93	82.83
2015	82.43	113.61	85.15	88.27
2016	82.98	109.46	89.27	96.19
Mean	83.8	107.8	84.9	84.5
RANK	4	1	2	3
SD	1.7	3.97	3.2	7.8763
COV	0.021	0.037	0.04	0.09

Exhibit-12 depicts that ICICI Bank is ranked first with the highest Advances to Deposits ratio of 107.8% followed by HDFC and AXIS Bank with 84.9% and 84.5% respectively. State Bank of India scored the lowest position with a ratio of 83.8%.

Business Per Employee: This ratio shows the productivity of human resources. It measures the efficiency of employees in generating business for the bank.

Exhibit – 13 Business Per Employee (Rs in Crore)

	SBI	ICICI	HDFC	AXIS
2012	11.96	9.85	6.74	12.29
2013	13.23	10.38	7.86	11.85
2014	15.39	10.34	10.01	12.10
2015	17.57	12.14	10.93	14.38
2016	19.86	12.75	11.79	14.03
Mean	15.6	11.1	9.5	12.9
RANK	1	3	4	2
SD	3.2	1.27	2.1	1.1798
COV	0.205	0.115	0.22	0.09

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Exhibit-13 depicts that State Bank of India is ranked first with the highest Business Per Employee ratio of 15.6 followed by AXIS and ICICI Bank with 12.9 and 11.1 respectively. HDFC Bank scored the lowest position with a ratio of 9.5.

Net Profit Per Employee: It is calculated by dividing PAT by employees. Higher ratio indicates efficiency of employees.

Exhibit – 14 Net Profit Per Employee (Rs in Crore)

	SBI	ICICI	HDFC	AXIS
2012	7.12	13.12	7.94	13.30
2013	7.85	15.47	9.95	13.81
2014	6.38	15.29	12.83	14.88
2015	7.97	18.05	14.01	17.64
2016	5.89	13.74	14.62	16.65
Mean	7.0	15.1	11.9	15.3
RANK	4	2	3	1
SD	0.9	1.91	2.8	1.8504
COV	0.129	0.126	0.24	0.12

Exhibit-14 depicts that AXIS Bank is ranked first with the highest Net Profit Per Employee of 15.3 followed by ICICI and HDFC Bank with 15.1 and 11.9 respectively. State Bank of India scored the lowest position with a ratio of 7.

Composite Management Efficiency Ratio

Exhibit – 15 Composite Management Efficiency Ratio

Banks	Total Advances to Total Deposits		Business Per Employee		Net Profit Per Employee		Group Rank	
	%	Rank	Times	Rank	Times	Rank	Average	Rank
SBI	83.81	4	15.60	1	7.04	4	3	2.5
ICICI	107.85	1	11.09	3	15.13	2	2	1.5
HDFC	84.90	2	9.47	4	11.87	3	3	2.5
AXIS	84.52	3	12.93	2	15.25	1	2	1.5

Exhibit-15 depicts the Composite Management Efficiency calculated on the basis of group average of the above ratios. Both ICICI and AXIS Bank are in the top with the group average of 2 followed by State Bank of India and HDFC Bank with the group average of 3.

Composite Management Efficiency Ratio: Hypothesis
H_0: $\mu_1=\mu_2=\mu_3=\mu_4$ (There is no significant relationship between Composite Management Efficiency ratios of the above Banks)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4$ (There is significant relationship between Composite Management Efficiency ratios of the above Banks)

Exhibit – 16 Composite Management Efficiency Ratio: ANOVA
ANOVA: Single Factor

Groups	Count	Sum	Average	Variance
Total Advances / Total Deposits	4	361.08	90.27	137.551
Business Per Employee	4	49.09068	12.27267	6.92787
Net Profit Per Employee	4	49.2982	12.32455	14.863

ANOVA: VARIATION

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	16212.11	2	8106.054	152.617	1.14E-07	4.26
Within Groups	478.0244	9	53.11382			
Total	16690.13	11				

Above analysis shows that the F value (152.617) is more than F Critical value of 4.26, therefore null hypothesis is rejected. Therefore it is concluded that there is significant relationship between Composite Management Efficiency ratios of the above Banks.

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4. Earnings Ability

The quality of earnings is an important criterion and determines the profitability of a bank and explains its sustainability and growth in future earnings. Inappropriate credit risk management adversely affects both quality and quantity of earnings. If a bank can achieve strong quality and quantity of earnings, then it will be able to pay a sustainable return to its shareholders. The capability to absorb any unexpected shock arising from different risks will also be increased for strong earnings and profitability of a bank.

Earnings and profitability are related with interest rate policies, provision to absorb losses, finance its expansion, pay dividends and increase Net Worth

Net Profit to Total Assets: This ratio is the interrelationship between Net profit and total assets. The ratio reflects the return on assets or efficiency in utilisation of assets. A higher ratio shows better earning and efficient utilisation of assets employed. The better utilization of assets will result in higher Net profits. Banks, which use their assets efficiently, will tend to have a better average than the industry average.

Exhibit – 17 Net Profit to Total Assets

	SBI	ICICI	HDFC	AXIS
2012	0.838	0.012	0.015	0.01
2013	0.84	0.014	0.017	0.015
2014	0.59	0.015	0.017	0.016
2015	0.63	0.0148	0.018	0.016
2016	0.41	0.011	0.018	0.016
Mean	0.7	0.013	0.017	0.016
RANK	1	4	2	3
SD	0.2	0.00	0.0	0.0006
COV	0.274	0.124	0.05	0.04

Exhibit-17 depicts that State Bank of India is ranked first with the highest Net Profit to Total Assets ratio of 0.7 followed by HDFC and AXIS Bank with 0.017 and 0.016 respectively. ICICI Bank scored the lowest position with a ratio of 0.013.

Interest Income to Total Income: Interest is major source of revenue for banking industry. Interest income includes interest or discount on advance and bills, incomes on investments, interest on balances with RBI and inter-bank funds etc. A bank also earns from other sources in addition to interest income viz. incomes from financial lease, commission, brokerage, exchanges, revaluations of assets and incomes by ways of dividend. A high ratio indicates capability of a bank to generate high incomes from interest.

Exhibit – 18 Interest Income to Total Income

	SBI	ICICI	HDFC	AXIS
2012	0.83	0.57	0.82	0.80
2013	0.84	0.60	0.83	0.799
2014	0.83	0.62	0.84	0.798
2015	0.81	0.61	0.84	0.802
2016	0.81	0.58	0.85	0.81
Mean	0.825	0.6	0.837	0.801
RANK	2	4	1	3
SD	0.013	0.02	0.0	0.0031
COV	0.016	0.034	0.01	0.00

Exhibit-18 depicts that HDFC Bank is ranked first with the highest Interest Income to Total Income of 0.837 followed by State Bank of India and AXIS Bank with 0.825 and 0.801 respectively. ICICI Bank scored the lowest position with a ratio of 0.6.

Net Interest Income to Total Assets Ratio: Net interest margin is the difference between interest earned and interest expended. The higher of this ratio indicates that the good earnings given by its assets.

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Exhibit – 19 Net Interest Income to Total Assets Ratio (%)

	SBI	ICICI	HDFC	AXIS
2012	3.16	2.10	0.14	4.89
2013	2.87	2.46	0.15	5.14
2014	2.82	2.64	0.16	4.84
2015	2.77	2.74	0.14	4.57
2016	2.65	2.75	0.18	4.58
Mean	2.9	2.5	0.2	4.8
RANK	2	3	4	1
SD	0.2	0.27	0.0	0.2409
COV	0.067	0.108	0.11	0.05

Exhibit-19 depicts that AXIS Bank is ranked first with the highest Net Interest Income to Total Assets Ratio of 4.8% followed by State Bank of India and ICICI Bank with 2.9 % and 2.5% respectively. HDFC Bank scored the lowest position with a ratio of 0.2%.

Composite Earning Quality

Exhibit – 20 Composite Earning Quality

Banks	Net Profit / Total Assets		Interest Income / Total Income		Net Interest Income / Total Assets		Group Rank	
	Times	Rank	Times	Rank	%	Rank	Average	Rank
SBI	0.662	1	0.82	2	2.85	2	1.67	1
ICICI	0.013	4	0.60	4	2.54	3	3.67	4
HDFC	0.017	2	0.84	1	0.15	4	2.33	2.5
AXIS	0.016	3	0.80	3	4.80	1	2.33	2.5

Exhibit-20 depicts the Composite Earning Quality calculated on the basis of group average of the above ratios. State Bank of India is in the top with the group average of 1.67 followed by HDFC and AXIS Bank with a group average of 2.33.
Both ICICI and are 2 followed by and Bank with the group average of 3. ICICI scored the lowest position with a group average of 3.67.

Composite Earning Quality: Hypothesis
H_0: $\mu_1=\mu_2=\mu_3=\mu_4$ (There is no significant relationship between Composite Earning Quality of the above Banks)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4$ (There is significant relationship between Composite Earning Quality of the above Banks)

Exhibit – 21 Composite Earning Quality: ANOVA

ANOVA: Single Factor

Groups	Count	Sum	Average	Variance
Net Profit / Total Assets	4	0.708	0.177	0.105
Interest Income / Total Income	4	3.061	0.765	0.013
Net Interest Income / Total Assets	4	10.350	2.588	3.638

ANOVA: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	12.64	2	6.32	5.05	0.03	4.26
Within Groups	11.27	9	1.25			
Total	23.90	11				

Above analysis shows that the F value is 5.05 which are more than F Critical value of 4.26 as a result of which null hypothesis is rejected. Therefore it is concluded that there is significant relationship between the Composite Earning Quality of the above banks.

5. Liquidity

Banks are in a business where liquidity is of prime importance. Among assets cash and investments are the most liquid of a bank's assets. An adequate liquidity position refers to a situation, where institution can obtain sufficient funds, either by increasing liabilities or by converting its assets quickly at a reasonable cost. Risk of liquidity is curse to the image of bank. Banks have to take a proper care to hedge the liquidity risk.

Liquid Asset to Total Asset: Liquid assets include cash in hand, money at call and short notice, balance with RBI and other banks (India and Abroad). Higher ratio indicates ability of bank to meet its financial obligations. This helps to improve the image of banks among creditors and customers.

Exhibit – 22 Liquid Asset to Total Asset

	SBI	ICICI	HDFC	AXIS
2012	0.07	6.65	6.21	4.88
2013	0.07	7.32	6.75	6.02
2014	0.07	6.46	7.93	7.40
2015	0.08	5.77	6.02	7.81
2016	0.07	7.08	5.35	6.33
Mean	0.1	6.7	6.45	6.49
RANK	4	1	3	2
SD	0.004	0.60	1.0	1.1617
COV	0.053	0.090	0.15	0.18

Exhibit-22 depicts that ICICI Bank is ranked first with the highest Liquid Asset to Total Asset ratio of 6.7 followed by AXIS and HDFC Bank with 6.49 and 6.45 respectively. State Bank of India scored the lowest position with a ratio of 0.1.

Liquid Asset to Total Deposit: This ratio measures the liquidity available to the depositors of a bank. It is calculated by dividing the liquid assets with total deposits. Here total deposits include both demand and Term deposits. A high ratio indicates good security on client's deposits.

Exhibit – 23 Liquid Asset to Total Deposit (%)

	SBI	ICICI	HDFC	AXIS
2012	9.02	14.60	19.81	6.33
2013	8.92	15.68	20.85	8.13
2014	9.09	13.42	19.72	10.19
2015	10.16	12.34	15.13	11.32
2016	9.06	14.42	12.38	9.41
Mean	9.3	14.1	17.6	9.0
RANK	3	2	1	4
SD	0.5	1.27	3.7	2.2120
COV	0.055	0.090	0.21	0.25

Exhibit-23 depicts that HDFC Bank is ranked first with the highest Liquid Asset to Total Deposit ratio of 17.6% followed by ICICI and State Bank of India of 14.1% and 9.3% respectively. AXIS Bank scored the lowest position with a ratio of 9%.

Liquid Asset to Demand Deposit: This ratio reflects the ability of a bank to meet the demand from depositors during a year. Banks provides higher liquidity to depositors by investing funds in highly liquid forms. This ratio is calculated by dividing the liquid assets with total demand deposits.

Exhibit – 24 Liquid Asset to Demand Deposit (%)

	SBI	ICICI	HDFC	AXIS
2012	124.56	68.27	85.51	70.78
2013	130.08	78.31	95.72	72.13
2014	127.05	74.37	108.15	79.57
2015	127.54	75.07	77.48	84.66
2016	117.76	80.24	77.01	79.71

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Mean	125.4	75.3	88.8	76.8
RANK	1	4	2	3
SD	4.7	4.57	13.2	6.5183
COV	0.037	0.061	0.15	0.08

Exhibit-24 depicts that State Bank of India is ranked first with the highest Liquid Asset to Demand Deposit ratio of 125.4% followed by HDFC and AXIS Bank of 88.8% and 76.8% respectively. ICICI Bank scored the lowest position with a ratio of 75.3%.

Government Securities to Total Asset: This ratio indicates the relationship between total funds invested in G-Sec to total assets. A higher ratio indicates low risk.

Exhibit – 25 Government Securities to Total Asset

	SBI	**ICICI**	**HDFC**	**AXIS**
2012	0.20	0.18	0.22	0.20
2013	0.18	0.17	0.21	0.21
2014	0.18	0.16	0.19	0.18
2015	0.19	0.16	0.20	0.17
2016	0.18	0.15	0.17	0.16
Mean	0.187	0.165	0.198	0.192
RANK	3	4	1	2
SD	0.007	0.01	0.002	0.0189
COV	0.039	0.059	0.10	0.10

Exhibit-25 depicts that HDFC Bank is ranked first with the highest Government Securities to Total Asset ratio of 0.198 followed by AXIS and State Bank of India with ratios of 0.192 and 0.187 respectively. ICICI Bank scored the lowest position with a ratio of 0.165.

Composite Liquidity

Exhibit – 26 Composite Liquidity

Banks	**Liquid Asset to Total Asset**		**Liquid Asset to Total Deposits**		**Liquid Asset to Demand Deposit**		**Govt Securities to Total Asset**		**Group Rank**	
	Times	**Rank**	**%**	**Rank**	**%**	**Rank**	**Times**	**Rank**	**Average**	**Rank**
SBI	0.07	4	9.25	3	125.40	1	0.187	3	2.75	3
ICICI	6.65	1	14.09	2	75.25	4	0.165	4	2.75	3
HDFC	6.45	3	17.58	1	88.77	2	0.198	1	1.75	1
AXIS	6.49	2	8.99	4	76.79	3	0.192	2	2.75	3

Exhibit-26 depicts the Composite Liquidity calculated on the basis of group average of the above ratios. HDFC in the top with the group average of 1.75 followed by State Bank of India, ICICI and AXIS Bank with a group average of 2.75.

Composite Liquidity: Hypothesis
H_0: $\mu_1=\mu_2=\mu_3=\mu_4$ (There is no significant relationship between Composite Liquidity ratios of the above Banks)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4$ (There is significant relationship between Composite Liquidity ratios of the above Banks)

Exhibit – 27 Composite Liquidity: ANOVA
ANOVA: Single Factor

Groups	**Count**	**Sum**	**Average**	**Variance**
Liquid Asset / Total Assets	4	19.66	4.92	10.44
Liquid Asset / Total Deposits	4	49.91	12.48	17.05
Liquid Assets / Demand Deposits	4	366.21	91.55	545.68
Govt Securities / Total Assets	4	0.74	0.19	0.0002

ANOVA: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	22337.61	3	7445.87	51.96	3.79E-07	3.49
Within Groups	1719.51	12	143.2924			
Total	24057.12	15				

Above analysis shows that the F value (51.96) is more than F Critical value of 3.49, therefore null hypothesis is rejected. Therefore it is concluded that there is significant relationship between the Composite Liquidity ratios of the above Banks.

Composite Ranking

In order to assess the overall performance of selected Commercial Banks, composite rating and results have been calculated and presented below.

Exhibit – 28 Composite Ranking

Banks	C	A	M	E	L	Average	Rank
SBI	2.75	3	3	1.67	2.75	2.63	3
ICICI	2.5	3.33	2	3.67	2.75	2.85	4
HDFC	1.75	1.33	3	2.33	1.75	2.03	1
AXIS	3	2.33	2	2.33	2.75	2.48	2

Exhibit-28 depicts the Composite Ranking based on the overall performance. HDFC Bank is in the top with the group average of 2.03 followed by AXIS Bank, State Bank of India and ICICI Bank with a group average of 2.48, 2.63 and 2.85 respectively.

ANOVA Results

One-way ANOVA test applied for determining whether there is any significant difference between the means of CAMEL ratios.

Hypothesis

H_0: $\mu_1=\mu_2=\mu_3=\mu_4$ (There is no significant relationship between Composite CAMEL ratios of the above Banks)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4$ (There is significant relationship between Composite CAMEL ratios of the above Banks)

Exhibit – 29 Composite Camel: ANOVA

ANOVA: Single Factor

Groups	Count	Sum	Average	Variance
C	4	10	2.5	0.29
A	4	10	2.5	0.78
M	4	10	2.5	0.33
E	4	10	2.5	0.70
L	4	10	2.5	0.25

ANOVA: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	8.88E-16	4	2.22E-16	4.71E-16	1	3.056
Within Groups	7.069444	15	0.471296			
Total	7.069444	19				

Above analysis shows that the F value (4.71) is more than F Critical value of 3.056, therefore null hypothesis is rejected. Therefore it is concluded that there is significant relationship between the CAMEL ratios of the above Banks.

Conclusion

The current study on four leading Commercial Banks has been conducted to examine economic sustainability and performance of the Banks by using CAMEL Model during the period 2012 to 2016 (five years). The study reveals that:

- **HDFC Bank** is at top position in terms of **Composite Capital Adequacy.**

- **HDFC Bank** is at top position in terms of **Composite Asset Quality**.
- In context of **Composite Management Efficiency**, **ICICI and AXIS** are at top
- In the terms of **Composite Earnings Quality**, **SBI** is at first position.
- **HDFC Bank** is at top position in terms of **Composite Liquidity position.**
- Composite Performance shows that **HDFC Bank** is ranked first among the leading four commercial sample banks followed by **AXIS Bank, SBI** and **ICICI.**
- The study depicted that though ranking of ratios are different, but there is no statistically significant difference between the CAMEL ratios.

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