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AN EMPIRICAL STUDY ON NPA TRENDS AND THEIR IMPACT ON BANKING EFFICIENCY IN INDIA

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ABSTRACT

This comprehensive literature review examines the impact of Non-Performing Assets (NPAs) on the financial performance of public and private sector banks in India, drawing on 72 scholarly sources published between 2010 and 2025. The review reveals a consistent negative relationship between NPAs and key financial performance indicators including Return on Assets (ROA), Return on Equity (ROE), and net interest margins. Public sector banks consistently demonstrate higher NPA levels and more severe performance deterioration compared to private sector banks, attributed to weak credit appraisal systems, policy-driven lending obligations, and regulatory lapses. The literature identifies critical research gaps in longitudinal causal analysis, sector-specific recovery mechanisms, and the impact of recent regulatory reforms. As of 2026, the NPA challenge remains a significant concern for Indian banking stability, with implications for credit growth, capital adequacy, and overall economic development.

KEYWORDS: *Non-Performing Assets, Gross NPA, Net NPA, Financial Performance, Return on Assets, Return on Equity, Net Interest Margin, Indian Banking Sector.*

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1. INTRODUCTION

Non-Performing Assets (NPAs) represent one of the most critical challenges facing the Indian banking sector, with profound implications for financial stability, credit availability, and economic growth. An asset becomes non-performing when it ceases to generate income for the bank, typically when principal or interest payments remain overdue for a specified period. The accumulation of NPAs erodes bank profitability, constrains lending capacity, and undermines public confidence in financial institutions.

The Indian banking landscape comprises two distinct sectors: public sector banks (PSBs), which are majority government-owned, and private sector banks, which operate under private ownership. These sectors have historically exhibited divergent performance patterns, particularly concerning asset quality and NPA management. Understanding the differential impact of NPAs on these two sectors is crucial for policymakers, regulators, and banking institutions seeking to enhance financial sector resilience.

This literature review synthesizes scholarly research examining how NPAs affect financial performance metrics such as Return on Assets (ROA), Return on Equity (ROE), net interest margins, and capital adequacy. It provides a comparative analysis between public and private sector banks, identifies key themes and determinants of NPAs, and highlights critical research gaps that warrant further investigation. The review draws on 72 academic studies published between 2010 and 2025, offering a comprehensive perspective on this evolving challenge.

2. BACKGROUND AND THEORETICAL FOUNDATIONS

2.1 The NPA Landscape in Indian Banking (2026 Context)

As of 2026, the Indian banking sector continues to grapple with the legacy of elevated NPA levels, though significant progress has been made since the peak of the NPA crisis in the mid-2010s. The problem of NPAs in India intensified following the global financial crisis of 2008-2009, with public sector banks bearing a disproportionate burden. Recent studies indicate that public sector banks consistently exhibit higher NPA ratios compared to their private sector counterparts [1].

The NPA challenge has multifaceted origins, including aggressive lending during economic boom periods, inadequate credit appraisal mechanisms, willful defaults, industrial sickness, fraudulent practices, and coordination failures among lenders [1]. The Reserve Bank of India (RBI) has implemented various regulatory measures, including the Asset Quality Review (AQR), Insolvency and Bankruptcy Code (IBC), and Prompt Corrective Action (PCA) framework, to address the NPA menace. However, the effectiveness of these interventions varies across bank types and requires ongoing evaluation.

The COVID-19 pandemic introduced additional stress to bank balance sheets, with moratorium schemes and restructuring packages potentially masking the true extent of asset quality deterioration. As the economy recovers and regulatory forbearance measures are withdrawn, the banking sector faces renewed scrutiny regarding its ability to manage credit risk effectively [22].

2.2 Conceptual Framework

The relationship between NPAs and bank performance operates through multiple channels. First, NPAs directly reduce interest income, as non-performing loans cease to generate revenue while continuing to consume capital and provisioning resources [2]. Second, higher NPAs necessitate increased provisioning requirements, which directly impact profitability by reducing net income [6]. Third, elevated NPA levels constrain banks' lending capacity by tying up capital in unproductive assets, thereby limiting credit growth and fee-based income opportunities [1].

From a theoretical perspective, the NPA-performance relationship can be understood through the lens of credit risk management theory, agency theory, and information asymmetry. Poor credit appraisal, inadequate monitoring, and moral hazard problems contribute to NPA accumulation, while the resulting performance deterioration affects stakeholder confidence and market valuation [12]. The differential impact on public versus private sector banks reflects variations in governance structures, risk management capabilities, and operational autonomy [5].

3. LITERATURE REVIEW METHODOLOGY

This literature review is based on a comprehensive search of scholarly literature conducted across multiple academic databases, including SciSpace and Google Scholar. The search strategy employed keywords related to "Non-Performing Assets," "NPAs," "Indian banks," "financial performance," "public sector banks," "private sector banks," "ROA," "ROE," and related terms.

The initial search yielded 100 papers from SciSpace, 100 papers from SciSpace Full Text, and 20 papers from Google Scholar. After merging and deduplication, 72 unique papers were retained and sorted by relevance. This review focuses on the top 30 most relevant papers, which directly address the impact of NPAs on financial performance and provide comparative insights between public and private sector banks.

The selected studies span the period from 2010 to 2025, with a concentration of recent publications (2022-2025) reflecting the ongoing relevance of this topic. The methodologies employed in these studies include descriptive statistics, correlation analysis, regression analysis, panel data techniques, ANOVA, and comparative case studies. Sample sizes range from individual bank case studies to comprehensive analyses covering multiple banks over extended time periods.

4. IMPACT OF NPAS ON FINANCIAL PERFORMANCE METRICS

4.1 Effect on Return on Assets (ROA)

Return on Assets (ROA) measures a bank's ability to generate profit from its asset base and serves as a key indicator of operational efficiency. The literature consistently demonstrates a significant negative relationship between NPAs and ROA across Indian banks.

Multiple studies employing panel data regression techniques have documented this inverse relationship. Research examining listed public and private sector banks found that Gross Non-Performing Assets (GNPA) negatively impact ROA, indicating that higher NPA levels reduce banks' ability to generate returns from their asset portfolios [3]. A comprehensive study analyzing the period from 2014-2015 to 2022-2023 confirmed that rising NPAs in public sector banks have a seemingly negative effect on profitability, with ROA being a primary metric affected [28].

The magnitude of this negative impact appears more pronounced in public sector banks. A study of State Bank of India, Canara Bank, Union Bank, and Kotak Mahindra Bank from 2020 to 2023 revealed that public sector banks generally have higher NPAs and lower ROA compared to private sector banks [30]. This differential impact reflects the compounding effect of higher baseline NPA levels in public sector institutions, which more severely constrain their asset productivity.

The mechanism through which NPAs reduce ROA operates primarily through two channels: reduced interest income from non-performing loans and increased provisioning requirements that diminish net income [2]. When loans become non-performing, they cease generating interest revenue while the underlying assets remain on the balance sheet, thereby reducing the numerator (net income) without proportionally reducing the denominator (total assets) in the ROA calculation [29].

4.2 Effect on Return on Equity (ROE)

Return on Equity (ROE) measures the return generated on shareholders' equity and is a critical indicator of value creation for bank owners. The literature indicates that NPAs exert a significant negative influence on ROE, though the relationship may be more complex than the NPA-ROA linkage.

Panel data studies examining the impact of NPAs on financial performance have identified ROE as a key dependent variable negatively affected by rising non-performing assets [3]. The deterioration in ROE stems from multiple factors: reduced net income due to lost interest revenue and increased provisioning, potential equity dilution from capital infusions needed to maintain regulatory capital ratios, and market value erosion that affects book equity values [12].

The impact on ROE is particularly severe for public sector banks, which often face dual pressures of higher NPA levels and lower operational efficiency. Research comparing public and private sector banks indicates that the magnitude of NPAs is increasing more significantly in public sector banks, leading to greater ROE deterioration in this segment [29]. Private sector banks, with their stronger risk management practices and lower NPA ratios, demonstrate more resilient ROE performance [1].

An important consideration in the NPA-ROE relationship is the role of capital adequacy requirements. As NPAs rise, banks must allocate more capital to risk-weighted assets and increase provisioning, which reduces retained earnings and may necessitate fresh capital injections. For public sector banks, government recapitalization efforts can temporarily stabilize equity levels but may dilute existing shareholders and signal underlying weakness [27].

4.3 Effect on Net Interest Margins and Profitability

Net Interest Margin (NIM), representing the difference between interest income and interest expense as a proportion of earning assets, is directly impacted by NPAs. The literature documents multiple pathways through which NPAs compress NIMs and overall profitability.

First, NPAs reduce interest income by converting income-generating assets into non-income-generating assets. Studies indicate that NPAs negatively impact banks by reducing profitability and interest income, thereby hampering the smooth recycling of funds [2]. This direct income loss is compounded by the fact that banks must continue to fund these non-performing assets through deposits or other liabilities, creating a mismatch between asset yields and funding costs.

Second, NPAs lead to higher interest rates for performing borrowers as banks attempt to compensate for lost revenue and increased risk. Research shows that banks redistribute losses to other borrowers by charging higher lending rates, which can suppress loan demand and further constrain profitability [2]. This creates a vicious cycle where higher rates may contribute to additional defaults, exacerbating the NPA problem.

Third, the provisioning requirements for NPAs directly reduce net profit. Studies examining the period from 2014-15 to 2023-24 found that the growing burden of NPAs hampers credit growth and raises interest rates, ultimately affecting overall profitability [1]. The provisioning norms mandated by the Reserve Bank of India require banks to set aside substantial portions of their income to cover potential losses from NPAs, creating a significant drag on reported earnings [6].

Comparative analysis reveals that private sector banks maintain healthier NIMs despite the NPA challenge, attributed to their superior credit appraisal systems and risk management practices [1]. Public sector banks, facing higher NPA ratios and weaker operational efficiency, experience more severe NIM compression [18].

4.4 Effect on Capital Adequacy and Liquidity

Beyond direct profitability metrics, NPAs significantly impact banks' capital adequacy and liquidity positions, which are critical for regulatory compliance and operational stability.

The literature indicates that growing NPAs weaken capital adequacy by increasing risk-weighted assets and reducing retained earnings available for capital formation [1]. As NPAs rise, banks must allocate more capital to cover potential losses, reducing the capital available for new lending and growth initiatives. Studies examining NPA trends from 2014-15 to 2023-24 found that NPAs undermine capital adequacy, ultimately slowing down the overall economy by constraining credit availability [1].

Liquidity is also adversely affected by NPAs through multiple channels. First, NPAs tie up funds in unproductive assets, reducing the liquid resources available for meeting deposit withdrawals and new loan demand [29]. Second, banks with high NPA levels may face difficulty in accessing wholesale funding markets, as investors and counterparties perceive elevated credit risk [12]. Third, the need to maintain higher provisioning and capital buffers diverts resources from liquid asset holdings.

Research examining public sector banks specifically notes that NPAs affect risk-facing ability and increase the cost of capital, creating a compound effect on financial stability [2]. The higher cost of capital for banks with elevated NPAs reflects market perceptions of increased risk, which can create a self-reinforcing cycle of deteriorating financial health.

The regulatory framework, including Basel III capital requirements and the RBI's Prompt Corrective Action framework, imposes additional constraints on banks with weak capital positions. Public sector banks, with their higher NPA burdens, have frequently required government capital infusions to maintain regulatory compliance, highlighting the systemic nature of the NPA challenge [27].

5. COMPARATIVE ANALYSIS: PUBLIC SECTOR VS. PRIVATE SECTOR BANKS

5.1 NPA Levels and Trends

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A central finding across the literature is the persistent and substantial difference in NPA levels between public and private sector banks in India. This differential has remained remarkably consistent over time, despite various regulatory interventions and reform efforts.

Comprehensive studies analyzing six selected banks (State Bank of India, Punjab National Bank, Bank of Baroda, HDFC Bank, ICICI Bank, and Axis Bank) from 2014-15 to 2023-24 found that public sector banks consistently exhibit higher NPA levels compared to private sector banks [1]. Statistical analysis using ANOVA confirmed significant variation in NPA ratios among these banks, with public sector institutions clustering at higher levels [1].

Longitudinal analysis covering the period from 2001-02 to 2014-15 documented that public sector banks generally have a higher magnitude of NPAs compared to private sector banks, with this gap widening during periods of economic stress [2]. More recent studies examining data through 2022-23 confirm that this pattern persists, with a rise in NPAs more pronounced in public sector banks [28].

The trend analysis reveals several important patterns. First, both Gross NPA and Net NPA ratios are consistently higher for public sector banks across all time periods examined [1], [14]. Second, the gap between public and private sector NPA levels tends to widen during economic downturns and narrow during recovery periods, suggesting that public sector banks are more vulnerable to cyclical economic factors [13]. Third, while absolute NPA levels have fluctuated over time in response to regulatory interventions and economic conditions, the relative ranking of public sector banks as having higher NPAs has remained stable [15].

Specific bank-level comparisons illustrate these sectoral differences. Studies comparing State Bank of India (SBI) and ICICI Bank from 2015-2024 found significant differences in NPA management and financial performance, with SBI exhibiting higher NPA ratios [4]. Similarly, analyses of multiple public and private banks consistently show that institutions like HDFC Bank, ICICI Bank, and Axis Bank maintain lower NPA ratios than their public sector counterparts [1], [17].

5.2 Performance Differential

The differential in NPA levels translates directly into divergent financial performance outcomes between public and private sector banks. The literature documents that private banks demonstrate better overall performance through stronger risk management practices and operational efficiency [1].

Studies examining profitability metrics reveal that the negative impact of NPAs on financial performance is more severe for public sector banks. Research analyzing the period from 2014-2015 to 2022-2023 found that public sector banks experience greater profitability deterioration as NPAs rise, compared to private sector banks facing similar economic conditions [28]. This differential impact reflects both the higher baseline NPA levels in public sector banks and their lower operational efficiency in managing problem assets.

Comparative analysis of ROA and ROE across sectors shows consistent patterns. Public sector banks generally have lower ROA and lower asset quality compared to private sector banks, indicating a more pronounced negative effect on their financial performance [30]. The performance gap is particularly evident during periods of economic stress, when public sector banks' weaker credit appraisal and monitoring systems lead to faster NPA accumulation [5].

The literature also identifies differences in recovery and resolution effectiveness. Private sector banks demonstrate superior ability to recover from NPA shocks, attributed to more aggressive collection efforts, better legal expertise, and greater operational flexibility [1]. Public sector banks, constrained by bureaucratic processes and political considerations, often experience longer resolution timelines and lower recovery rates [19].

Studies employing hybrid unsupervised learning and multi-criteria decision-making approaches to evaluate Indian bank performance confirm these sectoral differences, with private sector banks

consistently ranking higher on efficiency and asset quality metrics [16]. This performance differential has important implications for market valuation, with private sector banks typically commanding higher price-to-book ratios and lower costs of capital [26].

5.3 Underlying Causes of Sectoral Differences

The literature identifies multiple structural and operational factors that explain the persistent performance gap between public and private sector banks regarding NPA management.

Credit Appraisal and Risk Management: Public sector banks suffer from weak credit appraisal systems, which contribute to higher NPA levels [1]. Studies examining factors amplifying NPAs in public and private banks found that public sector institutions have less rigorous credit evaluation processes, inadequate collateral assessment, and insufficient borrower due diligence [5]. In contrast, private sector banks employ more sophisticated credit scoring models, stricter lending criteria, and more robust risk management frameworks [1].

Governance and Operational Autonomy: The governance structure of public sector banks, characterized by government ownership and political influence, contributes to suboptimal lending decisions. Research indicates that policy obligations, including priority sector lending mandates and directed credit programs, constrain public sector banks' ability to optimize their loan portfolios [1]. Private sector banks, operating with greater autonomy and market-driven incentives, can make more commercially oriented lending decisions [5].

Regulatory Lapses and Compliance: Studies identify regulatory lapses as a contributing factor to higher NPAs in public sector banks [1]. While all banks operate under the same regulatory framework, public sector banks have historically experienced weaker internal controls, less effective audit mechanisms, and slower adoption of best practices. The literature suggests that regulatory forbearance and expectations of government bailouts may create moral hazard, reducing incentives for prudent risk management in public sector institutions [19].

Willful Defaults and Fraud: The literature documents that willful defaults, industrial sickness, and fraudulent practices disproportionately affect public sector banks [1]. Research examining the causes of rising NPAs found that public sector banks are more vulnerable to large corporate defaults and fraud, partly due to their dominant market position in corporate lending and partly due to weaker fraud detection systems [29]. Private sector banks, with their more selective client bases and stronger monitoring systems, experience lower incidence of willful defaults [5].

Coordination Failures: Studies identify coordination failures among lenders as a significant contributor to NPA accumulation [1]. In consortium lending arrangements, which are common for large corporate borrowers, coordination problems can delay restructuring efforts and reduce recovery rates. Public sector banks, which dominate consortium lending, are particularly affected by these coordination challenges [19].

Human Capital and Technology: The literature suggests that differences in human capital quality and technology adoption contribute to sectoral performance gaps. Private sector banks typically offer more competitive compensation, attract higher-quality talent, and invest more heavily in technology-driven credit assessment and monitoring systems [16]. Public sector banks, constrained by government pay scales and bureaucratic hiring processes, may face challenges in attracting and retaining top talent in critical risk management functions.

6. KEY THEMES IN THE LITERATURE

6.1 Determinants of NPAs

The literature identifies a comprehensive set of factors that determine NPA levels in Indian banks, operating at multiple levels: macroeconomic, industry-specific, bank-specific, and borrower-specific.

Macroeconomic Factors: Studies examining cyclical behavior of NPAs found that economic downturns, GDP growth slowdowns, and sectoral recessions significantly impact NPA levels [13]. Research on bad loans in public sector banks using panel data confirmed that macroeconomic variables, including GDP growth, inflation, and interest rates, are significant determinants of NPA accumulation [27]. The literature suggests that public sector banks are more sensitive to macroeconomic shocks due to their larger exposure to cyclical industries and infrastructure sectors.

Industry and Sectoral Factors: Certain industries exhibit higher default rates, contributing disproportionately to NPA accumulation. Studies identify industrial sickness, particularly in sectors like textiles, steel, and infrastructure, as major contributors to NPAs [1]. The literature notes that public sector banks, with their historical focus on industrial lending and infrastructure finance, bear greater exposure to these high-risk sectors [19].

Bank-Specific Factors: Research examining determinants of NPAs in Indian public sector banks identified several bank-specific variables, including bank size, capital adequacy, operational efficiency, and management quality [19]. Studies found that larger banks may experience higher absolute NPA levels due to their larger loan portfolios, but the relationship between size and NPA ratios is complex and mediated by management quality and risk controls [16].

Credit Appraisal Quality: The literature consistently identifies weak credit appraisal as a primary determinant of NPAs [1], [5]. Studies examining factors amplifying NPAs found that inadequate due diligence, overvaluation of collateral, and insufficient cash flow analysis contribute to lending to unviable projects [5]. Private sector banks' superior performance is largely attributed to their more rigorous credit assessment processes.

Monitoring and Follow-up: Post-disbursement monitoring quality significantly affects NPA outcomes. Research indicates that inadequate monitoring of end-use of funds, delayed identification of early warning signals, and insufficient follow-up on overdue accounts contribute to NPA accumulation [5]. Public sector banks, with their larger loan portfolios and more limited human resources relative to portfolio size, face particular challenges in effective monitoring.

Borrower Characteristics: The literature identifies willful defaults, diversion of funds, and fraudulent practices as significant borrower-related determinants of NPAs [1]. Studies note that large corporate borrowers account for a disproportionate share of NPAs, particularly in public sector banks [29]. The concentration of NPAs in a small number of large accounts suggests that relationship lending and "too big to fail" considerations may influence lending decisions and recovery efforts.

6.2 Management and Recovery Strategies

The literature examines various strategies employed by banks to manage and recover NPAs, with comparative insights into the effectiveness of different approaches across public and private sector banks.

Provisioning Strategies: Studies analyzing NPA management in public sector banks found that adequate provisioning is essential for absorbing losses and maintaining financial stability [30]. The literature notes that while provisioning is mandated by regulatory norms, banks have some discretion in the timing and extent of provisions beyond minimum requirements. Private sector banks tend to maintain higher provisioning coverage ratios, providing greater buffers against potential losses [1].

Restructuring and Rehabilitation: The literature examines loan restructuring as a strategy for managing stressed assets before they become NPAs. Studies note that restructuring can be effective when borrowers face temporary liquidity problems but have viable underlying businesses [5]. However, research also cautions that excessive or poorly designed restructuring can delay recognition of true NPAs and reduce ultimate recovery rates [12].

Recovery Mechanisms: Studies comparing recovery effectiveness across sectors found that private sector banks demonstrate more aggressive and effective recovery efforts [1]. The literature identifies several

recovery channels, including legal action through Debt Recovery Tribunals (DRTs), asset reconstruction companies (ARCs), and the Insolvency and Bankruptcy Code (IBC) [22]. Research suggests that private sector banks achieve higher recovery rates through these mechanisms, partly due to better documentation and legal preparedness [5].

Write-offs and Sale to ARCs: The literature examines the role of write-offs and sales to asset reconstruction companies in NPA management. Studies note that while write-offs remove NPAs from balance sheets, they represent recognition of losses and do not eliminate the need for recovery efforts [30]. Research on the effectiveness of ARCs in the Indian context presents mixed findings, with some studies suggesting that recovery rates through ARCs are often lower than direct bank recovery efforts [19].

Preventive Strategies: The literature increasingly emphasizes preventive approaches to NPA management, including enhanced credit appraisal, early warning systems, and proactive monitoring [5]. Studies found that private sector banks' superior performance is largely attributable to their preventive strategies rather than superior recovery mechanisms [1]. Research suggests that investing in credit risk management infrastructure and human capital yields higher returns than post-facto recovery efforts.

6.3 Macroeconomic and Regulatory Context

The literature situates the NPA challenge within broader macroeconomic and regulatory contexts, examining how policy interventions and economic conditions shape NPA dynamics.

Regulatory Reforms: Studies examining the impact of regulatory interventions, including the Asset Quality Review (AQR), Insolvency and Bankruptcy Code (IBC), and Prompt Corrective Action (PCA) framework, provide mixed assessments of effectiveness [22]. Research suggests that the AQR, by forcing recognition of hidden NPAs, initially increased reported NPA levels but improved transparency and created pressure for resolution [1]. The IBC is credited with improving creditor rights and accelerating resolution timelines, though implementation challenges remain [22].

Government Recapitalization: The literature examines the role of government capital infusions in supporting public sector banks facing NPA-related capital erosion. Studies analyzing bad loans in public sector banks note that repeated recapitalization efforts, while necessary for maintaining regulatory compliance, may create moral hazard by reducing incentives for prudent risk management [27]. Research suggests that recapitalization should be accompanied by governance reforms and accountability mechanisms to ensure lasting improvements [19].

Economic Growth and Credit Cycles: Studies examining cyclical behavior of NPAs found that credit booms often precede NPA crises, as rapid loan growth during economic expansions leads to deteriorating underwriting standards [13]. The literature suggests that countercyclical prudential policies, including dynamic provisioning and loan-to-value ratio adjustments, could help moderate credit cycles and reduce NPA volatility [27].

Sectoral Policies and Directed Lending: Research examining factors amplifying NPAs in public banks identifies policy-driven lending mandates, including priority sector lending and lending to stressed sectors, as contributing factors [5]. The literature suggests that while these policies serve important social and developmental objectives, they may increase credit risk and require careful design to balance social goals with financial sustainability [19].

COVID-19 Impact and Regulatory Forbearance: Recent studies examining the impact of the COVID-19 pandemic note that moratorium schemes and restructuring packages provided temporary relief but may have masked underlying asset quality deterioration [22]. The literature emphasizes the importance of monitoring asset quality as forbearance measures are withdrawn and assessing the true impact of the pandemic on bank balance sheets.

7. RESEARCH GAPS AND FUTURE DIRECTIONS

Despite the substantial body of literature on NPAs and bank performance in India, several important research gaps remain that warrant further investigation.

Longitudinal Causal Analysis: While the literature consistently documents a negative correlation between NPAs and financial performance, most studies employ cross-sectional or short-panel designs that limit causal inference. Future research employing longer time series, instrumental variable approaches, or natural experiments could provide stronger evidence on causal mechanisms and dynamic relationships [3], [12]. Specifically, research is needed on whether poor performance leads to higher NPAs (through reduced monitoring capacity or risk-taking behavior) or whether NPAs cause performance deterioration, or both operate simultaneously in a reinforcing cycle.

Sector-Specific Recovery Mechanisms: The literature identifies significant differences in NPA levels and recovery rates between public and private sector banks but provides limited granular analysis of specific recovery mechanisms and their differential effectiveness [1], [5]. Future research could examine which specific practices, technologies, or organizational structures explain private sector banks' superior recovery performance, providing actionable insights for public sector bank reform.

Impact of Recent Regulatory Reforms: While some studies mention recent regulatory interventions like the IBC and AQR, comprehensive empirical assessments of their impact on NPA levels, resolution timelines, and recovery rates remain limited [22]. Future research should employ rigorous quasi-experimental designs to evaluate the causal impact of these reforms, distinguishing their effects from concurrent macroeconomic trends.

Heterogeneity Within Sectors: The literature often treats public sector banks and private sector banks as homogeneous groups, but substantial heterogeneity exists within each sector [16], [26]. Future research could examine which specific banks within each sector perform better or worse on NPA management and what factors explain this within-sector variation. Such analysis could identify best practices that could be transferred across institutions.

Microeconomic Mechanisms: While the literature identifies various determinants of NPAs, detailed microeconomic analysis of lending decisions, monitoring practices, and recovery efforts remains limited. Future research employing loan-level data could provide insights into how specific credit appraisal criteria, collateral types, borrower characteristics, and monitoring practices affect default probabilities and recovery rates [19].

Technology and Innovation: The role of technology in NPA management, including credit scoring algorithms, artificial intelligence for fraud detection, and digital recovery mechanisms, is underexplored in the Indian context [16]. Future research could examine how technology adoption affects NPA levels and recovery effectiveness, and whether technology can help close the performance gap between public and private sector banks.

Governance and Incentive Structures: While the literature identifies governance differences between public and private sector banks, detailed analysis of how specific governance mechanisms, compensation structures, and accountability systems affect NPA outcomes is limited [5], [19]. Future research could examine whether specific governance reforms, such as professional boards, performance-linked compensation, or enhanced disclosure requirements, improve NPA management in public sector banks.

Spillover Effects and Systemic Risk: The literature focuses primarily on bank-level impacts of NPAs but provides limited analysis of spillover effects and systemic risk implications [12]. Future research could examine how NPAs in one bank or sector affect credit availability, interest rates, and financial stability more broadly, and whether public sector banks' higher NPA levels create systemic vulnerabilities.

Comparative International Analysis: While this review focuses on India, comparative analysis with other emerging markets facing similar NPA challenges could provide valuable insights [20]. Future research

could examine whether the public-private performance differential observed in India holds in other contexts, and what institutional or regulatory factors explain cross-country variation in NPA management effectiveness.

Long-term Economic Impact: The literature documents that NPAs constrain credit growth and affect economic development, but rigorous quantification of these macroeconomic impacts remains limited [1], [29]. Future research could employ general equilibrium models or regional variation in NPA levels to estimate the causal impact of NPAs on economic growth, employment, and investment.

8. CONCLUSION

This comprehensive literature review synthesizes scholarly research on the impact of Non-Performing Assets on the financial performance of public and private sector banks in India. The evidence overwhelmingly demonstrates a significant negative relationship between NPAs and key financial performance indicators, including Return on Assets (ROA), Return on Equity (ROE), net interest margins, and capital adequacy. This relationship operates through multiple channels: reduced interest income, increased provisioning requirements, constrained lending capacity, and elevated funding costs.

A central finding across the literature is the persistent and substantial performance differential between public and private sector banks. Public sector banks consistently exhibit higher NPA levels, more severe performance deterioration, and lower recovery effectiveness compared to private sector banks. This differential is attributed to weak credit appraisal systems, governance constraints, policy-driven lending obligations, regulatory lapses, and operational inefficiencies in public sector institutions. Private sector banks demonstrate superior performance through stronger risk management practices, more rigorous credit assessment, greater operational autonomy, and more effective recovery mechanisms.

The literature identifies multiple determinants of NPAs operating at macroeconomic, industry, bank-specific, and borrower levels. Macroeconomic downturns, sectoral stress, weak credit appraisal, inadequate monitoring, and willful defaults emerge as key contributors. Management and recovery strategies, including provisioning, restructuring, legal action, and preventive measures, show varying effectiveness across sectors. The regulatory context, including recent reforms like the Asset Quality Review and Insolvency and Bankruptcy Code, has shaped NPA dynamics, though comprehensive impact assessments remain limited.

Despite substantial research progress, significant gaps remain. Future research should employ more rigorous causal identification strategies, examine sector-specific recovery mechanisms in detail, assess the impact of recent regulatory reforms, explore heterogeneity within sectors, analyze microeconomic lending and recovery decisions, investigate the role of technology and innovation, examine governance and incentive structures, assess spillover effects and systemic risk, conduct comparative international analysis, and quantify long-term economic impacts.

As of 2026, the NPA challenge remains a critical concern for Indian banking stability and economic development. While progress has been made in recognition and resolution, particularly through regulatory reforms, the persistent public-private performance gap suggests that structural reforms in public sector bank governance, risk management, and operational practices are essential. Policymakers, regulators, and banking institutions must continue to prioritize NPA management, drawing on the insights from this extensive body of research to design effective interventions that enhance financial sector resilience and support sustainable economic growth.

The path forward requires a multifaceted approach: strengthening credit appraisal and monitoring systems, enhancing governance and accountability in public sector banks, leveraging technology for risk management and recovery, implementing effective regulatory frameworks that balance prudential concerns with credit availability, and addressing the root causes of NPAs including willful defaults and coordination failures. Only through such comprehensive efforts can the Indian banking sector overcome the NPA challenge and fulfill its critical role in financing economic development

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