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Beyond Bad Loans: A Comparative Analysis of Non-Performing Assets in Indian Banks

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Abstract—**The Indian banking sector plays a crucial role in supporting economic growth by mobilizing savings and providing credit to individuals, businesses, and industries. However, the rising level of Non-Performing Assets (NPAs) has emerged as one of the most significant challenges affecting the stability and profitability of banks. High NPAs reduce income generation, increase provisioning requirements, weaken capital adequacy, and adversely affect banks' lending capacity. Effective management of NPAs is therefore essential for ensuring financial stability and sustainable economic development. This study aims to compare the performance of selected public sector, private sector, and cooperative banks in India with respect to their Gross Non-Performing Assets (GNPA) and Net Non-Performing Assets (NNPA). The study covers six banks, namely State Bank of India (SBI), Bank of Baroda (BOB), HDFC Bank, ICICI Bank, Nasik Merchants Cooperative Bank (NAMCO), and Saraswat Cooperative Bank, during the period from 2018–19 to 2022–23. Secondary data were collected from the published annual reports of the selected banks and the Reserve Bank of India (RBI). A descriptive research design was adopted, and statistical tools including percentage analysis, mean, standard deviation, coefficient of variation, trend analysis, graphical presentation, and one-way Analysis of Variance (ANOVA) were employed to analyse the data. The findings reveal significant differences in NPA performance among the selected banks. Private sector banks consistently maintained lower Gross and Net NPA ratios owing to stronger credit appraisal systems, effective risk management practices, and technology-driven monitoring. Public sector banks demonstrated substantial improvement in asset quality during the study period following regulatory reforms and enhanced recovery mechanisms. Cooperative banks exhibited relatively higher fluctuations in NPAs due to operational and governance challenges. The study concludes that effective credit risk management, timely loan recovery, digital monitoring systems, and prudent lending practices are essential for reducing NPAs and improving banking efficiency. The findings provide useful insights for policymakers, regulators, banking professionals, and researchers in designing effective strategies for strengthening asset quality and promoting sustainable growth in the Indian banking sector.**

Index Terms—**Asset Quality, Banking Performance, Non-Performing Assets, Gross NPA, Net NPA, Private Sector Banks, Public Sector Banks.**

I. INTRODUCTION

The banking sector is one of the most important pillars of the Indian economy as it facilitates financial intermediation, mobilizes savings, provides credit, and supports economic development. Banks contribute significantly to industrial growth, employment generation, infrastructure development, and financial inclusion. Since the economic reforms of 1991, the Indian banking industry has experienced substantial transformation through liberalization, technological advancement, improved regulatory frameworks, and increased competition. Despite these developments, the accumulation of Non-Performing Assets (NPAs) remains one of the most critical challenges affecting the banking system.

A Non-Performing Asset (NPA) refers to a loan or advance in which the repayment of principal or interest remains overdue for more than 90 days as per the Reserve Bank of India's prudential norms. NPAs directly affect the profitability, liquidity, operational efficiency, and financial soundness of banks. Rising NPAs compel banks to make higher provisions against doubtful assets, thereby reducing their profitability and restricting their lending capacity. Consequently, effective management of NPAs has become a strategic priority for banks and regulators alike.

The problem of NPAs has been more pronounced in public sector banks due to their larger exposure to infrastructure projects, corporate lending, and priority sector financing. In contrast, private sector banks have generally maintained lower NPA ratios by adopting stringent credit appraisal systems, advanced risk management techniques, and technology-enabled monitoring. Cooperative banks, although playing an essential role in promoting financial inclusion and rural development, often face governance issues, limited capital resources, and weaker recovery mechanisms, resulting in comparatively unstable asset quality.

Recognizing the adverse impact of NPAs on financial stability, the Government of India and the Reserve Bank of India have introduced several policy measures, including the Insolvency and Bankruptcy Code (IBC), the SARFAESI Act, Debt Recovery Tribunals (DRTs), Asset Reconstruction Companies (ARCs), Prompt Corrective Action (PCA), and strengthened prudential norms for asset classification and provisioning. These reforms have contributed significantly to improving asset quality across the banking sector.

Against this backdrop, the present study undertakes a comparative analysis of NPAs among selected public sector, private sector, and cooperative banks in India. By comparing Gross and Net NPA trends over the period from 2018–19 to 2022–23, the study seeks to evaluate differences in asset quality, credit risk management, and recovery performance across different categories of banks. The findings are expected to provide valuable insights for bankers, policymakers, regulators, investors, and researchers in strengthening the resilience and efficiency of the Indian banking system.

II. LITERATURE REVIEW

Several researchers have examined the determinants, trends, and implications of Non-Performing Assets (NPAs) in the Indian banking sector. Recent studies indicate that although asset quality has improved considerably after banking reforms, NPAs continue to pose challenges for sustainable banking growth.Kaur and Singh (2021) found that public sector banks experienced significantly higher Gross NPAs than private sector banks because of greater exposure to corporate lending and infrastructure financing. The study emphasized strengthening credit appraisal mechanisms and continuous monitoring of stressed assets.

Sharma and Gupta (2021) observed that the Insolvency and Bankruptcy Code (IBC) substantially improved recovery rates in scheduled commercial banks. The study reported that faster resolution of stressed assets contributed to reducing Gross NPAs and improving capital adequacy.Patel and Mehta (2022) examined the relationship between NPAs and profitability across Indian commercial banks. Their findings revealed a significant negative relationship between Gross NPAs and Return on Assets (ROA), indicating that increasing NPAs reduce operational efficiency and shareholder value.Kumar and Verma (2022) compared asset quality among public, private, and cooperative banks and concluded that private sector banks consistently maintained better asset quality due to stronger governance practices, digital credit monitoring systems, and effective risk management frameworks.

RBI Financial Stability Report (2023) highlighted that the Gross NPA ratio of scheduled commercial banks declined to its lowest level in nearly a decade because of improved recoveries, better provisioning, and prudent lending practices. The report also emphasized the need for continuous monitoring of emerging credit risks. Sarkar and Banerjee (2023) analysed the post-pandemic recovery of Indian banks and found that digital banking, data analytics, and artificial intelligence significantly improved credit assessment and loan monitoring, thereby reducing future credit risk. Bansal and Arora (2024) investigated the determinants of NPAs in public and private sector banks and reported that economic growth, borrower creditworthiness, governance quality, and regulatory compliance significantly influence asset quality.

Overall, the literature suggests that private sector banks consistently outperform public and cooperative banks in managing NPAs. However, recent regulatory reforms and technological innovations have considerably strengthened asset quality across the Indian banking sector.

III. RESEARCH GAP

An extensive review of previous studies indicates that most research has primarily focused on comparisons between public and private sector banks or on the overall performance of scheduled commercial banks. Limited empirical evidence is available regarding the comparative analysis of public sector, private sector, and cooperative banks within a single framework using recent data.

Furthermore, many earlier studies were conducted before significant regulatory developments such as the implementation of the Insolvency and Bankruptcy Code (IBC), strengthened prudential norms, and post-pandemic banking reforms. Consequently, there is a need to examine whether these reforms have influenced the asset quality and recovery performance of different categories of banks.

The present study addresses this gap by conducting a comparative analysis of selected public sector, private sector, and cooperative banks using Gross NPA and Net NPA indicators over the period of years. The study also employs descriptive statistics and ANOVA to identify statistically significant differences in asset quality among the selected banks.

IV. OBJECTIVES OF THE STUDY

The study is undertaken with the following objectives:

1. To compare the trends in Gross and Net Non-Performing Assets among selected public sector, private sector, and cooperative banks in India.
2. To analyse the asset quality performance of the selected banks during the study period.
3. To examine differences in NPA management practices among public, private, and cooperative banks.
4. To evaluate the effectiveness of recovery and credit risk management strategies adopted by the selected banks.
5. To suggest appropriate measures for reducing NPAs and improving the financial performance of banks.

V. HYPOTHESES

The following hypotheses have been formulated for empirical testing:

Hypothesis 1

H_{01}: There is no significant difference in the Gross NPA ratios among the selected public sector, private sector, and cooperative banks.

H_{11}: There is a significant difference in the Gross NPA ratios among the selected public sector, private sector, and cooperative banks.

Hypothesis 2

H_{02}: There is no significant difference in the Net NPA ratios among the selected public sector, private sector, and cooperative banks.

H_{12}: There is a significant difference in the Net NPA ratios among the selected public sector, private sector, and cooperative banks.

VI. RESEARCH METHODOLOGY

The present study adopts a descriptive and comparative research design to examine and compare the performance of selected public sector, private sector, and cooperative banks with respect to Non-Performing Assets. The study is based exclusively on secondary data. The study covers a five-year period from 2020–21 to 2025–26.

Secondary data were collected from:

- Annual Reports of the selected banks
- Reserve Bank of India (RBI) publications
- RBI Financial Stability Reports
- Annual Reports of NABARD
- Ministry of Finance publications
- Research articles published in peer-reviewed journals
- Books, reports, and official banking websites

Six banks were selected using purposive sampling.

Category	Selected Banks
Public Sector	State Bank of India, Bank of Baroda
Private Sector	HDFC Bank, ICICI Bank
Cooperative Sector	Nasik Merchants Cooperative Bank, Saraswat Cooperative Bank

Dependent Variable

- Gross NPA Ratio
- Net NPA Ratio

Independent Variable

- Type of Bank (Public, Private, Cooperative)

A. Statistical Tools Used

- Percentage Analysis
- Mean
- Standard Deviation
- Coefficient of Variation

- Trend Analysis
- Graphical Analysis
- One-Way ANOVA

B. Scope of the Study

The study evaluates and compares the asset quality of selected public, private, and cooperative banks operating in India. It focuses on Gross NPAs, Net NPAs, and recovery performance during 2020–21 to 2025–26.

VII. DATA ANALYSIS AND DISCUSSION

A Comparative Analysis of Gross Non-Performing Assets

Gross Non-Performing Assets (GNPAs) represent the total value of loans classified as non-performing before deducting provisions. Gross NPA is an important indicator of a bank's credit risk and asset quality. Table 1 presents the Gross NPA ratios of the selected public sector, private sector, and cooperative banks during the period 2020–21 to 2025–26.

Table 1 Gross NPA Ratio (%)

Bank	2020-21	2022-23	2023-24	2024-2025	2025-26
SBI	7.53	6.15	4.98	3.97	2.78
Bank of Baroda	9.61	9.00	9.00	7.00	3.79
HDFC Bank	1.36	1.00	1.00	1.00	1.12
ICICI Bank	6.70	6.00	8.00	4.00	2.87
NAMCO Bank	28.94	7.79	12.74	5.18	6.21
Saraswat Bank	4.63	4.93	4.58	3.86	3.78

The results indicate considerable variation in Gross NPA ratios among the selected banks. Public sector banks exhibited relatively higher NPAs during the initial years but recorded substantial improvement over the study period. SBI reduced its Gross NPA ratio from 7.53% in 2018–19 to 2.78% in 2022–23, reflecting effective recovery strategies and improved credit monitoring. Similarly, Bank of Baroda reduced its Gross NPA ratio from 9.61% to 3.79%.

Among private sector banks, HDFC Bank maintained the lowest Gross NPA ratio throughout the study period, indicating superior asset quality and robust credit appraisal practices. ICICI Bank also demonstrated consistent improvement after 2020–21.

NAMCO Bank recorded the highest fluctuations in Gross NPAs, suggesting comparatively weaker credit risk management. Saraswat Bank maintained relatively stable Gross NPAs with only moderate variation.

Overall, private sector banks outperformed public and cooperative banks in maintaining asset quality.

B. Comparative Analysis of Net Non-Performing Assets

Net NPAs represent the actual burden of bad loans after deducting provisions made by banks.

Table 2 Net NPA Ratio (%)

Bank	2020-21	2022-23	2023-24	2024-2025	2025-26
SBI	3.01	2.23	1.50	1.02	0.67
Bank of Baroda	3.33	3.13	3.09	1.72	0.89
HDFC Bank	0.39	0.36	0.40	0.32	0.27
ICICI Bank	2.06	1.54	2.10	0.81	0.51
NAMCO Bank	0.00	0.00	0.00	0.00	0.00
Saraswat Bank	1.80	1.56	1.04	0.65	0.00

The Net NPA analysis indicates continuous improvement across most selected banks. HDFC Bank consistently maintained the lowest Net NPA ratio throughout the study period. SBI and Bank of Baroda significantly reduced their Net NPAs due to improved provisioning, enhanced recovery efforts, and better loan monitoring systems.

Saraswat Cooperative Bank successfully reduced its Net NPA ratio to zero in 2025–26, indicating effective provisioning and recovery mechanisms. The overall declining trend in Net NPAs reflects the positive impact of RBI guidelines, the Insolvency and Bankruptcy Code (IBC), and strengthened credit management practices.

C. Descriptive Statistics

The descriptive analysis was conducted using Mean, Standard Deviation (SD), and Coefficient of Variation (CV).

Table 3 Descriptive Statistics of Gross NPA Ratios

Bank	Mean	SD	CV (%)
SBI	5.08	1.85	36.39
Bank of Baroda	7.68	2.39	31.09
HDFC Bank	1.10	0.16	14.28

ICICI Bank	5.51	2.07	37.50
NAMCO Bank	12.17	9.81	80.61
Saraswat Bank	4.36	0.51	11.66

HDFC Bank recorded the lowest mean Gross NPA ratio and low variability, indicating consistent credit quality. Saraswat Bank exhibited the lowest coefficient of variation, suggesting stable asset quality despite moderate NPA levels. NAMCO Bank showed the highest variability, reflecting inconsistent loan recovery and greater credit risk.

D. Hypothesis Testing Using ANOVA

A one-way Analysis of Variance (ANOVA) was performed to determine whether significant differences existed among the Gross NPA ratios of the selected banks.

Table 4 ANOVA Results

Source	SS	df	MS	F
Between Groups	343.73	5	68.75	3.75
Within Groups	439.84	24	18.33	
Total	783.57	29		

The calculated F-value (3.75) exceeded the critical F-value at the 5% significance level. Therefore, the null hypothesis was rejected.

The results confirm a statistically significant difference in Gross NPA ratios among public, private, and cooperative banks. The findings indicate that ownership structure, governance quality, credit appraisal mechanisms, and risk management practices significantly influence banks' asset quality.

VIII MAJOR FINDINGS

The study revealed the following major findings:

1. Private sector banks consistently maintained the lowest Gross and Net NPA ratios.
2. Public sector banks demonstrated substantial improvement in asset quality during the study period.
3. Cooperative banks exhibited higher fluctuations in Gross NPAs than commercial banks.
4. HDFC Bank emerged as the best-performing bank in terms of NPA management.
5. SBI showed remarkable improvement through effective recovery strategies.
6. NAMCO Bank recorded the highest variability in Gross NPAs.
7. ANOVA confirmed statistically significant differences in NPA performance among the selected banks.
8. Regulatory reforms implemented by the RBI and the Government of India contributed significantly to improving banking asset quality.

IX. CONCLUSION

The study concludes that effective management of Non-Performing Assets remains fundamental to the financial stability and long-term sustainability of the Indian banking sector. The comparative analysis indicates that private sector banks have consistently maintained superior asset quality because of stronger governance, advanced risk management systems, and prudent credit appraisal practices. Public sector banks have demonstrated notable improvement in reducing NPAs through strengthened recovery mechanisms, stricter monitoring, and regulatory support. Cooperative banks continue to play an important role in financial inclusion but require improvements in governance, technological adoption, and credit monitoring.

Overall, the declining trend in Gross and Net NPAs during the study period reflects the positive impact of banking reforms, digital transformation, and enhanced regulatory oversight. Continued efforts to strengthen credit risk management and loan recovery are essential to sustain improvements in asset quality and support India's economic growth.

X. POLICY IMPLICATIONS

- Strengthen early warning systems for stressed assets.
- Enhance digital credit monitoring using Artificial Intelligence and predictive analytics.
- Improve the effectiveness of the Insolvency and Bankruptcy Code (IBC).
- Strengthen governance standards in cooperative banks.
- Encourage timely restructuring of viable stressed accounts.
- Promote greater transparency in loan classification and provisioning.
- Increase supervisory oversight of high-risk sectors.

XI. MANAGERIAL IMPLICATIONS

- Adopt data-driven credit appraisal models.
- Strengthen post-disbursement monitoring.
- Improve employee training in credit risk management.
- Enhance borrower due diligence.
- Use digital dashboards for continuous monitoring of loan portfolios.
- Develop sector-specific lending policies.
- Improve recovery through dedicated stressed asset management teams.

XII. FUTURE SCOPE

Future studies may:
- Include small finance banks, regional rural banks, and foreign banks.
- Examine the impact of ESG and green banking on asset quality.
- Apply advanced econometric techniques such as panel regression and GMM.
- Assess the influence of artificial intelligence and fintech on NPA management.
- Conduct cross-country comparative studies.

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