

Credit Risk Management Practices in Indian Public and Private Sector Banks: A Literature Review of Select Papers

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ARTICLE HISTORY

Paper Nomenclature: Review of Literature (RoL)

Paper Code: GJEISV17I4OD2025ROL3

Submission at Portal (www.gjeis.com): 04-Oct-2025

Manuscript Acknowledged: 15-Oct-2025

Originality Check: 23-Oct-2025

Originality Test (Plag) Ratio (Drillbit): 07%

Author Revert with Rectified Copy: 06-Nov-2025

Peer Reviewers Comment (Open): 09-Nov-2025

Single Blind Reviewers Explanation: 21-Nov-2025

Double Blind Reviewers Interpretation: 27-Nov-2025

Triple Blind Reviewers Annotations: 02-Dec-2025

Author Update (w.r.t.correction, suggestion & observation): 14-Dec-2025

Camera-Ready-Copy: 23-Dec-2025

Editorial Board Excerpt & Citation: 26-Dec-2025

Published Online First: 31-Dec-2025

ABSTRACT

Purpose: This study critically examines credit risk management (CRM) practices in Indian public and private sector banks. It identifies key drivers of non-performing assets (NPAs), compares ownership-based performance differences and evaluates the role of traditional and emerging AI and ML-based risk-management tools in enhancing banking stability.

Design/Methodology/Approach: A literature review was conducted of 37 selected research papers published between 2021 and 2025, from academic databases such as Scopus and Google Scholar, covering causes of credit risk, NPA management, comparative performance of public vs. private banks, credit risk measuring models and the incorporation of machine learning and explainable AI techniques.

Findings: In terms of asset quality, profitability, growth, operational effectiveness, and credit risk management techniques, private sector banks routinely outperform public sector banks while having lower non-performing assets (NPA) levels. Willful defaults, priority-sector lending, capital diversion, and macroeconomic shocks are the main causes of credit risk, which is still present today. Capital adequacy, liquidity, market discipline, and optimal earnings quality serve as effective buffers. Mergers improve solvency but not always efficiency. The Insolvency and Bankruptcy Code (IBC) has accelerated NPA resolution since 2018. Artificial Intelligence (AI), big data, ensemble models, and XAI (LIME/SHAP) greatly boost predictive models tailored to India for assessment of creditworthiness and default probability estimation are still in the developing stage.

Originality/Value: This review consolidates fragmented evidence into a cohesive framework which provides the most updated synthesis of ownership-wise CRM effectiveness in Indian banking highlights critical research gaps specially India-centric predictive and behavioral models and offers actionable implications for regulators, bankers and scholars in the post-digital and IBC era.

Paper Type: Review of Literature

KEYWORDS: Credit Risk Management | CRM | Banking Practices | Private Bank | Public Bank

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- Present Volume & Issue (Cycle): Volume 17 | Issue-4 | Oct-Dec 2025
- International Standard Serial Number:
Online ISSN: 0975-1432 | Print ISSN: 0975-153X
- DOI (Crossref, USA) <https://doi.org/10.18311/gjeis/2025>
- Bibliographic database: OCLC Number (WorldCat): 988732114
- Impact Factor: 3.57 (2019-2020) & 1.0 (2020-2021) [CiteFactor]
- Editor-in-Chief: Dr. Subodh Kesharwani
- Frequency: Quarterly
- Published Since: 2009
- Research database: EBSCO <https://www.ebsco.com>
- Review Pedagogy: Single Blind Review/ Double Blind Review/ Triple Blind Review/ Open Review
- Copyright: ©2025 GJEIS and it's heirs
- Publishers: Scholastic Seed Inc. and KARAM Society
- Place: New Delhi, India.
- Repository (figshare): 704442/13

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Introduction

The credit risk is the possibility of loss that a borrower fails to repay and it remains the biggest risk for Indian banks since lending dominates their asset mix (Aloun, 2024; Goswami, 2022; RBI, 2024; Supervision, 2019). Effective CRM is the foundation of banking stability, quality of assets, profitability and long-term viability. In this respect, (Brahmaiah, 2022; Butola et al., 2022; Chaudhary & Kumar, 2023; Solanki et al., 2023) of opinion. Indian banks work in a volatile macro environment characterized by fluctuating interest rates, sectoral imbalances, policy-led credit growth and periodic global shocks (Goswami & Malik, 2024; Naili & Lahrichi, 2022; Nikam, 2024; Rathnavalli et al., 2024). Public sector banks have traditionally been recording NPAs far above those of private banks, which consequently elevates credit risk exposure (Jain, 2022; Kanyan & Singh, 2024; Narayanan, 2020; Parab et al., 2024; RBI, 2022; Sami et al., 2024).

Standardized internal rating systems, risk-weighted assets, stricter capital adequacy requirements and stress testing were introduced by Basel II and III regulations. Stricter lending discipline and a significant increase in recovery have been brought about by the Insolvency and Bankruptcy Code, 2016 (Pathare & Sandhu, 2024; RBI, 2022; The Insolvency and Bankruptcy Code, 2016, 2021).

Due to their increased efficiency, private sector banks are able to provide better credit risk outcomes than public sector banks because of their rapid adoption of big data analytics, automated decision systems, complicated monitoring technologies and advanced technology for credit evaluation (Boddu et al., 2025; Brahmaiah, 2022; Krishnendu & Amitava, 2024; Kumar et al., 2024; Nallakaruppan et al., 2024; Sharma & Gupta, 2019; Venkateswararao et al., 2023).

Banks are shifting away from old methodologies towards integrated, data-driven comprehensive risk management. The use of big data, AI, ensemble models, and explainable AI is increasingly seen not just as compliance but a strategic edge

that provides competitive advantage with sustainable growth in the banking sector of India (Bhattacharya et al., 2023; Boddu et al., 2025; Dacre et al., 2024; Joshi, 2023; Nallakaruppan et al., 2024; RBI, 2022).

This study is important as it explores the credit risk management practices of both public as well as private sector banks, various findings from existing literature and discusses the key findings of studies.

The study reviewed the existing literature illustrates certain research themes listed below: -

1. Credit Risk Management Practices: Public vs. Private Sector Banks
2. NPA Management & Comparative Performance
3. Models & Techniques of Credit Risk Management
4. Holistic Bank Performance & Stability

Research Methodology

This literature review discusses how Indian public and private sector banks managed credit risk between 2021 and 2025, based on a literature review of secondary sources available in databases like Scopus and Google Scholar. Keywords that have been used in the search include “credit risk management” and “CRM” to identify those scholarly works discussing main factors shaping modern Credit risk management practices.

Literature Review

In this section, the author's main purpose is to perform a literature review on several key aspects correlated to credit risk management. These components comprise the practices and interpretations of CRM; they impact the banking system as well as national economies. this study utilized Scopus, Google Scholar and Open Access databases to search relevant papers on credit risk management practices.

Table 1: Credit Risk Management Practices: Public vs. Private Sector Banks

Author(s)	Main Findings
(Goswami, 2022)	Improved profitability, efficiency, diversified revenue streams and optimal scale besides regulatory compliance significantly enhance the quality of credits, while public sector banks still retain depositor confidence during crises whereas liquidity is the main determinant of private banks' asset quality.
(Butola et al., 2022)	Capital to deposits ratio, operating profit margin and capital adequacy significantly increases the return on assets while net interest margin and net non-performing assets have a significant negative effect. The underexplored roles played by the capital-to-deposit and provision coverage ratios highlight important omissions in the literature on profitability.
(Naili & Lahrichi, 2022)	Bank-specific, macroeconomic and industry-level determinants are the influential factors on non-performing loans. There are considerable research gaps that still exist specially with respect to emerging economies concerning the dynamics of credit risk and evolving post-crisis patterns of asset-quality deterioration.
(Krishnendu & Amitava, 2024)	Private sector banks show much higher growth rates and have gained higher market shares in credit advances relative to public sector banks. Statistically significant differences across key performance parameters are observed under different ownership types with GDP growth emerging as a critical macroeconomic driver of sectoral expansion.
(Bhat et al., 2024)	While insufficient market discipline significantly perpetuates the problem of non-performing loans and greater informational transparency significantly advances higher capital ratios. Interbank deposits however, bear no statistically significant influence on banks' determination of capital structures showing minimal disciplinary pressure by interbank funding markets.

Source: Author's Own

Table 2: NPA Management and Comparative Performance

Author (s)	Main Findings
(Jain, 2022)	The State Bank of India has the best figures both on gross and net NPA ratios. Gross NPA ratios are very different among banks but provision coverage ratios remain relatively similar. Public sector banks bear the heavier burden of NPAs, mainly because of higher default rates.
(Brahmaiah, 2022)	Private sector banks exhibit better credit risk management through stronger asset quality and profitability while public sector banks generally display consistently higher NPA levels. The banks take care of credit, market and operational risks with processes that are well-structured and clearly outlined for identification, measurement, monitoring and control.
(Agarwal & Preeti, 2022)	NPAs increased in both public and private banks with Punjab National Bank turning in the worst performance. Private banks are relatively better in terms of maintaining asset quality, though increases in NPAs were generally due to borrower defaults and weak macroeconomic and sectoral conditions.
(Kanyan & Singh, 2024)	While non-priority lending is observed to be the main driver of NPAs in private and foreign banks, public banks have meaningful contributions from both priority and non-priority sectors. The biggest contributors are the industry, agriculture and MSMEs, a finding reinforced by fully modified ordinary least squares analysis.
(Nikam, 2024)	ROA and ROE are contingent upon asset quality and liquidity, GDP growth as well as interest rates. The higher the cost-to-deposit ratio the more it hurts liquidity-the way profitability is closely tied to how well liquidity management is executed.
(Das, 2025)	Interest income remains a central pillar of bank profitability. The NIM is broadly negatively linked to NPAs, suggesting risk-taking under pressure on margins. Secured lending is a double-edged sword: more collateral often lowers NPAs but can invite moral hazard and raise credit risk.
(Sanati & Bhandari, 2024)	High competition, continuous macroeconomic growth and lower funding costs are improving efficiency while reducing credit risk. These factors support discipline in the use of resources and judicious lending to ultimately bring down both the probability and magnitude of NPAs in the banking system.
(Richa Verma & Krishnakumar, 2023)	According to responses from the survey of banking professionals, the major causes of NPAs are fund diversion and willful defaults by promoters. Long-drawn legal procedures and poor macroeconomic conditions continue to hinder recovery.

Source: Author's Own

Table 3: Models & Techniques of Credit Risk Management

Author (s)	Main Findings
(Sharma, 2022)	Punjab National Bank follows with RBI directives on loan appraisal, monitoring and recovery system which highlights borrower credibility and reliability, collateral strength and risk assessment. Although strict regulation manages non-performing assets by effective manner, competitive pressures and unfavorable macroeconomic environments persistently hinder comprehensive asset-quality enhancement.
(Anand & Haripriya, 2023)	Bank of Baroda, Bank of India and State Bank of India demonstrated the strongest ratio-based performance, while all sampled banks-maintained Z-scores (> 2.6). Considerable variation characterizes existing credit risk strategies, necessitating greater standardization and carefully organized implementation across public sector banks.
(Solanki et al., 2023)	Banks with strong credit risk management practices result in substantially lower default rates and higher return on assets. Still the main issue is credit risk and there is strong quantitative evidence that better identification, measurement technique and management procedures significantly improve financial performance.



Author (s)	Main Findings
(Aloun, 2024)	Primarily credit risk originates from default by the borrower. Effective modelling, regular monitoring, portfolio diversification and strict regulatory measures are required for good management. Worldwide financial crises enhance risks, rendering diverse exposures and sufficient capital buffers crucial for ensuring banking sector resilience and stability.
(Joshi, 2023)	Credit risk, market risk and operational risks are minimized through the systematic assessment and regulatory compliance, Using the ensemble modeling techniques the total effectiveness of risk-management frameworks in commercial banks is enhanced as well as forecast accuracy also increased.
(Bhattacharya et al., 2023)	Specifically, machine learning and ensemble methods outperform traditional statistical techniques for credit risk modeling, while the hybrid ensembles give the best performance. Despite widespread use of Australian and German benchmark datasets, together with the enhanced transparency in hyperparameter optimization, model interpretability is an essential for regulatory and operational adoption purposes.
(Kumar et al., 2024)	Artificial intelligence greatly empowers financial risk management with superior model validation, risk modeling, stress testing and data preparation. Besides, AI enables continuous information-quality monitoring, fraud detection and targeted information retrieval thereby substantially improving the accuracy and operational efficiency of banking institutions.
(Nallakaruppan et al., 2024)	Artificial Intelligence combined with Big Data analytics significantly enhances creditworthiness evaluation by unearthing complex non-linear patterns and giving better predictive performance compared to traditional metrics. Utilizing LIME (Local Interpretable Model-agnostic Explanations) and SHAP (SHapley Additive Explanations) explanation frameworks enhances the explainability of explainable AI models substantially. This will enable both local and global explainability of credit decisions.
(Rathnavalli et al., 2024)	Real estate and manufacturing exposures impact NPAs less than macroeconomic factors. Higher interest rates increase borrowing costs and raise the probability of default risk which thus underlines monetary policy's key influence in banking sector asset quality and portfolio performance.
(Tabassum & Yameen, 2024)	Larger banks are much more actively involved in the CDS market which indicates that markets view them as more trustworthy. Bank size is positively co-related to CDS activity because CDS offers an efficient way to hedge credit risk, increases bank liquidity and also implies regulatory capital relief. However, extensive use of CDS may undermine lending volume and encourage excessive risk-taking, especially during bad times.
(Pathare & Sandhu, 2024)	Statistical analyses underline the main drivers of NPA and the imperative for robust credit appraisal systems. The Insolvency and Bankruptcy Act has greatly enhanced stressed asset recovery, consequently reducing NPAs from 2018 to 2021. However, predictive models tailored to India for assessment of creditworthiness and default probability estimation are still developing.
(Boddu et al., 2025)	Through sophisticated credit scoring systems, fraud detection and compliance monitoring, artificial intelligence is transforming banking and fintech. The major aspect for AI usage is a systematic framework focusing on transparency and ethical governance that may help optimize decision-making and operational performance within the financial services sector.

Source: Author's Own

Table 4: Holistic Bank Performance & Stability

Author(s)	Main Findings
(Pinki & Sapna, 2022)	HDFC Bank outperformed SBI on all counts. Private banks were more efficient and profitable because of the impact of competition and merger, while public sector banks were hurt by recessionary pressures and high levels of non-performing assets.
(Khan et al., 2021)	HDFC and SBI continue to be the largest sources of systemic risk. With private banks, the role of risk transmission has strengthened since 2015, while smaller public banks PNB and BOB emerged as significant risk absorbers and propagators. Elevated market volatility and global shocks have hurt banking sector returns.
(Jose & Jegadeeshwaran, 2024)	Bank mergers significantly improved earnings as well as operational competency of SBI during that period, still liquidity grew as the bank size increased, however quality and liquidity proved statistically significant post-merger, confirming that consolidation drives profitability enhancement without concomitant improvement in liquidity management.
(Kantharaju et al., 2024)	Kotak Mahindra Bank topped the overall ranking list, followed by ICICI Bank and State Bank of India. Statistical tests indicated that there was no significant difference in the performance of public and private sector banks. However, private banks still fared better from an operational efficiency perspective. These findings will give useful insights to the regulatory authorities in designing evidence-based policy intervention.
(Parab et al., 2024)	Private banks reflect much better profitability and efficiency, whereas public banks record larger NPAs but far more stability. Sharp asset quality and return differences persist, with investors continuing to favor private banks for their stronger growth potential and performance outcomes.
(Othman et al., 2024)	All the banks met the 9% Capital Adequacy Ratio Criteria, with Kotak Mahindra Bank leading comprehensively. Significant inter-group disparities were detected in all CAMEL components except liquidity. Private banks registered higher growth, better advances management and overall superior performance while public banks remained burdened by continually increasing higher non-performing assets.
(Mishra & Mohanty, 2024)	Post-merger performance is mixed: ROA, ROE and CRAR improve in a number of cases, while efficiency gains are insignificant. Mergers reliably raise the levels of capital adequacy and solvency; by contrast, profitability outcomes vary substantially among consolidating banks.
(Bansal & Singh, 2024)	Yes Bank failed mainly due to excessive NPAs, over-aggressive advances, chronic capital inadequacy, and insider abuse. These vulnerabilities were more extreme than in Lakshmi Vilas Bank, therefore indicating deeper governance and risk-management deficiencies.
(Goswami & Malik, 2024)	Macroeconomic conditions, government intervention, income diversification and systemic risk provide the broad background in which banks make decisions on their lending actions and performance in situations of uncertainty, underscoring the critical interaction between external macroeconomic dynamics and internal strategic choices.
(Sanati & Bhandari, 2024)	Priority sector lending significantly reduces bank efficiency and weakens credit risk management. The results indicate that lower mandated lending rates are associated with higher default rates, thus suggesting that regulatory priority sector obligations substantially increase the riskiness of banks' loan portfolios.
(Mulchandani et al., 2025)	Theoretical analysis reveals an inverted U-shaped association between earnings quality and bank lending indicating an optimal monitoring threshold while empirical findings conclude that bankers rely more on collateral rather than earnings quality, thus increasing credit risk exposure.
(Sami et al., 2024)	An analysis of five major Indian commercial banks over a 12- year period using the CAMEL framework yielded an average composite rating of 1, signifying robust financial health. The banks had a strong Capital Adequacy Ratio of 15.18% and an average Non-Performing Loan ratio of only 1.98%, evidencing effective risk management. Results confirm that private sector banks consistently outperform public sector counterparts with superior performance, especially in capital adequacy, asset quality, and management efficiency, which are key determinants of sustained stability and growth.

Source: Author's Own



Discussion

Credit risk is persistent in the Indian banking sector, facilitated by factors such as willful defaults, fund diversion, priority-sector obligations and macroeconomic shocks (Agarwal & Preeti, 2022; Nallakaruppan et al., 2024; Richa Verma & Krishnakumar, 2023; Sanati & Bhandari, 2024). Private sector banks consistently show better asset quality, profitability such as return on assets and return and equity, operational efficiency, growth rates and advances management compared to public sector banks, which bear the NPA burden yet also hold depositor confidence in times of crisis (Boddu et al., 2025; Brahmaiah, 2022; Jain, 2022; Kanyan & Singh, 2024; Krishnendu & Amitava, 2024; Othman et al., 2024; Parab et al., 2024; Sami et al., 2024). Capital adequacy, liquidity, market discipline and optimal earnings quality play a role as critical buffers. In contrast, compressed net interest margins and over-reliance on collateral will inadvertently encourage risk-taking practices (Bhat et al., 2024; Butola et al., 2022; Mulchandani et al., 2025; Nikam, 2024; Sanati & Bhandari, 2024). In many cases, mergers improve earnings and solvency but rarely enhance efficiency or liquidity (Jose & Jegadeeshwaran, 2024; Mishra & Mohanty, 2024). Systemic risk remains focused in the largest banks such as HDFC and SBI, with private banks emerging as stronger risk transmitters post 2015 (Khan et al., 2021). The Insolvency and Bankruptcy Code has significantly accelerated NPA resolution since 2018 (Pathare & Sandhu, 2024), yet governance failures and hidden stressed assets continue to trigger individual bank collapses (Nallakaruppan et al., 2024). Recent literature has increasingly emphasized the transformative potential of AI, big data and explainable AI frameworks such as LIME and SHAP in credit scoring, fraud detection and stress testing, although India-specific tailored predictive models remain developing (Bhattacharya et al., 2023; Boddu et al., 2025; Nallakaruppan et al., 2024; Pathare & Sandhu, 2024). Taken together, these findings emphasize the credit risk management practices of Indian public and private sector banks and their relative strength and weakness, pressing the need to think about adopting local-calibrated advanced risk-management technologies for the banking system.

Conclusion

Private sector banks consistently outperform public sector banks across several dimensions such as higher asset quality, better profitability as reflected by returns on asset and return on equity, higher operational efficiency, healthier growth rate and efficient advanced management. Core factors play a safeguard role include adequate capitalization, sufficient liquidity, prudent market behavior and the ability to generate high-quality earnings and there are also challenges associated with compressed net interest margins and excessive reliance on collateral that could lead to riskier behavior by banks. Mergers have generally improved solvency and earnings but seldom produced meaningful efficiency and liquidity.

The implementation of the Insolvency and Bankruptcy Code has hastened the resolution of non-performing assets. Furthermore, advancements in artificial intelligence, big data and explainable AI frameworks are being utilized for credit scoring, fraud detection and stress testing, although there is still a lack of robust predictive models tailored to the Indian context.

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Annexure 17.4.10

Submission Date	Submission Id	Word Count	Character Count
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<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>7</p> <p>SIMILARITY %</p> </div> <div style="text-align: center;"> <p>6</p> <p>MATCHED SOURCES</p> </div> <div style="text-align: center;"> <p>A</p> <p>GRADE</p> </div> </div>		<p>A-Satisfactory (0-10%) B-Upgrade (11-40%) C-Poor (41-60%) D-Unacceptable (61-100%)</p>																											
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**Reviewers
Memorandum**

Reviewer's Comment 1: This study addresses an important area of credit risk management and provides a clear overview of existing practices. The objectives are well defined, and the literature review is relevant and updated. The study adds value by linking theory with practical implications for financial institutions, especially in emerging market contexts.

Reviewer's Comment 2: The research methodology is appropriate and adequately explained, allowing readers to understand how conclusions are drawn. Data sources and analytical approaches are relevant to the research problem. However, the paper would benefit from a clearer justification of variable selection and a brief discussion on potential limitations to strengthen the overall credibility of the findings.

Reviewer's Comment 3: The findings are well presented and offer useful insights into how credit risk management practices influence financial stability. The discussion is meaningful and connects results with prior studies. Minor improvements in organisation and clarity of language would enhance readability and ensure that key insights are easily understood by both academic and practitioner audiences.

**Citation**

Saiyad Raja, Sanjay Kumar Bhanwara and Anurag Saxena
"Credit Risk Management Practices in Indian Public and Private Sector Banks: A Literature Review of Select Papers"
Volume-17, Issue 4, Oct-Dec 2025. (www.gjeis.com)

<https://doi.org/10.18311/gjeis/2025>
Volume-17, Issue 4, Oct-Dec 2025

Online ISSN : 0975-1432, Print ISSN : 0975-153X
Frequency : Quarterly, Published Since : 2009

Google Citations: Since 2009
H-Index = 96
i10-Index: 964

Source: <https://scholar.google.co.in/citations?user=S47TtNkAAAAJ&hl=en>



Conflict of Interest: Author of a Paper had no conflict neither financially nor academically.

**Editorial
Excerpt**

The article has 07% plagiarism, which is within the accepted percentage as per the norms and standards of the journal for publication. As per the editorial board's observations and blind reviewers' remarks, the paper had some minor revisions, she was communicated promptly to the authors (Saiyad, Sanjay and Anurag), and all necessary corrections were incorporated as and when directed. The Comments related to this manuscript are closely aligned with the theme "Credit Risk Management Practices in Indian Public and Private Sector Banks: A Literature Review of Select Papers" both subject-wise and research-wise. This paper reviews credit risk management practices used by banks and financial institutions. It explains different tools and methods applied to control credit risk and highlights their role in maintaining financial stability and reducing loan defaults. After thorough reviews and the editorial board's remarks, the manuscript has been categorized and approved for publication under the "Review of Literature" category

Acknowledgement

The acknowledgement section is an essential part of all academic research papers. It provides appropriate recognition to all contributors for their hard work and effort taken while writing a paper. The data presented and analysed in this paper by the authors (Saiyad, Sanjay and Anurag) were collected first handily and wherever it has been taken the proper acknowledgment and endorsement depicts. The author is highly indebted to others who facilitated accomplishing the research. Last but not least, endorse all reviewers and editors of GJEIS in publishing in the present issue.

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