Comparative Analysis of the Financial Performance of Private and Public Sector Banks in India

An Internship Report for

Course code and Course Title: MGF-651 & Internship and Summer Training

Credits: 16

Submitted in partial fulfilment of Master's Degree

(MBA) in Financial Services

By

Jonathan Austin Alphonso

07

702497266237

201809609

Under the Supervision of

Dr. Sanjeeta G. Parab

Goa Business School

MBA in Financial Services

GOA UNIVERSITY

Date: 29/04/2024

Seal of the School

DECLARATION BY STUDENT

I hereby declare that the data presented in this Internship report entitled, "Comparative Analysis of the Financial Performance of Private and Public Sector Banks in India" is based on the results of investigations carried out by me in the (MBA) in Financial Services at the Goa Business School, Goa University under the Supervision of DrSanjeeta Parab and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities / College will be not be responsible for the correctness of observations / experimental or other findings given the internship report/work.

I hereby authorize the University/college authorities to upload this dissertation on the dissertation repository or anywhere else as the UGC regulations demand and make it available to any one as needed.

Jonathan
29/04/24

Date: 29/04/2024

Jonathan Austin Alphonso

Place: Goa University

Seat no: 07

COMPLETION CERTIFICATE

This is to certify that the internship report "Comparative Analysis of the Financial Performance of Private and Public Sector Banks in India" is a bonafide work carried out by MrJonathan Austin Alphonso under my supervision in partial fulfilment of the requirements for the award of the degree of Masters in Business Administration in the Discipline Financial Services at the Goa Business School, Goa University.

29/04/2024.

Dr.Sanjeeta G. Parab

Date: 29/04/2024

Goa Business School
Goa University

Signature of Dean of the School/HoD of

Dept School/Dept Stamp

Date: 29/04/2024

Place: Goa University

KPT & ASSOCIATES LLP
CHARTERED ACCOUNTANTS

Office : 609, 6th Floor, Shiv Towers,
Patto , Panaji, Goa -403001
Email Id: casandeshprabhu@gmail.com
Mobile- 8552934322

INTERNSHIP CERTIFICATE

This is to certify that Mr. Jonathan Austin Alphonso, Student of the Goa Business School, undergoing MBA in Financial Services has successfully completed internship between 29/2/24 to 29/4/24 at KPT &Associates LLP. He actively participated in the activities during the period of internship and learned the skills needed for various activities such as assisting in GST filing for clients, managing and updating GST records, and using Tally for GST accounting.

KPT& Associates LLP
CA Sandesh Prabhukhanolkar
Partner

KPT & ASSOCIATES LLP
FRN-W100259
PANAJI
CHARTERED ACCOUNTANT

Place: Shiv Towers, Patto, Panaji Goa

Date: 29/04/2024

Profile of the organization

KPT & Associates, incorporated in June 2017, was founded by three young partners with a vision to provide valuable services in the audit, taxation, and GST sectors. The company's mission is to offer comprehensive and reliable financial solutions to its clients, ensuring compliance and efficiency in financial management. KPT & Associates prides itself on its commitment to excellence, integrity, and client satisfaction.

The company offers a range of services including audit, income tax filing, GST filing and consultancy, RERA consultancy, internal audit, and bank concurrent audit. These services cater to a diverse clientele including corporates, individuals, LLPs, trusts, and partnership firms. By providing tailored solutions to meet the specific needs of each client segment, KPT & Associates has established itself as a trusted partner in financial management.

Despite being a relatively young firm, KPT & Associates has quickly gained recognition for its exceptional service and commitment to excellence. While the company has not yet received any awards or accolades, it has achieved several key milestones in its journey towards becoming a leading financial services provider in the region.

The company's team comprises three senior partners who bring a wealth of experience and expertise in the field of finance and taxation. They are supported by a team of 25 staff members, including five senior staff members. With two officers situated in Maharashtra and one in Goa, KPT & Associates is well-positioned to serve clients across the region, delivering high-quality financial solutions with a personal touch.

Introduction

The coexistence of public and private sector banks is crucial in forming the financial ecosystem of India, given the country's dynamic banking landscape. In addition to serving as markers of the health of the industry, these banks' performance and stability are also important factors in determining stability and growth in the economy. Undertaking a comparative study of the financial performance of Indian public and private sector banks is therefore highly relevant.

Private sector banks have proliferated in India over the years, bringing with them efficiency, creativity, and customer-focused methods to banking operations. However, public sector banks continue to be the mainstay of India's banking system due to its extensive presence and historical relevance, especially in rural and semi-urban areas.

The study aims to conduct a comprehensive analysis over a five-year period, focusing on key financial indicators such as Net Interest Margin (NIM), Gross Non-Performing Assets (NPAs), Net Non-Performing Assets (NPAs), Net NPA to Net Advances Ratio, Capital Adequacy Ratio, Net Profit Margin, and CASA Ratio. By examining these metrics, the research attempts to offer insights into the relative strengths and weaknesses of public sector and private sector banks, thereby informing stakeholders, policymakers, and industry practitioners.

Drawing upon secondary data from reputable sources such as Money Control, Capitaline, and annual reports of banks, the study employs a meticulous methodology. The sample comprises the top five public sector banks and five private sector banks, selected based on market capitalization from the Nifty 500 index. The chosen study period spans from 2019 to 2023.

Literature review

The literature surrounding the comparative analysis of financial performance in the banking sector, particularly within the context of India, is abundant with studies that delve into various aspects of profitability, risk management, efficiency, and regulatory compliance. This section synthesizes key findings and insights from existing research, providing a foundation for understanding the complexities of financial performance evaluation in the Indian banking landscape.

Ten ratios were taken into account when Cheenu Goel & Chitwan Bhutani Rekhi (2013) examined the 2009–2012 performance of three Indian public and private sector banks. Overall, the analysis of the study indicates that the claim that new banks are more efficient than old ones is supported.

Using the CAMEL model, Sukanya (2019) examined the performance of five banks in India's public and private sectors. According to the report, Punjab National Bank had the lowest ranking while Kotak

Mahindra had the best performance and was placed #1 overall. All things considered; private sector banks have done better than public sector banks.

Bansal (2018) attempted to determine the new private sector bank's liquidity, solvency, and profitability status during a five-year study period.

In the context of the Indian banking industry, Bansal et al. (2018) looked into the relationships between profitability measurements like net profit margin (PM) and return on assets (ROA) and a number of independent variables. Panel data regression approaches were used in the study, including both fixed effects and random effects models. The Hausman's specification test was used to evaluate the selected strategy.

Guru & Mahalik (2019) used a combination of AHP, TOPSIS, and Grey Relational Analysis to try and determine the efficiency of a number of public sector banks in India.

Tamatam et al. (2019) emphasized the application of methods like data envelopment analysis. The study employs DEA models to assess public and private sector banks' performance over a ten-year period, with an emphasis on efficiency analysis in the banking sector, specifically in the Indian setting.

Regression analysis and the t-test were used by Nedunchezhian (2020) to examine the efficiency and financial performance of the top 5 private and public sector banks based on market capitulation. The analysis concluded that private sector banks are doing well overall.

Sureshbhai Vithalbhai et al. (2020) used statistical tools such as the One-Way ANOVA test, descriptive statistics, and the minimum and maximum net profit ratios to examine the financial performance of eight private sector banks. The analysis discovered that profit and effective management are the main reasons why HDFC Bank's financial performance is consistently strong.

Mohanty (2021)examined the financial results of ICICI Bank (private sector) and Indian overseas bank (public sector) for the years 2017–2021. The average financial performance was determined in this study using the mean statistical tool. The graphical presentation and T-test were also utilized to analyze the significant performance of the chosen banks based on the profitability, liquidity, and asset quality ratios.

Ali et al. (2022) analysed the financial performance of banks by applying robust regression analysis. The robust regression analysis was employed to find the impact of bank performance determinants on the performance of the Indian banking sector. The study found that bank size had no significance on the public-sector bank performance during the study period.

Kumar Agarwal (2022) selected the top 10 private sector and public sector banks for their study to analyze the financial performance of these banks. The study found out that public sector banks need to

improve in areas of Capital Adequacy ratio, Return on Equity, NPA to Net advance ratio, Return on Average Assets for better financial performance in future.

Afroj (2022) examined the factors that have affected the financial strength of 35 banks in Bangladesh between 2010 and 2015, as well as the financial strength of those institutions.

Research Objective

To conduct a comprehensive comparative analysis of selected private sector banks and public sector banks over a ten-year period, focusing on key financial indicators such as Net Interest Margin (NIM), Gross Non-Performing Assets (NPAs), Net Non-Performing Assets (NPAs), Net NPA to Net Advances Ratio, Capital Adequacy Ratio, Net Profit Ratio and CASA Ratio.

Methodology

The sample consists of the top 5 public sector banks and 5 private sector banks that were selected from a total of 16 private sector banks and 14 public sector banks in Nifty 500 on the basis of market capitalization. The study period was from 2013-2023. Sources for secondary data included money control, capitaline and annual reports of the banks. The statistical tools used to analyse the study was ratio analysis and ANOVA test. The statistical tools used for this study is graphical presentation of the ratios and ANOVA test. The Net Interest Margin (NIM) is calculated using the following formula: Net Interest Margin (NIM) = Net Interest Income/Total Earning Assets×100%. The formula to calculate the Net Non-Performing Assets (NPA) to Net Advances ratio is: Net NPA to Net Advances Ratio = Net NPA/Net Advances ×100 %. The formula for calculating the Capital Adequacy Ratio is: Capital Adequacy Ratio (CAR) = (Tier 1 Capital+ Tier 2 Capital) /Risk-Weighted Assets×100. The formula for calculating the Net Profit Margin is: Net Profit Margin (%) = Net Profit/Total Revenue ×100%. The formula for calculating the CASA ratio is: CASA Ratio (%) = (Total Current Account Deposits +Total Savings Account Deposits)/Total Deposits×100%.

Hypothesis

H01: There is no significant difference in the Net Interest Margin between private sector banks and public sector banks in India

H1: There is significant difference in the Net Interest Margin between private sector banks and public sector banks in India

H02: There is no significant difference in the Gross NPA between private sector banks and public sector banks in India

H2: There is significant difference in the Gross NPA between private sector banks and public sector banks in India

H03: There is no significant difference in the Net NPA between private sector banks and public sector banks in India

H3: There is significant difference in the Net NPA between private sector banks and public sector banks in India

H04: There is no significant difference in the Net NPA to Net Advances between private sector banks and public sector banks in India

H4: There is significant difference in the Net NPA to Net Advances between private sector banks and public sector banks in India

H05: There is no significant difference in the Capital Adequacy Ratio between private sector banks and public sector banks in India

H5: There is significant difference in the Capital Adequacy Ratio between private sector banks and public sector banks in India

H06: There is no significant difference in the Net profit margin between private sector banks and public sector banks in India

H6: There is significant difference in the Net profit margin between private sector banks and public sector banks in India

H07: There is no significant difference in the CASA ratio between private sector banks and public sector banks in India

H7: There is significant difference in the CASA ratio between private sector banks and public sector banks in India

Data Analysis

1. Net Interest Margin

A key statistic used to evaluate the efficiency and profitability of banks is the Net Interest Margin (NIM). It is the difference between interest expenses paid on deposits and other interest-bearing liabilities and interest income that banks make from loans and other interest-earning assets. NIM is a crucial metric for assessing their operational efficacy and capacity to efficiently handle their interest rate spread. The Net Interest Margin (NIM) is calculated using the following formula:

$$\text{Net Interest Margin (NIM)} = \text{Net Interest Income}/\text{Total Earning Assets} \times 100\%$$

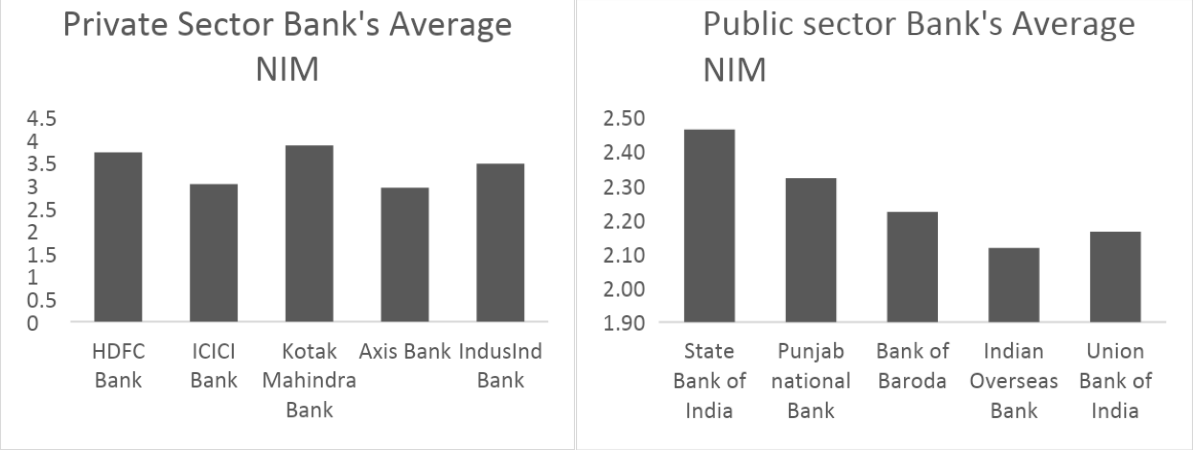
Table 1.1- Average Net Interest Margin of 10 years of Private and Public Sector Banks in India

Net Interest Margin (%)

Private Sector Banks	10-year average	Ranking	Public Sector Banks	10-year average	Ranking
HDFC Bank	3.73	2	State Bank of India	2.46	6
ICICI Bank	3.03	4	Punjab national Bank	2.32	7
Kotak Mahindra Bank	3.88	1	Bank of Baroda	2.22	8
Axis Bank	2.95	5	Indian Overseas Bank	2.12	10
IndusInd Bank	3.48	3	Union Bank of India	2.17	9

(Source: Secondary Data)

Graph 1.1: - Average Net Interest Margin of 10 years of Private and Public Sector Banks in India



(Source: Secondary Data)

The average net interest margin (NIM) of private sector banks is between 2.95% and 3.88%, with Kotak Mahindra Bank leading the way at 3.88% and HDFC Bank trailing closely behind at 3.73%. Among all banks taken into consideration, Kotak Mahindra Bank has the highest NIM, indicating strong management of interest rate spreads and effective asset-liability management practices. Notably, private sector banks hold the top four positions in terms of NIM ranking, indicating their consistent performance in generating higher interest income relative to interest expenses.

State Bank of India has the highest NIM among PSBs, at 2.46%, whereas the average NIM of public sector banks is between 2.12% and 2.46%. Indian Overseas Bank and Union Bank of India report the lowest NIM values, placing public sector banks at the bottom of the NIM table. State Bank of India lags behind all private sector banks in terms of NIM performance, while having a comparatively greater NIM than other PSBs.

In terms of profitability gained from interest-based activities, private sector banks perform better compared to the public sector bank. Private sector banks routinely rank first and have higher NIM values, indicating that they are more adept at controlling interest rate spreads and maximizing interest income. Conversely, public sector banks have lower NIM values and rank lower in the ranking, suggesting that they may face difficulties in generating interest income and effectively managing interest expenses.

Table 1.2: One way ANOVA test of Net interest margin on private sector banks and public sector banks in India

Groups	***Count***	***Sum***	***Average***	***Variance***
Private Sector Banks	5	17.07	3.414	0.17103
Public Sector Banks	5	11.291	2.2582	0.019072

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	3.339684	1	3.339684	35.13576	0.000351	5.317655
Within Groups	0.760407	8	0.095051			
Total	**4.100091**	**9**				

The F-value obtained from the ANOVA test is 35.136, with a corresponding p-value of 0.000351. Since the p-value is less than 0.05, we reject the null hypothesis 1 and conclude that there is a significant difference in the NIM between Private Sector Banks and Public Sector Banks.

The between-groups variation (3.340) is much larger than the within-groups variation (0.760), suggesting that a significant portion of the total variance in the NIM can be explained by the difference between the two types of banks.

The average of the NIM for Private Sector Banks (3.414) is higher than that for Public Sector Banks (2.258), indicating that, on average, Private Sector Banks outperform Public Sector Banks on Net Interest Margin.

2. Gross Non-Performing Assets

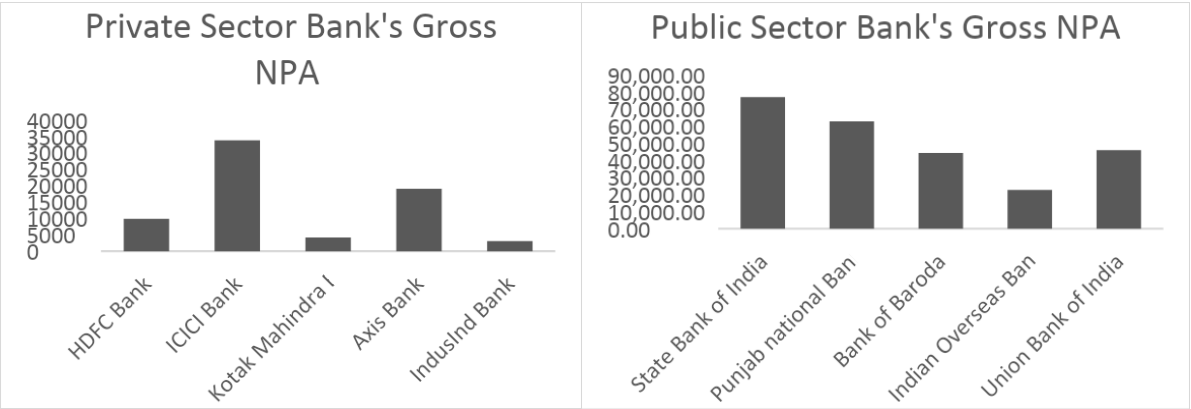
Gross Non-Performing Assets (NPAs) refer to loans or advances made by a bank that have turned non-performing, meaning the borrower has failed to make scheduled repayments of principal and/or interest for a specified period of time, usually 90 days or more past due. Gross NPAs include all such loans/assets that are classified as non-performing on the bank's balance sheet without taking into account any provisions made for potential losses. Gross Non-Performing Assets (NPAs) are a critical indicator of a bank's asset quality and financial health.

Table 2.1: Average Gross Non-Performing assets of 10 years of Private and Public Sector Banks in India

Gross non-performing assets (in CR)					
Private Sector Banks	**10-year average**	**Ranking**	**Public Sector Banks**	**10-year average**	**Ranking**
HDFC Bank	9,843.32	3	State Bank of India	76,857.82	10
ICICI Bank	33,784.9	6	Punjab national Bank	62,678.99	9
Kotak Mahindra Bank	4,169.72	2	Bank of Baroda	44,296.57	7
Axis Bank	18,979.6	4	Indian Overseas Bank	22,627.41	5
IndusInd Bank	3,095.29	1	Union Bank of India	45,802.47	8

(Source: Secondary Data)

Graph 2.1: Average Gross Non-Performing assets of 10 years of Private and Public Sector Banks in India



(Source: Secondary Data)

Private sector banks exhibit a range of gross non-performing assets (GNPAs), with averages between 3,095.29 and 33,784.9 crores. With the lowest GNPA average of 3095.29 crores, IndusInd Bank is the leading private sector bank, demonstrating strong asset quality management procedures. With a GNPA average of 9,843.32 crores, HDFC Bank comes in third, not far behind, further demonstrating the industry's generally good performance in controlling non-performing assets.

The average gross non-performing asset (GNPA) of public sector banks is larger than that of private sector banks; the range of data is 22,627.41 crores to 76,857.82 crores.

With the lowest GNPA average among PSBs—22,627.41 crores—Indian Overseas Bank takes first place, while it is still greater than the lowest GNPA average among private sector banks. With a GNPA average of 76,857.82 crores, State Bank of India, the biggest public sector bank, comes in fifth place, suggesting serious difficulties in handling non-performing assets.

According to the GNPA comparison analysis, private sector banks typically demonstrate better asset quality management than their public sector counterparts. Higher rankings and lower GNPA averages are maintained by private sector banks, which is indicative of better risk reduction and loan portfolio management techniques. Public sector banks, on the other hand, have a harder time managing non-performing assets; as seen by their lower overall rankings and higher GNPA averages. Consequently, private sector banks outperform public sector banks in terms of asset quality management during the study period, according to the GNPA metric.

Table 2.2: One way ANOVA test of Gross NPA on private sector banks and public sector banks in India

Groups	***Count***	***Sum***	***Average***	***Variance***
Private Sector Banks	5	69872.83	13974.57	1.62E+08
Public Sector Banks	5	252263.3	50452.65	4.2E+08

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	3326626896	1	3.33E+09	11.42414	0.009642	5.317655
Within Groups	2329542116	8	2.91E+08			
Total	**5656169011**	**9**				

The F-value obtained from the ANOVA test is 11.424, with a corresponding p-value of 0.009642. Since the p-value is less than 0.05, we reject the null hypothesis 2 and conclude that there is a significant difference in Gross NPA between Private Sector Banks and Public Sector Banks in India.

The between-groups variation (3.33E+09) is substantial compared to the within-groups variation (2.91E+08), suggesting that a significant portion of the total variance in Gross NPA can be explained by the difference between the two types of banks.

On average, Public-Sector Banks have higher Gross NPA (50452.65) compared to Private Sector Banks (13974.57), indicating a difference in the financial health of banks based on their ownership structure.

3. Net Non-Performing Assets

Net Non-Performing Assets (NPAs) are a critical indicator of a bank's asset quality and financial stability. Net NPAs represent the amount of non-performing loans/assets after deducting provisions

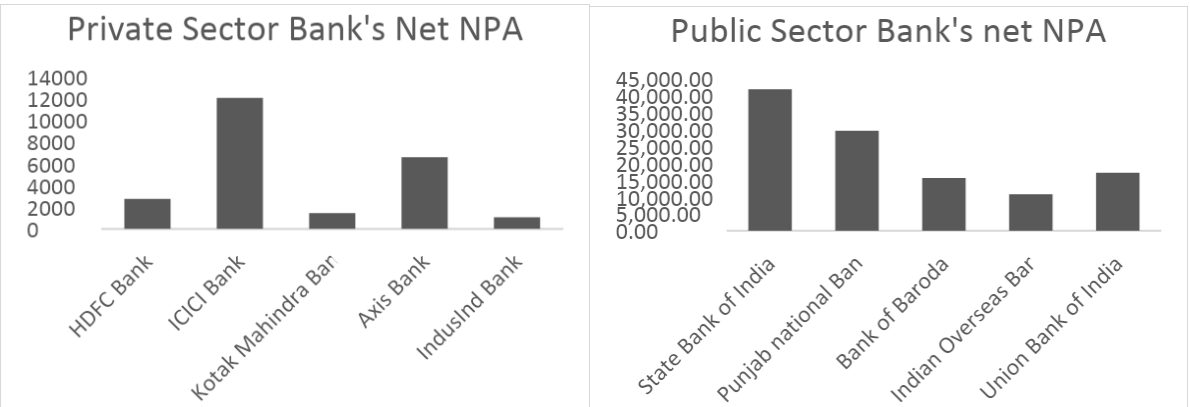
made for potential losses, providing a clearer picture of the actual impact of non-performing assets on a bank's balance sheet.

Table 3.1: Average Net Non-Performing assets of 10 years of Private and Public Sector Banks in India

Net non-performing assets (in CR)					
Private Sector Banks	**10-year average**	**Ranking**	**Public Sector Banks**	**10-year average**	**Ranking**
HDFC Bank	2,756.95	3	State Bank of India	41,864.35	10
ICICI Bank	12,012.9	6	Punjab national Bank	29,544.85	9
Kotak Mahindra Bank	1,456.52	2	Bank of Baroda	15,580.84	7
Axis Bank	6,589.57	4	Indian Overseas Bank	10,747.23	5
IndusInd Bank	1,075.71	1	Union Bank of India	17,159.04	8

(Source: Secondary Data)

Graph 3.1: Average Net Non-Performing assets of 10 years of Private and Public Sector Banks in India



(Source: Secondary Data)

The net non-performing assets (NNPA) of private sector banks vary, with averages ranging from 1,075.71 crores to 12,012.9 crores. With the lowest NNPA average of 1,075.71 crores among private sector banks, IndusInd Bank is in the lead thanks to strong provisioning procedures and efficient credit

risk management. With a NNPA average of 1,456.52 crores, Kotak Mahindra Bank ranks second, not far behind, underscoring the industry's generally excellent asset quality management.
When comparing public sector banks to private sector banks, the NNPA averages of the former are greater, ranging from 10,747.23 crores to 41,864.35 crores. With the lowest net national poverty average of 10,747.23 crores, Indian Overseas Bank tops the list of PSBs; nevertheless, its average is still greater than that of the lowest net national poverty average among private sector banks. With an average NNPA of 41,864.35 crores, State Bank of India, the biggest public sector bank, comes in fifth place, suggesting serious difficulties in managing net non-performing assets.

According to the NNPA comparison analysis, private sector banks often exhibit better asset quality management than their public sector counterparts. Higher ranks and lower NNPA averages are maintained by private sector banks, which are indicative of better credit risk management techniques and more efficient provisioning for possible loan losses. Public sector banks, on the other hand, have a harder time controlling net non-performing assets; as seen by their lower overall rankings and higher average NNPA. Consequently, private sector banks performed better than public sector banks in terms of asset quality management over the study period, according to the NNPA metric.

Table 3.2: One way ANOVA test of Net NPA on private sector banks and public sector banks in India

Groups	***Count***	***Sum***	***Average***	***Variance***
Private Sector Banks	5	23891.62	4778.324	21112238
Public Sector Banks	5	114896.3	22979.26	1.59E+08

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	828185360.2	1	8.28E+08	9.171022	0.01635	5.317655
Within Groups	722436686.6	8	90304586			
Total	**1550622047**	**9**				

The F-value obtained from the ANOVA test is 9.171, with a corresponding p-value of 0.01635. Since the p-value is less than 0.05, we reject the null hypothesis 3 and conclude that there is a significant difference in Net NPA between Private Sector Banks and Public Sector Banks in India.

The between-groups variation (8.28E+08) is substantial compared to the within-groups variation (9.03E+07), suggesting that a significant portion of the total variance in Net NPA can be explained by the difference between the two types of banks.

On average, Public-Sector Banks have higher Net NPA (22979.26) compared to Private Sector Banks (4778.324), indicating a difference in the financial health of banks based on their ownership structure.

4. Net NPA to Net Advances

The Net Non-Performing Assets (NPAs) to Net Advances ratio is a critical metric used to assess the asset quality and credit risk management of banks. It indicates the proportion of non-performing assets relative to the total advances or loans extended by the bank. The formula to calculate the Net Non-Performing Assets (NPA) to Net Advances ratio is:

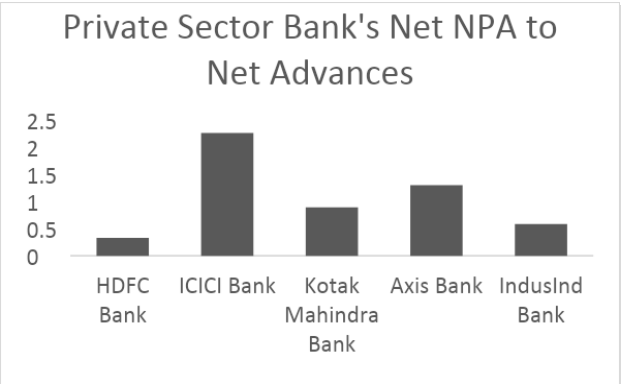
$$\text{Net NPA to Net Advances Ratio} = \text{Net NPA}/\text{Net Advances} \times 100\ \%$$

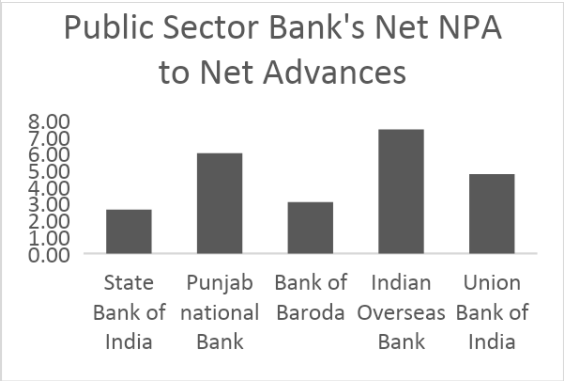
Table 4.1: Average Net NPA to Net Advances of 10 years of Private and Public Sector Banks in India

Net NPA to Net advances (%)					
Private Sector Banks	**10-year average**	**Ranking**	**Public Sector Banks**	**10-year average**	**Ranking**
HDFC Bank	0.33	1	State Bank of India	2.64	6
ICICI Bank	2.28	5	Punjab national Bank	6.02	9
Kotak Mahindra Bank	0.9	3	Bank of Baroda	3.08	7
Axis Bank	1.31	4	Indian Overseas Bank	7.44	10
IndusInd Bank	0.59	2	Union Bank of India	4.76	8

(Source: Secondary Data)

Graph 4.1: Average Net NPA to Net Advances of 10 years of Private and Public Sector Banks in India





(Source: Secondary Data)

With ratios of 0.33% and 0.59%, respectively, HDFC Bank and IndusInd Bank exhibit exceptionally high performance among PVSBs, which generally maintain lower Net NPA to Net Advances ratios. Overall, as shown by their consistently lower Net NPA to Net Advances ratios, PVSBs have better asset quality and handle NPAs more effectively than PSBs.

The Net NPA to Net Advances ratios of PSBs vary greatly; Indian Overseas Bank has the highest 10-year average ratio (7.44%), while State Bank of India has a very low ratio (2.64%). In comparison to PVSBs, PSBs typically have a greater Net NPA to Net Advances ratio, indicating comparatively lower asset quality and a larger percentage of non-performing loans in their portfolios.

Based on their lower Net NPA to Net Advances ratios, private sector banks did better at managing non-performing assets (NPAs) than public sector banks. PVSBs that exhibit excellent asset quality and efficient NPA management procedures, like HDFC Bank and Kotak Mahindra Bank, are noteworthy for their overall resilience and stability in the financial system. On the other hand, PSBs have an average ratio that is higher, which suggests that non-performing assets are more common in their loan portfolios.

Table 4.2: One way ANOVA test of Net NPA to Net advances on private sector banks and public sector banks in India

Groups	***Count***	***Sum***	***Average***	***Variance***
Private Sector Banks	5	5.41	1.082	0.58197
Public Sector Banks	5	23.939	4.7878	4.018045

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	34.3323841	1	34.33238	14.92707	0.004785	5.317655
Within Groups	18.4000608	8	2.300008			
Total	**52.7324449**	**9**				

The F-value obtained from the ANOVA test is 14.927, with a corresponding p-value of 0.004785. Since the p-value is less than 0.05, we reject the null hypothesis 4 and conclude that there is a significant difference in the ratio of Net NPA to Net Advances between Private Sector Banks and Public Sector Banks in India.

The between-groups variation (34.33238) is substantial compared to the within-groups variation (2.300008), suggesting that a significant portion of the total variance in the ratio of Net NPA to Net Advances can be explained by the difference between the two types of banks.

On average, Public-Sector Banks have a higher ratio of Net NPA to Net Advances (4.7878) compared to Private Sector Banks (1.082), indicating potentially higher risk in the loan portfolios of Public Sector Banks.

5. Capital Adequacy Ratio

The Capital Adequacy Ratio (CAR) serves as a critical measure of a bank's financial strength and ability to absorb potential losses. It indicates the proportion of a bank's capital to its risk-weighted assets and is essential for ensuring the stability and resilience of the banking system. The formula for calculating the Capital Adequacy Ratio is:

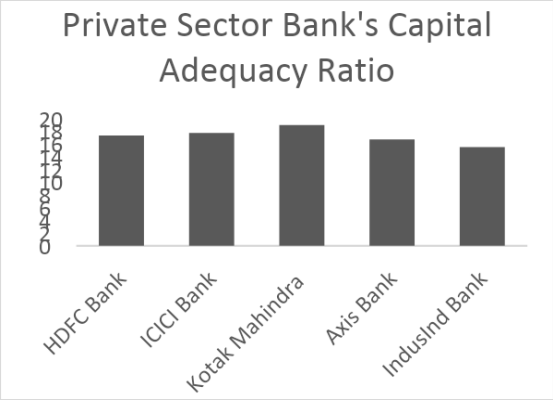
Capital Adequacy Ratio (CAR) = (Tier 1 Capital+ Tier 2 Capital) /Risk-Weighted Assets×100

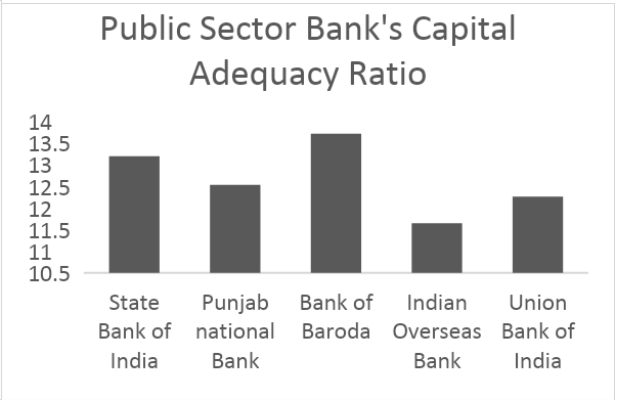
Table 5.1: Average Capital Adequacy Ratio of 10 years of Private and Public Sector Banks in India

Capital Adequacy Ratio (%)					
Private Sector Banks	**10-year average**	**Ranking**	**Public Sector Banks**	**10-year average**	**Ranking**
HDFC Bank	17.31	3	State Bank of India	13.19	7
ICICI Bank	17.68	2	Punjab national Bank	12.53	8
Kotak Mahindra Bank	18.94	1	Bank of Baroda	13.71	6
Axis Bank	16.66	4	Indian Overseas Bank	11.65	10
IndusInd Bank	15.46	5	Union Bank of India	12.26	9

(Source: Secondary Data)

Graph 5.1: Average Capital Adequacy Ratio of 10 years of Private and Public Sector Banks in India





(Source: Secondary Data)

PVSBs showcase higher Capital Adequacy Ratios on average, with Kotak Mahindra Bank leading the group with a ratio of 18.94%, followed closely by ICICI Bank with 17.68%. PVSBs, overall, demonstrate stronger capital positions and a greater capacity to absorb financial shocks compared to PSBs, as evidenced by their consistently higher CARs.

PSBs exhibit a range of Capital Adequacy Ratios, with Indian Overseas Bank recording the lowest 10-year average ratio of 11.65% and State Bank of India displaying a comparatively higher ratio of 13.19%. PSBs, on average, maintain relatively lower CARs compared to PVSBs, indicating potential challenges in accumulating and maintaining adequate capital reserves to mitigate risks and absorb losses.

Overall, Private sector banks perform better than public sector banks overall in terms of capital adequacy, which emphasizes the significance of substantial capital reserves in guaranteeing resilience and stability in the financial system. Stronger capital positions and risk management skills are displayed by PVSBs, highlighting their relative advantage in keeping sufficient capital buffers to enable long-term growth and reduce systemic concerns in the banking industry.

Table 5.2: One way ANOVA test of Capital Adequacy Ratio on private sector banks and public sector banks in India

Groups	***Count***	***Sum***	***Average***	***Variance***
Private Sector Banks	5	86.05	17.21	1.6472
Public Sector Banks	5	63.344	12.6688	0.648592

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	51.5562436	1	51.55624	44.91369	0.000152	5.317655

Within Groups	9.1831668	8	1.147896			
Total	**60.7394104**	**9**				

The F-value obtained from the ANOVA test is 44.91369, with a corresponding p-value of 0.000152. Since the p-value is less than 0.05, we reject the null hypothesis 5 and conclude that there is a significant difference in the Capital Adequacy Ratio between Private Sector Banks and Public Sector Banks in India.

The between-groups variation (51.55624) is substantial compared to the within-groups variation (1.147896), suggesting that a significant portion of the total variance in the Capital Adequacy Ratio can be explained by the difference between the two types of banks.

On average, Private Sector Banks have a higher Capital Adequacy Ratio (17.21) compared to Public Sector Banks (12.6688), indicating potentially better capital reserves and risk management in Private Sector Banks.

6. Net Profit Margin

Net Profit Margin (NPM) is a crucial financial metric that indicates the profitability of a company by measuring the percentage of net profit generated from its total revenue. In the banking sector, NPM reflects the efficiency of operations, cost management, and revenue generation capabilities. The formula for calculating the Net Profit Margin is:

$$\text{Net Profit Margin (\%)} = \text{Net Profit}/\text{Total Revenue} \times 100\%$$

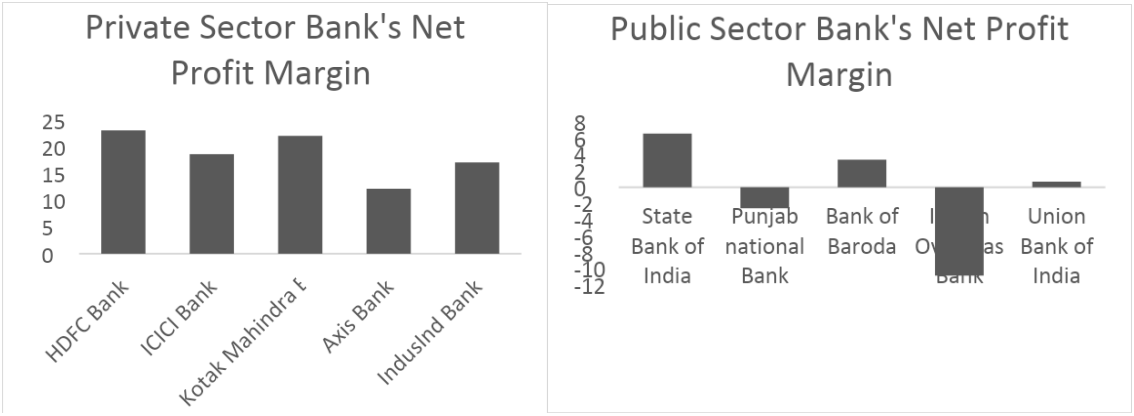
Table 6.1: Average Net Profit Margin of 10 years of Private and Public Sector Banks in India

Net profit margin (%)					
Private Sector Banks	**10-year average**	**Ranking**	**Public Sector Banks**	**10-year average**	**Ranking**
HDFC Bank	23.1	1	State Bank of India	6.59	1
ICICI Bank	18.64	3	Punjab national Bank	-2.56	4
Kotak Mahindra Bank	22.1	2	Bank of Baroda	3.39	2
Axis Bank	12.2	5	Indian Overseas Bank	-10.83	5

IndusInd Bank	17.13	4	Union Bank of India	0.71	3

(Source: Secondary data)

Graph 6.1: Average Net Profit Margin of 10 years of Private and Public Sector Banks in India



(Source: Secondary Data)

PVSBs showcase higher Net Profit Margins on average, with HDFC Bank leading the group with a robust margin of 23.1%, followed closely by Kotak Mahindra Bank with 22.1%. PVSBs, overall, demonstrate stronger profitability and operational efficiency compared to PSBs, as evidenced by their consistently higher NPMs.

PSBs exhibit a wide range of Net Profit Margins, with Punjab National Bank recording a negative 10-year average margin of -2.56% and Union Bank of India displaying a relatively low margin of 0.711%. PSBs, on average, demonstrate lower profitability compared to PVSBs, with several banks reporting negative margins or minimal profits, indicating challenges in generating sustainable earnings.

Overall, Private sector banks outperform public sector banks in terms of profitability, highlighting the importance of operational efficiency and effective risk management practices in driving financial performance. PVSBs demonstrate stronger profitability margins, positioning them as preferred choices for investors seeking exposure to the Indian banking sector. In contrast, PSBs face challenges in enhancing profitability levels and may require strategic interventions to improve operational efficiency and competitiveness in the market.

Table 6.2: One way ANOVA of Net profit Margin on private sector banks and public sector banks in India

Groups	***Count***	***Sum***	***Average***	***Variance***
Private Sector Banks	5	93.17	18.634	18.90418
Public Sector Banks	5	-2.695	-0.539	44.46389

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	919.0098225	1	919.0098	29.00546	0.000657	5.317655
Within Groups	253.472264	8	31.68403			
Total	**1172.482087**	**9**				

The F-value obtained from the ANOVA test is 29.00546, with a corresponding p-value of 0.000657. Since the p-value is less than 0.05, we reject the null hypothesis 6 and conclude that there is a significant difference in the Net Profit Margin between Private Sector Banks and Public Sector Banks in India.

The between-groups variation (919.0098) is substantial compared to the within-groups variation (31.68403), suggesting that a significant portion of the total variance in the Net Profit Margin can be explained by the difference between the two types of banks.

On average, Private Sector Banks have a higher Net Profit Margin (18.634) compared to Public Sector Banks (-0.539), indicating potentially better profitability in Private Sector Banks.

7. CASA Ratio

The Current Account Savings Account (CASA) ratio is a critical metric for banks, representing the proportion of low-cost deposits (current and savings accounts) to total deposits. A higher CASA ratio indicates a lower cost of funds for the bank and greater stability in its funding base. The formula for calculating the CASA ratio is:

$$\text{CASA Ratio (\%)} = (\text{Total Current Account Deposits} + \text{Total Savings Account Deposits}) / \text{Total Deposits} \times 100\%$$

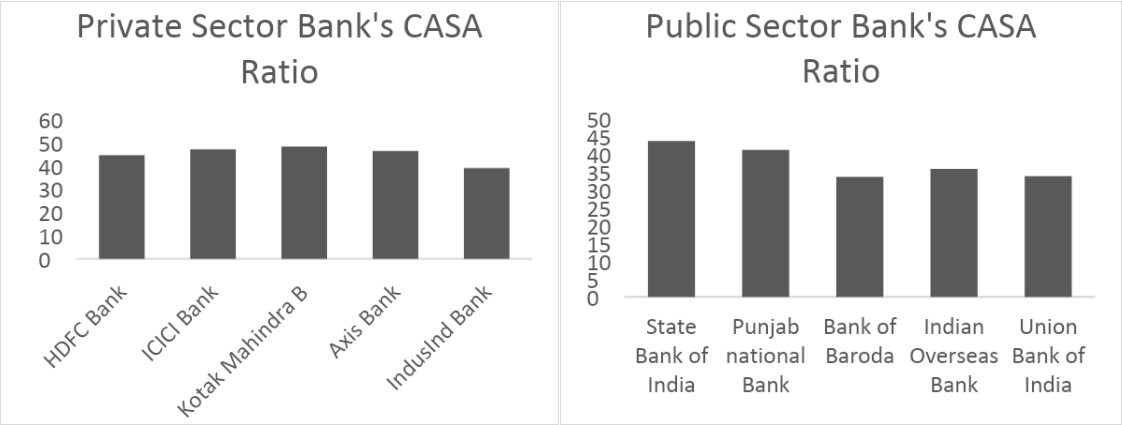
Table 7.1: Average CASA Ratio of 10 years of Private and Public Sector Banks in India

CASA ratio (%)					
Private Sector Banks	**10-year average**	**Ranking**	**Public Sector Banks**	**10-year average**	**Ranking**
HDFC Bank	44.69	4	State Bank of India	43.841	5
ICICI Bank	47.17	2	Punjab national Bank	41.31	6
Kotak Mahindra Bank	48.36	1	Bank of Baroda	33.78	10

Axis Bank	46.49	3	Indian Overseas Bank	36.02	8
IndusInd Bank	39.09	7	Union Bank of India	33.94	9

(Source: Secondary data)

Graph 7.1: Average CASA Ratio of 10 years of Private and Public Sector Banks in India



(Source: Secondary Data)

PVSBs demonstrate superior performance in garnering low-cost deposits, with higher CASA ratios on average, reflecting their effective deposit mobilization strategies and customer engagement initiatives. PVSBs, such as Kotak Mahindra Bank and ICICI Bank, exhibit commendable CASA ratios, positioning them well to access low-cost funding and enhance profitability.

PSBs maintain moderate CASA ratios on average, indicating a substantial reliance on current and savings account deposits to fund their operations. While some PSBs exhibit commendable CASA ratios, the sector as a whole may face challenges in attracting a higher proportion of low-cost deposits compared to PVSBs.

Overall, private sector banks outperform public sector banks in terms of CASA ratio performance, highlighting their comparative advantage in attracting low-cost deposits and reducing funding costs.

Table 7.2: One way ANOVA test of Net profit Margin on private sector banks and public sector banks in India

Groups	***Count***	***Sum***	***Average***	***Variance***
Private Sector Banks	5	225.8	45.16	13.2787
Public Sector Banks	5	188.89	37.778	20.77691

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	136.23481	1	136.2348	8.000726	0.0222	5.317655
Within Groups	136.222446	8	17.02781			
Total	**272.457256**	**9**				

The F-value obtained from the ANOVA test is 8.000726, with a corresponding p-value of 0.0222. Since the p-value is less than 0.05, we reject the null hypothesis 7 and conclude that there is a significant difference in the Net Profit Margin between Private Sector Banks and Public Sector Banks in India.

The between-groups variation (136.2348) is substantial compared to the within-groups variation (17.02781), suggesting that a significant portion of the total variance in the Net Profit Margin can be explained by the difference between the two types of banks.

On average, Private Sector Banks have a slightly higher Net Profit Margin (45.16) compared to Public Sector Banks (37.778), indicating potentially better profitability in Private Sector Banks.

Findings

The study found out that private sector banks routinely perform better than public sector banks on a number of different metrics, demonstrating their greater financial stability and operational effectiveness. Information about the relative strengths of private sector banks in terms of profitability, asset quality management, capital adequacy, and deposit mobilization is provided by metrics such as Net Interest Margin (NIM), Gross Non-Performing Assets (GNPAs), Net Non-Performing Assets (NNPAs), Net NPA to Net Advances ratio, Capital Adequacy Ratio (CAR), Net Profit Margin (NPM), and CASA Ratio. Among private sector banks, Kotak Mahindra Bank stands out for its exceptional performance. It leads in a number of indicators, such as NIM, GNPAs, the ratio of Net NPA to Net Advances, and the CASA Ratio, all of which are indicative of strong risk management and effective operations Public sector banks, on the other hand, deal with issues including greater percentages of non-performing assets, smaller profit margins, and generally worse capital positions. Despite being the biggest public sector bank, State Bank of India trails private sector banks in important measures such as NIM, NPM, and CAR. In the Indian banking industry, private sector banks are generally more resilient and competitive, which highlights the significance of effective management techniques and customer-focused strategies in promoting long-term growth and profitability.

Conclusion and Suggestions

In conclusion, while private sector banks typically outperformed public sector banks in terms of operational efficiency, asset quality, capital strength, and profitability, there are notable instances of improvement among certain public sector banks. The findings suggest that public sector banks are making concerted efforts to enhance their financial performance and bridge the gap with their private

sector counterparts. Continued reforms and strategic initiatives are crucial for both sectors to ensure sustained growth, stability, and resilience in India's banking industry.

The suggestions would be to extend the research period beyond 10 years to capture additional trends and fluctuations in asset quality management over time. A more extended analysis could provide deeper insights into the long-term performance and resilience of banks in managing non-performing assets. Incorporate macro-economic variables such as GDP growth, inflation rates, and interest rate fluctuations into the analysis to assess their impact on asset quality and risk management practices.

Managerial Implications:

- Strategic Alignment: This study suggests that managers in both public and private sector banks should focus on operational efficiency, asset quality management, and profitability, while enhancing asset quality and capital adequacy.
- Risk Management: Managers should prioritize risk management practices, particularly in private and public sector banks, to maintain competitiveness and mitigate credit risk by effectively managing Gross and Net NPAs.
- Capital Allocation: The Capital Adequacy Ratio serves as a measure of a bank's financial strength and ability to absorb potential losses. Managers, especially in public sector banks witnessing improvements in CAR, should allocate capital prudently to support growth initiatives while maintaining regulatory compliance. Private sector banks, with their relatively stronger CARs, should explore avenues for strategic expansion and investment.
- Operational Efficiency: Net Interest Margin and Net Profit Margin are key indicators of operational efficiency and profitability. Managers across both sectors should focus on optimizing interest rate spreads, reducing operating costs, and enhancing revenue generation capabilities. Private sector banks can leverage their strong performance in these areas to further cement their market position, while public sector banks should strive to narrow the performance gap.
- Deposit Mobilization: The CASA Ratio reflects the stability of a bank's funding base. Managers, particularly in public sector banks with strong CASA ratios, should continue efforts to mobilize low-cost deposits to reduce funding costs and enhance profitability. Private sector banks should maintain stability in their CASA ratios while exploring innovative strategies to attract and retain customers for sustainable deposit growth.

References

Afroj, F. (2022). Financial strength of banking sector in Bangladesh: a CAMEL framework analysis. *Asian Journal of Economics and Banking*, *6*(3), 353–372. https://doi.org/10.1108/ajeb-12-2021-0135

Ali, M. A., Pervez, A., Bansal, R., & Khan, M. A. (2022). Analyzing Performance of Banks in India: A Robust Regression Analysis Approach. *Discrete Dynamics in Nature and Society*, *2022*. https://doi.org/10.1155/2022/8103510

Bansal, R. (2018). Comparative Performance Analysis of New Private Sector Banks in India. *RESEARCH REVIEW International Journal*. www.rrjournals.com[UGCListedJournal]

Bansal, R., Singh, A., Kumar, S., & Gupta, R. (2018). Evaluating factors of profitability for Indian banking sector: a panel regression. *Asian Journal of Accounting Research*, *3*(2), 236–254. https://doi.org/10.1108/AJAR-08-2018-0026

Cheenu Goel, & Chitwan Bhutani Rekhi. (2013). *A Comparative Study on the Performance of Selected Public Sector and Private Sector Banks in India*. www.borjournals.com

Guru, S., & Mahalik, D. K. (2019). A comparative study on performance measurement of Indian public sector banks using AHP-TOPSIS and AHP-grey relational analysis. *OPSEARCH*, *56*(4), 1213–1239. https://doi.org/10.1007/s12597-019-00411-1

Kumar Agarwal, M. (2022). A Comparative Study of the Performance of Selected Public and Private Sector Banks in India. In *Journal of Advances and Scholarly Researches in Allied Education* (Vol. 19, Issue 2). www.ignited.in

Mohanty, S. (2021). A Comparative Financial Performance of Selected Public And Private Sector Banks in India. *Parikalpana: KIIT Journal of Management*, *17*(2), 155. https://doi.org/10.23862/kiit-parikalpana/2021/v17/i2/210548

Nedunchezhian, V. (2020). *FINANCIAL PERFORMANCE ANALYSIS-A COMPARATIVE STUDY OF SELECTED PUBLIC SECTOR AND PRIVATE SECTOR BANKS* (Vol. 6). www.ijariie.com

Sukanya, M. (2019). Financial performance of select public and private sector banks in India by using "Camel model." *International Journal of Innovative Technology and Exploring Engineering*, *8*(6 Special Issue 4), 807–809. https://doi.org/10.35940/ijitee.F1162.0486S419

Sureshbhai Vithalbhai, V., Info, A., & Sureshbhai Vithalbhai Email, V. (2020). Financial Performance of Banks in India: A Study of Selected Private Sector Banks. *Journal of Advanced Research in Economics and Administrative Sciences*, *1*, 2708–9320. https://bcsdjournals.com/index.php/jareas

Tamatam, R., Dutta, P., Dutta, G., & Lessmann, S. (2019). Efficiency analysis of Indian banking industry over the period 2008–2017 using data envelopment analysis. *Benchmarking*, *26*(8), 2417–2442. https://doi.org/10.1108/BIJ-12-2018-0422