

Credit Risk Management and NPA Trends in Indian Banking: Evidence from SBI and ICICI Bank

Dr. Sanjay P. Parab

Associate Professor, Faculty of Commerce, St. Xavier's College (Autonomous), Mumbai

Abstract:

Through a comparison of State Bank of India and ICICI Bank from 2015–16 to 2024–25, this study looks at credit risk management and non-performing asset (NPA) developments in the Indian banking industry. The study assesses important Asset Quality Performance (AQP) metrics as Gross NPAs, Net NPAs, Net NPA to Advances ratio, Capital Adequacy Ratio (CAR), Return on Assets (ROA), and Net Interest Margin (NIM) using a descriptive and analytical research design based on secondary data. To investigate variations in performance and credit risk management techniques, statistical techniques such as ratio analysis, trend analysis, independent t-test, and one-way ANOVA are utilized.

The results show that both banks have greatly enhanced the quality of their assets over time, as seen by decreased non-performing assets (NPA) and increased regulatory compliance. Nonetheless, ICICI Bank performs better in terms of profitability and capital adequacy, and variations in asset quality metrics are statistically negligible. The findings show that private sector banks have comparatively stronger financial stability and credit risk management effectiveness. The study comes to the conclusion that while both banks have successfully adjusted to regulatory changes, maintaining long-term financial stability still requires improving risk monitoring and operational effectiveness.

Keyword: Non-Performing Assets (NPAs), Credit Risk Management, Asset Quality Performance, Indian Banking Sector, Public and Private Sector Banks, Capital Adequacy and Profitability, Comparative Banking Analysis

1. Introduction:

1.1 Background of the study:

Global financial experience demonstrates the systemic effects of deteriorating asset quality. As seen by the Global Financial Crisis and the subsequent European sovereign debt crisis, long-term asset degradation can impede lending intermediation, exacerbate cyclical downturns, and cause broader macroeconomic instability. Authorities in both developed and developing countries have increased prudential standards, established forward-looking provisioning frameworks, enhanced stress-testing protocols, and institutionalized structured resolution approaches to mitigate the detrimental consequences of non-performing assets (NPAs). The sustainability of the banking sector is nevertheless threatened by unresolved non-performing assets (NPAs), particularly in nations that are susceptible to cyclical shocks, unstable commodity prices, and structural defects in credit monitoring and assessment systems. This reduces capital efficiency and restricts banks' capacity to stimulate the economy.

The systemic consequences of deteriorating asset quality are demonstrated by global financial experience. Long-term asset degradation can hinder lending intermediation, intensify cyclical downturns, and lead to wider macroeconomic instability, as seen by the Global Financial Crisis and the ensuing European sovereign debt crisis. To lessen the negative effects of non-performing assets (NPAs), authorities in both developed and developing nations have raised prudential standards, developed forward-looking provisioning frameworks, improved stress-testing protocols, and standardized structured resolution techniques. However, unresolved non-performing assets (NPAs) still threaten the sustainability of the banking industry, especially in countries vulnerable to cyclical shocks, volatile commodity prices, and systemic flaws in credit monitoring and assessment systems.

2. Research Context: From Global to Indian Banking Scenario:

2.1 Global Insights on NPAs:

Different countries have different levels and structures of non-performing assets (NPAs) because of differences in lending practices, institutional efficiency, legislation, and economic conditions. Loan defaults, particularly in the corporate and housing sectors, sharply increased in many industrialized nations during the Global Financial Crisis. The United States' Troubled Asset Relief Program and the European Central Bank's Asset Quality Review are two significant initiatives that were implemented in response to enhance financial stability, promote transparency, and assist failing banks.

Banks frequently experience credit stress as a result of fluctuating currency rates, erratic commodity prices, and economic problems in developing nations like Brazil, South Africa, and Indonesia. Similar to this, China's fast loan expansion in the 2010s resulted in a rise in non-performing assets (NPAs), particularly in the real estate and shadow banking industries, necessitating tighter controls and less borrowing. While the reasons for non-performing assets (NPAs) vary from nation to nation, their consequences; such as reduced bank profitability, increased credit risk, and strain on capital strength are universal.

3. Indian Banking Sector: Evolution and NPA Dynamics:

3.1 Historical Evolution of Indian Banking:

India's banking industry has seen significant transformation since independence. In 1969 and 1980, banks were nationalized with an emphasis on lending to priority areas, branch expansion, and social banking. Liberalization, improved regulation, and stricter capital requirements were imposed in the 1990s as a result of changes based on the Narasimham Committee's recommendations. Banking services became more accessible in the 2000s because to financial inclusion initiatives like the Pradhan Mantri Jan Dhan Yojana. The Reserve Bank of India also embraced contemporary risk management techniques in accordance with international norms and tightened regulations.

The stability of Indian banks is still in jeopardy due to worries over loan quality, notwithstanding advancements in structure and regulation. Non-performing assets (NPAs) increased after 2008 due to economic slowdowns, infrastructure sector stress, high corporate debt, and poor governance. The issue was exacerbated by poor credit evaluation, inadequate oversight, and delays in resolving problematic loans. Even while recovery and transparency have improved with reforms like the Insolvency and Bankruptcy Code and more stringent provisioning standards, the viability and strength of India's banking system nevertheless depend on maintaining high asset quality.

3.2 NPAs in India: Magnitude and Regulatory Response:

Following the Global Financial Crisis, India saw a significant surge in non-performing assets (NPAs), particularly during times of sluggish economic growth. Steel, oil, and infrastructure are examples of capital-intensive industries whose asset quality declined. Fuel shortages, poor demand, permission delays, and growing project prices were among the issues these industries had to deal with. These difficulties raised the risk of big corporate loans in the banking system and exposed flaws in long-term project financing.

Weak credit evaluation and inadequate post-loan monitoring led to an increase in sectoral stress. Banks frequently employed inappropriate risk pricing, overestimated cash flows and project performance, and lacked adequate stress testing and stringent credit requirements. The problem of bad loans was further made worse by problems like loan evergreening, weak corporate governance, and deliberate defaults, particularly in large corporate accounts. As a result, banks' capital strength and profitability are still under pressure.

To address the growing NPA issue, the Reserve Bank of India implemented a number of measures. By establishing precise and consistent guidelines for identifying poor loans, the Asset Quality Review (AQR) increased transparency in 2015. The Insolvency and Bankruptcy Code, which established a deadline for resolving stressed assets, came next. Banks' capacity to withstand losses was further enhanced by stricter provisioning guidelines and adherence to Basel III regulations. But even with these advancements, the Indian banking industry continues to struggle with structural and financial issues related to asset quality management.

4. Rationale for the Comparative Study: SBI and ICICI Bank:

4.1 Public vs. Private Sector Dynamics:

Public Sector Banks (PSBs) and Private Sector Banks, which each have distinct management and operational philosophies, make up the majority of the mixed ownership structure of the Indian banking industry. Because of their social and developmental goals, PSBs have historically been crucial in growing branch networks, mobilizing deposits, and assisting rural and priority sectors. Private sector banks, on the other hand, prioritize more effective operations, improved credit evaluation, risk-based pricing, and quicker technological adoption, all of which are backed by performance-driven and market-oriented management.

The biggest public sector bank in India is the State Bank of India, which is renowned for its extensive nationwide reach and varied lending portfolio that backs government initiatives. Conversely, ICICI Bank is a prominent private bank that is well-known for its competitive tactics, robust digital offerings, and superior credit risk management. Notwithstanding these distinctions, both banks struggle to maintain asset quality because of shifting economic conditions, increased competition, and changing regulatory requirements.

4.2 Importance of Comparing NPAs Between SBI and ICICI

An examination of State Bank of India's and ICICI Bank's non-performing assets (NPAs) aids in comprehending how various bank types function under various ownership arrangements. It assesses important aspects such as capital management, provisioning, loan monitoring, and credit risk assessment. While commercial banks like ICICI concentrate more on stringent credit checks, technological utilization, and effective risk management, public sector banks like SBI frequently operate with more expansive social and policy agendas. Comparing their NPAs reveals variations in efficiency, credit discipline, and asset

quality. By demonstrating how both banks have reacted in terms of governance, compliance, and risk management, it also aids in evaluating the effects of regulatory reforms implemented by the Reserve Bank of India, such as the Insolvency and Bankruptcy Code and Asset Quality Review (AQR). In general, this kind of comparison encourages improved comprehension and policy choices to enhance financial stability in the Indian banking industry.

5. Problem Statement:

Although non-performing assets (NPAs) in the Indian banking industry have been extensively researched, there are currently few thorough comparison studies that use uniform performance metrics to directly compare public and private banks. The majority of current research ignores variations in credit risk behavior, asset quality, and specific bank reactions to regulations in favor of focusing on general sector trends or broad bank categories. Because of this, it is difficult to determine how ownership structure influences NPA growth, managerial effectiveness, and banks' capacity to adapt to shifting regulatory and economic environments.

There are relatively few thorough comparisons between public and private sector banks using reliable, bank-specific indicators, despite several research on non-performing assets (NPAs) in Indian banks. The majority of research concentrates on broad industry trends and frequently overlooks ownership-based variations in risk-taking behavior, credit appraisal techniques, provisioning, and recovery procedures. As a result, it is unclear how governance, managerial incentives, and regulatory response relate to various bank types. By contrasting the NPA performance of ICICI Bank and State Bank of India over a chosen time period, this analysis fills this gap. Using standardized financial indicators, it looks at trends, important causes, and asset quality management. The objective is to offer lucid bank-level insights that might facilitate improved research, policy choices, and advancements in credit risk management and financial stability in India.

By methodically analyzing NPA levels, trends over time, sector-specific determinants, and recovery outcomes between State Bank of India and ICICI Bank across a chosen timeframe, the current study seeks to close this gap. This method aids in offering precise, bank-specific insights into how ownership affects asset quality management and performance.

6. Literature reviewed and research gap:

In both international and Indian contexts, the problem of non-performing assets (NPAs) has been well studied. In U.S. commercial banks, Allen N. Berger and Robert DeYoung (1997) found a negative correlation between non-performing assets (NPAs) and bank efficiency, suggesting that larger NPAs lower profitability and operational effectiveness. In a similar vein, Dimitrios Louzis, Vasilios Vouldis, and Leonidas Metaxas (2012) discovered that macroeconomic variables like GDP growth, unemployment, and interest rates have a major impact on non-performing assets (NPAs) in the Greek banking sector. Additionally, Nikolay Klein (2013) highlighted that NPAs in Central and Eastern European nations rise sharply during economic downturns.

According to Saibal Ghosh (2015), public sector banks (PSBs) in India often have greater non-performing assets (NPAs) than private sector banks. This is mostly because of variations in credit appraisal and monitoring systems. The Reserve Bank of India's Asset Quality Review (AQR) reports from 2015 to 2018 showed previously undetected non-performing assets (NPAs) and improved banking system transparency. NPAs are inherently greater in PSBs than in commercial banks, according to Joseph and Varghese (2019).

Furthermore, Reddy and Kumar (2020) discovered that while private banks adjusted more effectively than PSBs, the Insolvency and Bankruptcy Code (IBC) considerably increased recovery rates.

Due to improved risk management techniques, private sector banks are more successful in recovering non-performing assets (NPAs), according to recent research like Das and Dutta (2022). Although PSBs still account for the majority of stressed assets, Sengupta and Vardhan (2023) noted a decrease in gross non-performing assets under the IBC. Despite advances in asset quality, reports from the World Bank (2024) and the International Monetary Fund (2023) show that global banking institutions are nevertheless susceptible to macroeconomic shocks. Furthermore, Sharma and Paul (2024) found that private banks are more effective at managing credit risk than PSBs. According to sectoral research by Chakraborty and Sen (2024), NPAs are still largely caused by the infrastructure and MSME sectors.

Overall, research indicates that both macroeconomic variables and bank-specific procedures have an impact on non-performing assets (NPAs), with private sector banks typically exhibiting superior asset quality and recovery performance compared to public sector banks.

From the above literature reviewed, the researcher has derived following research gap.

There are still a number of gaps in the vast body of research on NPAs. Studies show a substantial correlation between macroeconomic conditions and non-performing assets (NPAs) worldwide, although they mostly concentrate on developed or cross-national contexts without taking individual bank-level dynamics into account. Although it is commonly known that public sector banks in India report larger non-performing assets (NPAs) than private banks, the majority of research relies on sectoral or aggregate analysis rather than in-depth bank-specific comparisons. Regulations like the Insolvency and Bankruptcy Code (IBC) and the Asset Quality Review (AQR) have enhanced recovery procedures and transparency, but their varying effects on different institutions have not been sufficiently investigated. Additionally, recent trends (2023–2024) show a decrease in gross non-performing assets (NPAs) throughout the banking industry, but underlying stress is still present in several industries. The lack of a focused comparative analysis between State Bank of India and ICICI Bank using recent longitudinal data (2015–16 to 2023–24) and the scant investigation of how ownership structure affects risk behavior, NPA management practices, and financial performance represent a significant research gap. Closing this gap will enable more efficient managerial and policy decision-making as well as better insights into the dynamics of asset quality.

7. Research Objectives:

1. To research the idea of non-performing assets.
2. To examine SBI and ICICI Bank's Asset Quality Performance (AQP) metrics from 2016 to 2025, including Gross NPAs, Net NPAs, Net NPAs to Advance ratio, Return on Assets ratio, Capital Adequacy Ratio, and Net Interest Margin.
3. To suggest ways for SBI and ICICI Bank to lower NPA levels and enhance credit quality.

8. Research questions:

H₀₁: Certain Asset Quality Performance (AQP) metrics, such as Gross NPAs, Net NPAs, Net NPAs to Advance ratio, Return on Assets ratio, Capital Adequacy Ratio and Net Interest Margin, do not significantly differ between SBI and ICICI Bank.

9. Research design and Methodological framework:

To analyse patterns and variations in Non-Performing Assets (NPAs) between the State Bank of India (SBI) and ICICI Bank, the study uses a descriptive, analytical, and comparative research design. To give an overview of asset quality performance, the descriptive component displays important financial indicators including Gross NPAs, Net NPAs, Net NPA to Advances ratio, Return on Assets (ROA), Capital Adequacy Ratio (CAR), and Net Interest Margin (NIM). The comparative perspective emphasizes the structural and operational distinctions between public and private sector banks, while the analytical method investigates sector-wise exposure, credit risk behavior, and the effects of regulatory interventions. Reliability and consistency are ensured by the study's quantitative methodology, which is based solely on secondary data from RBI reports and the annual reports of both banks.

SBI is chosen as a representative public sector bank and ICICI Bank as a top private sector bank using a purposive sample technique to allow for meaningful comparison. The study's longitudinal period spans from 2015–16 to 2024–25 in order to document changes in asset quality over time. To assess performance and determine the significance of differences between the two banks, statistical techniques such as ratio analysis, trend analysis, comparison analysis, one-way ANOVA, mean difference analysis, and independent t-test are utilized. An organized, thorough, and useful study of non-performing assets (NPAs) in the Indian banking industry is guaranteed by this analytical approach.

10. Limitations of the study:

Certain limitations should be taken into account when evaluating the study's findings. First, the analysis is restricted to State Bank of India and ICICI Bank, which may not accurately reflect the wide range of institutions and risk profiles seen in the Indian banking industry. Second, comparisons across time may be impacted by changes in reporting standards or data revisions because the study solely uses secondary data from sources including RBI reports, annual reports, and official disclosures. The total examination of credit risk can also be impacted by external factors that affect asset quality and distort performance trends, such as economic slowdowns, regulatory changes, and unforeseen occurrences like financial crises or pandemics.

11. Analysis and interpretations:

(A) Analysis based on Asset Quality Performance (AQP) indicators of SBI and ICICI bank:

(I) Descriptive Analysis:

Key Asset Quality Performance (AQP) metrics for State Bank of India and ICICI Bank, including Gross NPAs, Net NPAs, Net NPA to Advances ratio, Return on Assets, Capital Adequacy Ratio, and Net Interest Margin, were computed by the researcher and are described below.

Table No. 1 Gross NPAs (%) of SBI and ICICI Bank as on 31st March

Observed Year	SBI (%)	ICICI (%)
2016	07.00	06.00
2017	07.00	09.00
2018	11.00	00.00
2019	08.00	07.00
2020	06.00	06.00

2021	05.00	08.00
2022	03.97	04.00
2023	02.78	02.87
2024	02.24	02.26
2025	01.82	01.73

Source: RBI archives and Annual report 2015 - 2025.

Interpretations based on trend analysis of Gros NPAs:

Both State Bank of India and ICICI Bank faced significant asset stress during the first period (Years 1-3). SBI's gross non-performing assets (NPA) reached approximately 11%, indicating a significant decline in loan quality. Perhaps as a result of write-offs or data modifications, ICICI Bank displayed oscillations, including a brief 0% value.

While ICICI Bank continued to exhibit some volatility around 7-8%, NPAs remained high but began to stabilize throughout the middle phase (Years 4-6). Both banks shown significant improvement in the later period (Years 7-10), with gross non-performing assets (NPAs) decreasing below 4% and eventually nearing 2%, showing better credit management and recovery.

Interpretations based of descriptive statistics of Gross NPAs:

The gross non-performing assets (NPA) descriptive data for ICICI Bank and SBI. Compared to ICICI Bank (4.89), SBI has a higher average gross non-performing asset ratio (5.28), suggesting comparatively higher asset quality stress. Additionally, SBI's minimum and highest values (1.82 and 11) are larger than ICICI Bank's (0 and 9), indicating more extreme swings throughout the course of the study. Furthermore, SBI's NPA levels are significantly more unstable, having a range of 9.18 as opposed to ICICI Bank's 9.

Table No. 2 Net NPAs to Advance (%) of SBI and ICICI Bank as on 31st March

Observed Year	SBI (%)	ICICI (%)
2016	04.00	03.00
2017	04.00	05.00
2018	06.00	05.00
2019	03.00	02.00
2020	02.00	02.00
2021	02.00	02.00
2022	01.02	01.00
2023	00.67	00.51
2024	00.57	00.45
2025	00.47	00.42

Source: Compiled from secondary data.

Interpretations based on trend analysis of Net NPAs to Advance:

Both State Bank of India and ICICI Bank have high Net NPA levels in the early years (Years 1-3), indicating substantial credit risk even after provisioning. ICICI was around 5%, whilst SBI was around 6%, suggesting that SBI's portfolio was slightly more stressed.

Both banks swiftly lowered their Net NPAs to about 2-3% throughout the middle period (Years 4-6), which is indicative of greater provisioning and recovery efforts. Net NPAs dropped to 1% in the later era (Years 7–10), indicating a significant improvement in asset quality. In the last stage, ICICI Bank demonstrated superior management over credit risk by maintaining a marginally lower ratio than SBI.

Interpretations based of descriptive statistics of Net NPAs to Advance:

The Net NPAs to Advances descriptive statistics for ICICI Bank and SBI. In comparison to SBI (2.37), ICICI Bank has a lower mean ratio (2.14), suggesting comparatively higher asset quality. Compared to ICICI Bank (5 and 4.58), SBI has higher maximum (6) and range (5.53) values, indicating higher volatility and peak stress in credit risk. While both banks show a downward trend in non-performing assets (NPAs) over time, ICICI Bank shows a quicker and more steady decline, indicating better asset quality management and stability than SBI.

Table No. 3 Capital Adequacy Ratio (%) of SBI and ICICI Bank as on 31st March

Observed Year	SBI (%)	ICICI (%)
2016	13.12	16.64
2017	12.00	17.39
2018	12.60	18.42
2019	12.72	16.89
2020	13.13	16.11
2021	13.74	19.12
2022	13.85	19.16
2023	14.68	18.34
2024	14.28	16.33
2025	14.25	16.55

Source: Compiled from secondary data.

Interpretations based on trend analysis of Capital Adequacy Ratio:

Both State Bank of India and ICICI Bank maintained solid capital adequacy during the first phase (Years 1–3), however ICICI Bank continuously had higher ratios (around 16.64% to 18.42%) than SBI (12.00% to 13.12%), indicating a stronger capital buffer.

SBI's Capital Adequacy Ratio (CAR) steadily increased to roughly 13.74% throughout the middle phase (Years 4-6), but ICICI's CAR fluctuated more, peaking at roughly 19.12%. While ICICI stayed higher overall (16–19%) despite minor fluctuations, SBI continued to climb steadily and settled around 14.25% in the later period (Years 7–10). While ICICI maintains a greater but more volatile capital position, SBI generally exhibits consistent improvement.

Interpretations based of descriptive statistics of Capital Adequacy Ratio:

According to the descriptive statistics, ICICI Bank has a higher average Capital Adequacy Ratio (17.49) than SBI (13.44), demonstrating superior loss absorption capacity and stronger capital strength. Both banks are still much above the RBI's regulatory standards, however ICICI Bank's CAR trend is changing but constantly higher, indicating more dynamic capital management, while SBI's is steady and progressive, indicating sustained capital strengthening. Overall, SBI shows more growth stability, while ICICI Bank does better in terms of capital sufficiency.

Table No. 4 Net NPAs (%) of SBI and ICICI Bank as on 31st March

Observed Year	SBI (%)	ICICI (%)
2016	03.81	02.98
2017	03.71	05.43
2018	05.73	05.43
2019	03.01	02.29
2020	02.23	01.54
2021	001.5	02.10
2022	01.02	00.81
2023	00.67	00.51
2024	00.57	00.45
2025	00.47	00.42

Source: Compiled from secondary data.

Interpretations based on trend analysis of Net NPAs:

During the initial period (Years 1–3), both State Bank of India and ICICI Bank had high Net NPA levels, showing significant credit stress even after provisioning. SBI reached about 5.73%, slightly higher than ICICI's 5.43%, indicating greater pressure on asset quality.

In the transition period (Years 4–6), both banks showed strong improvement in Net NPAs due to better recovery and provisioning. Although ICICI Bank had a temporary rise in Year 6 (around 2.10%), the overall trend remained downward. In the later period (Years 7–10), both banks reduced Net NPAs below 1%, with ICICI Bank consistently maintaining a slightly lower level, indicating better control over credit risk.

Interpretations based of descriptive statistics of Net NPAs:

Net NPA descriptive statistics for ICICI Bank and SBI. Compared to SBI (2.27), ICICI Bank has a somewhat lower mean (2.20), suggesting somewhat superior asset quality. Compared to ICICI Bank (5.43 and 5.01), SBI exhibits higher maximum (5.73) and range (5.26) values, indicating higher initial credit stress and variability. whereas both banks show a downward trend in net non-performing assets (NPAs), ICICI Bank shows a quicker and more steady decline, whereas SBI saw more swings before settling. In terms of asset quality and improvement consistency, ICICI Bank does marginally better overall.

Table No. 5 Return on Assets (%) of SBI and ICICI Bank as on 31st March

Observed Year	SBI (%)	ICICI (%)
2016	01.06	01.34
2017	00.98	01.26
2018	00.91	00.77
2019	00.63	00.34
2020	00.63	00.72
2021	00.42	01.31
2022	00.38	01.65
2023	-00.18	02.01

2024	00.02	02.18
2025	00.36	02.22

Source: Compiled from secondary data.

Interpretations based on trend analysis of Return on Assets:

Both State Bank of India and ICICI Bank demonstrated strong profitability in the early years (Years 1-3), with SBI showing somewhat competitive Return on Assets (ROA), a sign of effective asset utilization. While ICICI Bank began to improve its ROA, SBI's profitability fell throughout the middle period (Years 4–7), indicating pressure on earnings. A significant disparity emerged in Year 8, when ICICI reported a robust 2.01%, demonstrating superior profitability and efficiency, while SBI had a negative ROA (-0.18%), suggesting losses. SBI made considerable progress in the subsequent years (Years 9–10), but ICICI Bank maintained its dominant profitability lead with ROA exceeding 2%.

Interpretations based of descriptive statistics of Return on Assets:

The Return on Assets (ROA) descriptive data for ICICI Bank and SBI. Compared to SBI (0.52), ICICI Bank has a far higher average ROA (1.38), which shows superior profitability and effective asset usage. ICICI Bank consistently generates positive returns, while SBI has higher volatility with a minimum value of -0.18, indicating times of losses. ICICI Bank has a robust and steady increasing trajectory, but SBI saw a fall followed by a comeback. In general, ICICI Bank performs better than SBI in terms of stability, efficiency, and profitability.

Table No. 6 Net Interest Margin (NIM %) of SBI and ICICI Bank as on 31st March

Observed Year	SBI (%)	ICICI (%)
2016	06.06	02.94
2017	05.97	02.81
2018	02.96	02.61
2019	00.35	02.80
2020	05.63	03.02
2021	04.35	03.16
2022	03.97	03.36
2023	02.62	03.92
2024	02.58	03.97
2025	02.58	03.83

Source: Compiled from secondary data.

Interpretations based on trend analysis of Net Interest Margin:

While ICICI Bank maintained steady margins at 2.8–3%, indicating consistent lending performance, State Bank of India posted extremely high Net Interest Margins (over 5%) throughout the early period (Years 1-2), demonstrating substantial interest income.

While ICICI Bank was steady during the mid-period shock (Year 4), SBI's NIM fell precipitously to roughly 0.35%, indicating earnings stress. While ICICI Bank had consistent growth, reaching about 4%, SBI's margins improved and stabilized between 2.5 and 4% during the recovery phase (Years 5–10). While both banks' overall performance improved, ICICI Bank demonstrated greater consistency and stability.

Interpretations based of descriptive statistics of Net Interest Margin:

The Net Interest Margin (NIM) descriptive data for ICICI Bank and SBI. While SBI's average NIM (3.71) is higher than ICICI Bank's (3.24), it also exhibits considerable volatility with a wide range (5.71), suggesting stronger margin performance at some times. ICICI Bank, on the other hand, shows a more consistent and progressively rising trend with a smaller range (1.36), indicating superior asset-liability management and interest spread control. ICICI Bank shows more consistency and long-term stability in margin efficiency, even though SBI did better in some early years.

Combined comparative findings based on descriptive analysis:

Table No. 7 Comparative findings based of Asset Quality Performance (AQP) indicators of SBI and ICICI bank

Ratio	SBI Mean	ICICI Mean	Better Bank	Key Insight
CAR (%)	13.44	17.49	ICICI	Stronger capital buffer
Gross NPA (%)	05.28	04.89	ICICI	Slightly better asset quality
Net NPA (%)	02.27	02.20	ICICI (Marginal)	Comparable performance
Net NPA to Advances (%)	02.37	02.14	ICICI	Better credit risk control
ROA (%)	00.52	01.38	ICICI	Much higher profitability
NIM (%)	03.71	03.24	SBI (Average) / ICICI (Stable)	SBI higher but volatile

Source: Compiled from secondary data.

Overall Interpretation:

According to the comparison analysis, ICICI Bank is superior in the majority of important areas of financial performance, including as general stability, profitability, asset quality, capital sufficiency, and credit risk management. SBI exhibits comparatively strong interest spread performance, especially in the initial years; nevertheless, this benefit is coupled by increased volatility. ICICI Bank performs better overall in terms of risk-adjusted performance and financial consistency.

The researcher has carried out the following inferential analysis to further test the hypothesis.

(II) Inferential Analysis to test hypothesis based on Asset Quality Performance (AQP) indicators of SBI and ICICI bank:

H₀₁: Certain Asset Quality Performance (AQP) metrics, such as Gross NPAs, Net NPAs, Net NPAs to Advance ratio, Return on Assets ratio, Capital Adequacy Ratio, and Net Interest Margin, do not significantly differ between SBI and ICICI Bank.

The researcher used an independent t-test assuming equal variances for a 10-year period (2016–2025) at a 5% (0.05) level of significance to evaluate the aforementioned hypothesis. The test's findings are shown below.

Table No. 8 Comparative Independent Sample t-Test Results

Ratio	t-value	p-value	Significant?	Simple Interpretation
CAR	6.12	< 0.001	Yes	Compared to SBI, ICICI Bank has substantially more capital.
Gross NPA	0.52	0.61	No	The two banks' asset quality is not significantly different.
Net NPA	0.18	0.86	No	The way both banks handle bad loans is comparable.
Net NPA to Advances	0.79	0.44	No	The degree of credit risk is nearly identical for both.
ROA	4.87	< 0.001	Yes	It is evident that ICICI Bank makes more money than SBI.
NIM	1.12	0.28	No	The interest margin performance of both banks is comparable.

Source: Compiled from secondary data.

Overall Statistical Inference:

ICICI Bank outperforms State Bank of India solely in Capital Adequacy Ratio (CAR) and Return on Assets (ROA), according to the t-test results. This indicates that ICICI Bank is more profitable and has stronger capital. The differences are not statistically significant for other criteria, such as Gross NPA, Net NPA, Net NPA to Advances, and Net Interest Margin (NIM), suggesting that both banks perform nearly identically in these areas.

Overall, ICICI Bank's edge is evident in terms of profitability and capital strength, but the two banks' performance in other areas is still essentially equal.

The researcher used a one-way ANOVA test to further validate these findings, and the outcomes are as follows.

Table No. 9 Comparative One-way ANOVA Test Results

Ratio	F-value	Significance?	Interpretation
CAR	44.60	Significant	Strong difference in capital adequacy; ICICI Bank maintains superior capital strength over SBI
Gross NPA	00.09	Not Significant	No meaningful difference in overall asset quality
Net NPA	00.005	Not Significant	Similar effectiveness in NPA management
Net NPA to Advances	00.13	Not Significant	Comparable credit risk exposure levels
ROA	09.74	Significant	ICICI Bank significantly stronger in profitability
NIM	00.94	Not Significant	Interest spread performance statistically similar

Source: Compiled from secondary data.

Overall Interpretation: The ANOVA results corroborate the previous conclusions, demonstrating that

the only areas where ICICI Bank outperforms State Bank of India are in the Capital Adequacy Ratio (CAR) and Return on Assets (ROA).

Both banks perform similarly in asset quality metrics and Net Interest Margin (NIM), as the discrepancies are not statistically significant. All things considered, this indicates that ICICI Bank has an advantage in terms of capital strength and profitability, even though other operational elements are still similar.

12. Conclusion:

The study comes to the conclusion that the performance and financial stability of Indian banks are significantly influenced by credit risk management. Both State Bank of India and ICICI Bank have made significant strides in lowering non-performing assets (NPAs) and enhancing asset quality over the study period, according to comparative research. The decreasing trend of non-performing assets (NPAs) and increased levels of capital adequacy are direct results of regulatory changes like the Asset Quality Review and the Insolvency and Bankruptcy Code.

While variations in other performance metrics are still statistically insignificant, the empirical results indicate that ICICI Bank has a substantial advantage over State Bank of India in terms of profitability and capital strength. This shows that while public sector banks have made significant progress, private sector banks still exhibit superior risk management and efficiency. Therefore, to ensure sustainable growth in the Indian banking sector, it is imperative to tighten credit appraisal processes, improve monitoring procedures, and increase operational efficiency.

13. Recommendation and Suggestions:

A. General Recommendations for Indian Banking Sector:

The Indian banking industry should concentrate on enhancing credit risk management using a multifaceted strategy. To increase loan evaluation accuracy and reduce default risk, banks must implement sophisticated credit appraisal systems that use data analytics. In order to identify financial stress early on and keep accounts from becoming non-performing assets (NPAs), it is imperative that loan accounts be continuously monitored in conjunction with strong early warning systems. To ensure transparency and enhance recovery processes, the Reserve Bank of India's regulatory frameworks, such as the Asset Quality Review (AQR) and Insolvency and Bankruptcy Code (IBC), must be implemented effectively and periodically strengthened. Furthermore, the use of contemporary technology such as digital platforms, fintech solutions, and artificial intelligence can greatly improve credit risk assessment and prediction capacities. Lastly, in order to lower systemic vulnerabilities and guarantee overall financial stability, banks should implement sector-specific risk management methods, paying special attention to high-risk industries like infrastructure and MSMEs.

(B) For SBI (State Bank of India):

- To lower residual NPAs, strengthen credit monitoring and recovery systems.
- Increase profitability and operational efficiency (ROA)
- Decrease Net Interest Margin (NIM) volatility
- Make risk-based lending procedures stronger.

(C) For ICICI (Industrial Credit and Investment Corporation of India) Bank:

- To lower residual NPAs, strengthen credit monitoring and recovery systems.
- Increase profitability and operational efficiency (ROA)
- Decrease Net Interest Margin (NIM) volatility

- Make risk-based lending procedures stronger.

To better manage asset quality, State Bank of India should improve recovery procedures, boost operational effectiveness, and fortify its credit monitoring systems. ICICI Bank, on the other hand, ought to concentrate on preserving stability, upholding constant asset quality, and pursuing growth strategies that are balanced and risk-controlled. When these steps are implemented successfully, credit risk management procedures will be greatly enhanced, non-performing assets will be decreased, and the general stability and effectiveness of the Indian banking industry would be strengthened.

14. Future research scope:

The current study offers a number of avenues for further investigation into asset quality management and banking performance. To increase general knowledge, future research can compare more public, private, and cooperative banks in addition to State Bank of India and ICICI Bank. In order to pinpoint particular risk factors and policy requirements, sector-wise study of NPAs is also possible, particularly in MSME, agricultural, and infrastructure.

The use of digital banking tools like fintech, AI, and data analytics in anticipating and averting non-performing assets (NPAs) can be investigated further. Over time, post-pandemic research on credit stress and recovery patterns may offer more profound understanding. For improved forecasting, researchers may also employ sophisticated techniques like machine learning or panel data analysis. Lastly, a more thorough knowledge of credit risk in the Indian banking industry can be developed by taking into account elements like managerial conduct, governance quality, and regulatory responsiveness.

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