An Analysis of Earnings Efficiency of Select Indian Public and Private Sector Banks

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Abstract - The performance of banks in a country must be evaluated carefully because it has a direct impact on the country's economy. The current study's primary goal is to investigate and evaluate the earnings efficiency of selected Indian public and private sector banks. The study spans ten years, from 2014 to 2023, in total. One of the CAMEL Model's key parameters is earnings efficiency. Banks for the study were selected based on market capitalization and net profit. The biggest private and public sector banks (HDFC, ICICI, and KOTAK Bank) are included in the research, along with SBI, BOB, and PNB, the top public sector banks. The analysis and assessment of financial performance of selected banks is done using an acronym "E" of CAMEL rating system as recommended by Padmanabhan Committee. The evaluation parameters of the CAMEL Model are as follows: C - Capital Adequacy Ratios, A - Asset Quality Ratios, M - Management Efficiency Ratios, E – Earnings Quality Ratios, and L – Liquidity Ratios. Study spans from 2014 to 2023.Results are analysed using descriptive statistics. Hypothesis testing used one-way ANOVA.

Keywords – CAMEL rating system, Earnings Efficiency, Ratio analysis, ROAA, ROI, Cost of Funds.

I. INTRODUCTION

The banking sector is crucial due to its function as a catalyst for economic growth, facilitator of financial transactions, manager of risks, conduit for monetary policies, and promoter of overall economic stability and development. To maintain integrity and stability in the financial system, regulatory bodies routinely evaluate the financial performance of banks. This oversight guarantees regulatory compliance, protects depositor funds, aids in the early identification of risks, and advances general economic stability. The CAMEL model has been adopted by regulatory authorities and financial institutions to monitor and compare the financial health and performance of banks, identify potential weaknesses, and take appropriate actions to maintain stability and mitigate risks in the banking system.

"Earnings Efficiency" is a critical metric in the CAMEL model, which banking regulators use to analyse the financial health of banks, since it measures how well a bank uses its resources to produce profits. This measure looks at how the bank's revenue and operational costs relate to one another. Investors and regulators can learn more about a bank's operational efficacy and profitability by looking at its earnings efficiency. It offers a comprehensive picture of how well the bank is using its resources to produce long-term, sustainable profits.

II. REVIEW OF LITERATURE

A variety of academics, researchers, and policymakers have evaluated the banking industry at various points in time. A few of the studies that address the need for the current study are included here.

Ramya (2017) examined the financial execution of the State Bank of India from 2012 to 2016 using the CAMEL approach. The necessary steps must be taken in order to strengthen SBI's position, according to a few critical metrics, such as debt-to-equity, operating profit, and non-interest income to total income.

Majumdar (2016) analysed 15 Bangladeshi banks' financial performance using CAMEL Model, finding significant differences and suggesting banks take necessary steps to recover their shortcomings.

Prasuna (2003) used CAMEL to evaluate Indian banks. Performance analysis was done on 65 banks in 2003–2004. Despite strong competition, clients received greater offers, innovative products, and higher-quality services.

Erol (2014) compared the performance of Turkish Islamic banks and conventional banks using the CAMEL model. According to the research, Islamic banks did better than conventional banks in terms of asset management ratios and profitability, but they also showed less sensitivity to the market risk criterion.

Sushendra Kumar Misra (2013) evaluated the State Bank Group's performance and financial soundness using the CAMEL approach and came to the conclusion that the bank has to strengthen its position pertaining to capital adequacy and asset quality.

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Anita Makkar (2013) looked at a comparative comparison of Indian commercial banks' financial results. The study concluded that, in general, the financial performance of India's public and private sector banks does not differ statistically significantly; however, public sector banks still need to improve overall if they are to maintain a strong competitive position.

Mukherjee et al. (2002) explored technical efficiency and benchmarked 68 commercial banks from 1996-1999 using DEA (Data Envelop Analysis). They found Indian PSBs more effective than multinational and private banks. The study improved PSB performance.

Ghosh Saibal (2009) suggested that Indian banks should adopt international standards and enhance their technical orientation to increase profit efficiency in the near future.

Misra (2013) assessed the State Bank Group's performance and financial soundness using the CAMEL approach; the research concluded that the bank has to strengthen its standing in terms of asset quality and capital adequacy..

III. RESEARCH METHODOLOGY

OBJECTIVES:

1. To assess sample banks' financial health using CAMEL Model Earnings Efficiency Parameter.
2. To evaluate and rank chosen banks by Earnings Efficiency Ratios.

HYPOTHESIS:

H0 1: There is no significant difference in Earnings Capacity Trends among the select Public and Private sector banks of India.

PERIOD OF THE STUDY: March 2014 to March 2023 is the study period.

TOOLS USED: CAMEL Model, Data analysis and hypothesis testing involve financial and statistical procedures including Ratio Analysis, Descriptive Statistics, and One-way ANOVA.

SAMPLE SIZE:

Study sample sizes include six banks. Sampled banks included HDFC, ICICI, and KOTAK from the private sector as well as SBI, BOB, and PNB from the public sector. We select samples by considering market capitalization and net profits. The sample is chosen based on market cap and net profit.

LIMITATIONS OF THE STUDY:

Since the study spans ten years, its results cannot be generalised. The Earnings Efficiency Parameter by itself is insufficient for evaluating the financial performance of banks.

DATA COLLECTION:

The study uses secondary data. The annual reports of SBI, BOB, BOB, PNB, HDFC, ICICI Bank and KOTAK Bank were analysed. Magazines, Websites, banking bulletins, Newspapers and other journals are referred.

The following ratios are looked at in order to assess banks' financial performance using Earnings Efficiency under the CAMEL Model.

1) Net Profit to Average Assets Ratio (ROAA)
2) Operating Profit to Total Assets Ratio
3) Interest Income to Total Assets Ratio
4) No-Interest Income to Total Assets Ratio
5) Return on Advances Ratio
6) Return on Investment Ratio
7) Cost of Deposits Ratio
8) Cost of Borrowings Ratio
9) Cost of Funds Ratio
10) Expenses to Income Ratio

IV. DATA ANALYSIS & DISCUSSION

TABLE NO. 1

Ratio	Ranking Criteria	Sector	Public Banks			Private Banks		
		Bank /Rank	SBI	BOB	PNB	HDFC	ICICI	KOTAK
(1) ROAA: Return on Average Assets		Average	0.45%	0.21%	-0.15%	1.88%	1.35%	1.83%
		Rank (Overall)	4	5	6	**1**	3	2
		Average (Sector-wise)	0.17%			1.69%		
		Rank (Sector-wise)	2			**1**		
(2) OP to TA: Operating Profit to Total Assets		Average	1.68%	1.61%	1.75%	3.09%	2.44%	2.78%
		Rank (Overall)	5	6	4	**1**	3	2
		Average (Sector-wise)	1.68			2.77		
		Rank (Sector-wise)	2			**1**		
(3) II to TA: Interest Income to Total Assets		Average	6.54%	6.13%	6.65%	7.53%	6.84%	7.88%
		Rank (Overall)	5	6	4	2	3	1

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		Average (Sector-wise)	6.44			7.42			
		Rank (Sector-wise)	2			**1**			
(4) NII to TA: Net Interest Income to Total Assets		Average	0.89%	0.83%	1.00%	1.45%	1.74%	1.52%	
		Rank (Overall)	5	6	4	3	1	2	
		Average (Sector-wise)	0.90			1.57			
		Rank (Sector-wise)	2			1			
(5) ROA: Return on Advances		Average	7.53%	10.64%	7.62%	9.14%	8.45%	9.53%	
		Rank (Overall)	6	**1**	5	3	4	2	
		Average (Sector-wise)	8.59			9.04			
		Rank (Sector-wise)	2			**1**			
(6) ROI: Return on Investment		Average	6.77 %	7.07 %	6.77 %	6.44 %	6.13 %	6.91 %	
		Rank (Overall)	4	**1**	3	5	6	2	
		Average (Sector-wise)	6.87 %			6.49 %			
		Rank (Sector-wise)	**1**			2			
(7) COD: Cost of Deposits		Average	5.46%	4.23%	4.738%	4.38%	4.32%	4.743%	
		Rank (Overall)	6	**1**	4	3	2	5	
		Average (Sector-wise)	4.81			4.48			
		Rank (Sector-wise)	2			**1**			
(8) COB: Cost of Borrowings		Average	2.03%	2.07%	1.29%	5.85%	5.98%	2.96%	
		Rank (Overall)	2	3	**1**	5	6	4	
		Average (Sector-wise)	1.80			4.93			
		Rank (Sector-wise)	**1**			2			
(9) COF: Cost of Funds		Average	4.42%	4.08%	4.49%	4.53%	4.57%	4.54%	
		Rank (Overall)	2	**1**	3	4	6	5	
		Average (Sector-wise)	4.33			4.55			
		Rank (Sector-wise)	**1**			2			
(10) C to I: Cost to Income		Average	51.95%	47.15%	47.43%	41.08%	38.92%	48.50%	
		Rank (Overall)	6	3	4	2	**1**	5	
		Average (Sector-wise)	48.84%			42.83%			
		Rank (Sector-wise)	2			**1**			

Source: Calculated and Compiled from Financial Statements of the Sample Banks

ANALYSIS & DISCUSSION:

The aforementioned Table No. 1 indicates that Net profit to average assets ratio (ROAA) (1.69%), operating profit to total assets ratio (2.77%), interest income to total assets ratio (7.42%), non-interest income to total assets ratio (1.57%), return on advances ratio (9.04%), cost of deposits ratio (4.48%), and cost of expense to income ratio (42.83%), private sector banks rank first. Public sector banks scored flawless 1.80% for borrowing, 4.33% for capital, and 6.87% for return on investment. Public banks performed well in three Earnings Efficiency Parameters, whereas private banks performed well in six.

RATIOS		**(1) ROAA**			**(2) OP to TA**			**(3) II to TA**			**(4) NII to TA**			**(5) ROADV**			**(6) ROI**			**(7) COD**			**(8) COB**			**(9) COF**			**(10) C to I**			**COMPOSITE**	**COMPOSITE**
RANK / SECTOR		**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**	**WG**	**BG**	**Overall**		
SBI	**BANKS PUBLIC**	1	4		2	5		2	5		2	5		3	6		3	4		3	6		2	2		2	2		3	6		2	**1**
BOB		2	5	2	3	6	2	3	6	2	3	6	2	1	1	2	1	1	**1**	1	1	2	3	3	**1**	1	1	**1**	1	3	2		
PNB		3	6		1	4		1	4		1	4		2	5		2	3		2	4		1	1		3	3		2	4			

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HDFC	**BANKS PRIVATE**	1	1		1	1		2	2		3	3		2	3		2	5		2	3		2	5		1	4		2	2		**1**	2		
ICICI		3	3	**1**	3	3	**1**	3	3	**1**	1	1	**1**	3	4	**1**	3	6	2	1	2	**1**	3	6	2	3	6	2	3	1	**1**				
KOTAK		2	2		2	2		1	1		2	2		1	2		1	2		3	5		1	4		2	5		1	5					

TABLE NO. 2

Source: Compiled from the Calculated Ratios Based on Financial Statements of the Sample Banks

(RANKING of Banks by Earnings Efficiency Parameter [E])

(1) **ROAA**: Return on Average Assets

(2) **OP to TA**: Operating Profit to Total Assets

(3) **II to TA**: Interest Income to Total Assets

(4) **NII to TA**: Net Interest Income to Total Assets

(5) ROA: Return on Advances

(6) ROI: Return on Investment

(7) COD: Cost of Deposits

(8) COB: Cost of Borrowings

(9) COF: Cost of Funds

(10) C to I: Cost to Income

(11) WG: Within the Group

(12) BG: Between the Groups

ANALYSIS & DISCUSSION:

The aforementioned table no. 2, it is found that the public bank SBI showed good performance in earning returns on assets employed by it. PNB scored 1st rank in terms of operating profit to total assets, interest income to total assets ratio, non-interest income to total assets ratio and cost of borrowings. BOB was leading in aspects of return on advances, return on investments, cost of deposits, cost of funds and cost to income ratios. Overall, from public banks, PNB, BOB and SBI banks ranked 1st, 2nd and 3rd ranks respectively. From private banks, HDFC bank was leading in terms of ROAA, operating profit to total assets and cost of funds. ICICI bank excelled in aspects of non-interest income to total assets and cost of deposits. KOTAK bank was showed good performance in the areas of interest income to total assets, return on advances, return on investments, cost of borrowings and cost to income ratios. Overall, pertaining to earnings efficiency parameter of CAMEL Model, the private sector banks showed robust performance from sl. No 1 to 6 (higher the ratio is better is the criteria for evaluation) and the public sector banks were leading in the ratios sl. no. 7 to 10 (lower the ratio; the better it is the criteria for evaluation.

ANALYSIS & DISCUSSION:

(1) RETURN ON AVERAGE ASSETS: ROAA helps management evaluate a bank's operational performance and asset utilisation. A high ratio indicates that the bank optimised its resources to maximise earnings. Among the chosen public sector banks, SBI Bank has a high ROAA of 0.45% with greater consistency than the others. With more consistency, HDFC ranked first (1.69%) in the private sector. The private sector banks are the best in utilising of their resources in order to generate high profits.

(2) OPERATING PROFIT TO TOTAL ASSETS: The efficiency of business activities and the profit made from the assets used were shown by the operating profit to total assets ratio. The aforementioned table indicates that, with a 3.09 percent efficiency rating, HDFC Bank ranked highest, followed by KOTAK Bank (2.78%), ICICI Bank (2.44%), PNB (1.75%), SBI Bank (1.68%), and BOB (1.61%). HDFC Bank held the top spot among public sector banks, while PNB was ranked first among private sector banks. The OPTAR of private sector banks is higher than that of public sector banks.

(3) INTEREST INCOME TO TOTAL ASSETS: The ratio of interest income to total assets demonstrates how reliant banks are on lending interest as a source of funding. While a high ratio is a good indication, a low ratio can suggest that banks rely on non-interest sources of funding. KOTAK bank received the highest rating of 7.88% among the selected banks, followed by

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HDFC and ICICI at 7.53% and 6.84%, respectively. Private sector banks rated #1 with 7.42%, more than public sector banks, suggesting that these banks rely on lending interest as funding.

(4) NON-INTEREST INCOME TO TOTAL ASSETS: Bank earnings from non-interest bearing activities are called non-interest income. Commission, fee, and trade are NII categories. The bank increases fee income by creating new products and adopting technology to maintain service levels. This ratio should be higher than 0.75 percent. From the private sector, ICICI Bank (1.74) ranked first, while PNB (1.00) ranked first among public sector banks. The selected bank's NII ratio exceeds 0.75%. Though both sectors meet the standard, the private sector's Non-Interest Income Ratio is 1.57% higher than the public sector's, indicating that private sector banks earn more from non-interest activities.

(5) RETURN ON ADVANCES: This ratio indicates how efficiently banks use their advances. It shows the return on advances for sample public and private sector banks. The above table shows that the BOB has a higher ratio of return on advances of 10.64% than the SBI, which has a lower ratio of 7.53%. With a greater return on advances (9.04%) than public sector banks, private sector banks were placed #1. Banks in the private sector are thus receiving higher interest rates on advances and loans.

(6) RETURN ON INVESTMENT: ROI is a useful indicator of bank investment efficiency. Higher ratios mean higher benefits. ROI of six banks studied over 10 years. The BOB has the highest ratio (7.07), moderate consistency (0.1452). The KOTAK placed 2nd (6.91%) and PNB 3rd (6.773%). Public sector banks earn 6.87 % on investments, compared to 6.49% for private sector banks. Comparatively, the public sector banks are performing well in earning returns on its investments with 6.87 % than the private sector banks (6.49%).

(7) COST OF DEPOSITS: The cost of deposits is the sum of money that a bank must pay on its deposits. The bank can make a sizable amount of interest spread if its cost of deposits ratio is low. With a 4.23% cost of deposit, BOB is the least expensive bank in the public sector and among all the chosen banks, ranking #1 with a 0.1335 consistency score. With 4.32%, ICICI Bank took the top spot among private sector banks. With a low cost of deposits of 4.48% compared to both sectors, the private sector bank has achieved the top ranking.

(8) COST OF BORROWINGS: The cost of borrowing ratio displays banks' borrowing costs. Banks often borrow to meet their financial needs. The high ratio will increase bank debt. Among public and private sector banks, PNB relies less on borrowed funds (1.29%) with considerable regularity, ranking first. SBI, BOB, KOTAK, HDFC, and ICICI secured 2nd, 3rd, 4th, 5th, and 6th places. Overall, the public sector banks are less depending on borrowed funds to meet their financial obligations.

(9) COST OF FUNDS: Business borrowing and depositing costs are shown in the cost-to-fund ratio. Total funds are deposits and borrowings. No substantial difference exists in the selected bank's cost of funds ratio. BOB (4.08%) and HDFC (4.53%) ranked first in public and private sectors, respectively. Though not significantly different, private banks ranked 1st. Low funding costs allow banks to generate greater interest spread, increasing profitability and wealth maximization.

(10) COST TO INCOME: It shows a bank's costs as a percentage of revenue. A lower ratio indicates a more profitable, productive, and competitive bank. ICICI's operating expense-to-net income ratio is 38.92% with higher consistency (0.0775) than all other banks, indicating efficient expense reduction. BOB has the lowest ratio of 47.15% among public sector banks. Private banks have a 42.83 % ratio, which is lower than public banks and shows more profitability, productivity, and competitiveness.

TESTING OF HYPOTHESIS - EARNINGS EFFICIENCY PARAMETERS (E)				
Criteria for Ranking – Higher the ratio the better it is.				
S. No	**SECTOR/RATIO (EARNINGS EFFICIENCY PARAMETERS - E)**	**PUBLIC SECTOR BANKS (SBI, BOB and PNB)**	**PRIVATE SECTOR BANKS (HDFC, ICICI and KOTAK)**	**ANALYSIS & DISCUSSION**
1	Net Profit to Average Assets (ROAA) Ratio	0.17%	1.69%	H0 4: There is no significant difference in Earnings Capacity Trends among the select Public and Private sector banks of India.
2	Operating Profit to Total Assets Ratio	1.68%	2.77%	**ACCEPT / REJECT NULL HYPOTHESIS:** P-value (0.7229) > Level of Significance (0.05) & F-value (0.1329) is < F-crit-value (4.9646)
3	Interest Income to Total Assets Ratio	6.44%	7.42%	
4	Non-Interest Income to Total Assets Ratio	0.90%	1.57%	
5	Return On Advances Ratio	8.59%	9.04%	**RESULT: ACCEPT THE H0.**
6	Return On Investments Ratio	6.87%	6.49%	

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7	Cost Of Deposits Ratio	4.81%	4.48%
8	Cost Of Borrowings Ratio	1.80%	4.93%
9	Cost Of Funds Ratio	4.33%	4.55%
10	Cost To Income Ratio	48.84%	42.83%

S. NO. 1 to 6

ANOVA: Single Factor **SUMMARY**

Groups	*Count*	*Sum*	*Average*	*Variance*
PUBLIC SECTOR BANKS (SBI, BOB and PNB)	6	0.24659898	0.04109983	0.001297031
PRIVATE SECTOR BANKS (HDFC, ICICI and KOTAK)	6	0.289767291	0.048294548	0.001038592

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.0001552	1	0.000155	**0.1329768**	**0.7229587**	**4.96460**
Within Groups	0.0116781	10	0.001167			
Total	**0.0118333**	**11**				

TABLE NO. 4

Analysis & Discussion:

Table No. 4 shows that the larger the ratio, the better the criterion for ratios from serial numbers 1 to 6. The obtained F-critical value (4.964602744) exceeds the F-value (0.132976825), and the derived Probable value (0.722958746) exceeds the significance level of 0.05. Accept the null hypothesis (H0). According to the values obtained, "There is no significant difference in Earnings Efficiency Trends among the select Public and Private sector banks of India".

TABLE NO. 5

TESTING OF HYPOTHESIS - EARNINGS EFFICIENCY PARAMETERS (E)

Criteria for Ranking – Lower the ratio the better it is.

S .No	SECTOR/RATIO (EARNINGS EFFICIENCY PARAMETERS - E)	PUBLIC SECTOR BANKS (SBI, BOB and PNB)	PRIVATE SECTOR BANKS (HDFC, ICICI and KOTAK)
7	Cost of Deposits Ratio	4.81%	4.48%
8	Cost of Borrowings Ratio	1.80%	4.93%
9	Cost of Funds Ratio	4.33%	4.55%
10	Cost to Income Ratio	48.84%	42.83%

ANALYSIS & DISCUSSION

H0 4: There is no significant difference in Earnings Capacity Trends among the select Public and Private sector banks of India.

ACCEPT / REJECT NULL HYPOTHESIS:
P-value (0.9613) > Level of Significance (0.05)
&
F-value (0.0025) is < F-crit-value (5.9873)
RESULT: ACCEPT THE H0.

ANOVA: Single Factor **SUMMARY** **S. NO. 7 to 10**

Groups	*Count*	*Sum*	*Average*	*Variance*
PUBLIC SECTOR BANKS (SBI, BOB and PNB)	4	0.597849639	0.14946241	0.051245112
PRIVATE SECTOR BANKS (HDFC, ICICI and KOTAK)	4	0.567950556	0.141987639	0.036446465

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.000111744	1	0.000111744	0.002548578	0.961375805	5.987377607
Within Groups	0.263074732	6	0.043845789			
Total	0.263186477	7				

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Analysis & Discussion:

The preceding table (Table No. 5) clearly shows that the smaller the ratio, the better the requirements for ratios from serial numbers

7 to 10. The calculated F-critical value (5.987377607) is bigger than the F-value (4.168012953), and the derived Probable value, 0.961375805, exceeds the 0.05 level of significance. Accept the Null Hypothesis (H0). According to the calculated values,

"There is no significant difference in Earnings Efficiency Trends among the select public and private sector banks of India".

V. CONCLUSION

Private sector banks have presented more efficiency than public sector banks in terms of ROAA, operational profit to total assets ratio, interest income to total assets ratio, non-interest income to total assets ratio, return on advances, cost of deposits, and cost of expense to income ratio. Public sector banks scored flawlessly in terms of return on investment, cost of cash for capital, and cost of borrowing. While private banks outperformed public banks in six Earnings Efficiency Parameters, public banks excelled in three of them. The bank's operating expenses have increased by roughly 26% in recent years. Creating a comprehensive operational risk management policy, conducting regular assessments, implementing effective internal controls, training employees, developing a comprehensive operational risk response plan, conducting regular operational risk reviews, and complying with regulations and standards can reduce operational risk for banks. Banks reduce losses, preserve client trust, and comply with legislation using operational risk management. Banks can preserve earnings ratios and enhance economic growth by diversifying assets, balancing risks and rewards, and monitoring regulations. Operational risk management helps banks reduce losses, maintain client trust, and comply with laws. Diversifying assets, balancing risks and benefits, and monitoring regulatory requirements can help banks maintain earnings ratios and boost economic growth.

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