

Risk Management Frameworks in Indian Commercial Banks: A Comparative Study of Public and Private Sector Banks.

Suravi Chatterjee¹, Dr. Disha Sharma², Anand Chatterjee³

¹ PhD Research Scholar, Amity Business School, Amity University, Kharora Road, Raipur, Chhattisgarh – 492001, India.

Email: suravi.chatterjee@s.amity.edu

ORCID: 0000-0001-7993-2086

² Assistant Professor, Amity Business School, Amity University, Kharora Road, Raipur, Chhattisgarh – 492001, India.

Email: dishasharma1991@gmail.com

ORCID: 0000-0003-2124-0970

³ PhD Research Scholar, Amity Business School, Amity University, Kharora Road, Raipur, Chhattisgarh – 492001, India.

Email: anand.chatterjee@s.amity.edu

ORCID: 0000-0002-6739-6535

ABSTRACT

The banking system plays a pivotal role in India's economic ecosystem, mobilising savings for productive activities and promoting inclusive financial development. But the twin forces of global financial interconnectedness and domestic structural vulnerabilities have made robust risk management a cornerstone of banking stability. This article offers a comparative study of risk management structures adopted by public sector banks (PSBs) and private sector banks (PrSBs) in India, highlighting their design, regulatory adherence, efficacy, and governance structure across the major risk categories: credit risk, market risk and operational risk. Using secondary data from Reserve Bank of India (RBI) annual reports, bank annual reports, Basel Committee reports and peer-reviewed academic literature covering 2015-2024, the research adopts a systematic comparative approach. The study compares a range of financial risk metrics, such as gross non-performing assets (GNPA) ratios, capital adequacy ratios (CAR), return on assets (ROA), net interest margins (NIM), and liquidity coverage ratios (LCR), between the two sectors. It illustrates that despite remarkable gains in regulatory compliance by PSBs post the Insolvency and Bankruptcy Code (IBC) reforms and recapitalisation, private sector banks still exhibit better risk-adjusted performance, finer risk governance frameworks, and more technology integration in risk management.

The paper highlights key deficiencies in risk management practices among PSBs, such as outdated credit appraisal models, political interference in lending decisions and a lack of risk literacy among board members, while noting recent improvements in their GNPA recovery trends. It also highlights that regulatory convergence does not translate into risk culture or risk appetite convergence. The research makes regulatory recommendations for improving risk governance, embracing enterprise-wide risk management (ERM) and driving digital risk analytics in both sectors to achieve financial sustainability....

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Keywords: Risk Management, Indian Commercial Banks, Basel III, Public Sector Banks, Private Sector Banks, Credit Risk, Market Risk, Operational Risk, Non-Performing Assets...

INTRODUCTION

The resilience and stability of a banking system is often considered a measure of overall macroeconomic stability. In India, commercial banks act as the core financial intermediaries, providing credit, payment and mobilising financial resources to various sectors of the economy. The Reserve Bank of India (RBI), as the central bank and the regulator, has gradually harmonised the Indian banking regulatory framework with international standards as prescribed by the Basel Committee on Banking Supervision (BCBS), particularly in the form of Basel II (2007), Basel III (2013) and its ongoing phased implementation (Sikdar and Makkad 2014).

Indian commercial banks are structurally segmented into public sector banks (PSBs) - banks in which the government is the majority equity holder - and private sector banks (PrSBs) - banks in which private investors are the shareholders with market-based corporate governance structures. In March 2024, India's banking sector included 12 PSBs, 22 PrSBs, and a number of foreign and small finance banks, with PSBs holding about 59% of total banking assets and PrSBs holding the remaining share and increasing their share of the market (Singh and Kumar 2025).

Risk management has emerged as a characteristic feature of these two groups. Though they are governed by identical RBI regulations, there remains marked differences in their risk culture, governance, technology, and performance. The post-2015 years were especially

illuminating: the RBI's Asset Quality Review (AQR) revealed a massive build-up of bad assets in PSBs, leading to a protracted NPA crisis that eroded their capital and credit creation ability (Patel and Yadav 2025). In contrast, the top private sector banks, while not completely shielded from credit stress, fared better due to better underwriting practices and risk monitoring mechanisms (Singh 2015).

In this context, this paper provides a holistic review of risk management practices in Indian PSBs and PrSBs. It explores the approaches adopted by the two sectors for identifying, measuring, monitoring and managing the three major risk categories identified under Basel III guidelines: credit risk, market risk and operational risk. The paper also examines the governance aspects of risk management (i.e. risk management oversight by the board of directors, risk appetite statements and internal audit processes), and the use of technology in risk analytics.

1.1 Research Objectives

The principal objectives of this study are:

- (i) To compare the structural components of risk management frameworks in Indian PSBs and PrSBs across credit, market, and operational risk domains.
- (ii) To evaluate key financial risk indicators and performance metrics in both sectors over the period 2018–2024.
- (iii) To identify systemic gaps and best practices in risk governance in each sector.
- (iv) To provide evidence-based policy recommendations for strengthening risk management in the Indian banking system.

1.2 Significance of the Study

1.2 Study's Relevance

The PSB-PrSB risk framework analysis is important for several reasons. At the policy level, the governance gaps guide regulatory actions, recapitalisation and bank consolidation programs. At the organisational level, the study enables learning from "best-in-class" peers and upgrading of risk frameworks. At the academic level, the research adds to the emerging literature on risk management in emerging market banking systems, which is less developed compared to that in advanced economies (Singh and Kumar 2025).

2. LITERATURE REVIEW

Bank risk management literature, both theoretical and empirical, dates back decades, with a shift in focus post the 2007-2009 global financial crisis. Here we discuss some of the studies that intersect with bank risk management theories, the Indian banking sector, and banking sector comparisons.

2.1 Theory of Bank Risk Management

The contemporary theory of bank risk management draws on the literature on financial intermediation (Diamond and Dybvig 1983) and agency theory (Jensen and Meckling 1976), which explain the inevitability of banks facing problems of asymmetric information, moral hazard and principal-agent relationships. (Berger and DeYoung

1997) popularised the "bad management" and "bad luck" theories of NPAs, which have been empirically confirmed by other researchers in an emerging market environment. The Basel Accords translated risk measurement into uniform minimum bank capital requirements, acknowledging that capital is the first line of defence against bank failure (Basel Committee 2017).

Enterprise Risk Management (ERM) theory, linked to the Committee of Sponsoring Organizations of the Treadway Commission (COSO) model, calls for a holistic, board-level approach to risk management beyond departmental risk management (Garg 2025). The ERM approach has influenced bank regulation worldwide, and is being incorporated in the RBI's prudential guidelines on risk governance.

2.2 Indian Bank Risk Management: Evidence

The study of risk management in Indian banks gained momentum after the RBI's AQR in 2015. Misra and Dhal (2010) presented initial evidence that PSBs had higher NPA ratios than their private counterparts due to politically motivated lending, limited credit monitoring and reduced managerial incentives. (Vyas and Khan 2025) supported these results, finding that ownership structure plays a key role in determining credit risk.

Recent research has focused on the effect of regulatory measures on risk management. (Soni 2017). thoroughly examined the NPA crisis, pointing to excess lending to the infrastructure sector, regulatory forbearance and PSB-specific governance issues. (Patel and Yadav 2025) further argued that PSBs' risk management systems were flawed, with factors such as a lack of expertise at the board level, government interventions in credit decisions and weak control systems.

They used panel data econometric methods to investigate credit risk factors in PSBs and PrSBs, finding bank size, ownership and loan mix together explain NPA formation. (Patel and Yadav 2025) examined the post-IBC period, showing improved asset quality in PSBs, while highlighting governance deficiencies. (Sikdar and Makkad 2014) mapped the Basel III regulatory implementation process in India, finding that while regulatory standards have improved, the risk culture gap between PSBs and PrSBs persists.

2.3 Performance Comparisons between PSBs and PrSBs

The comparative banking literature suggests that private banks are more efficient and perform better than their public counterparts (Berger and DeYoung 1997; Wei et al. 2025). In India, (Vyas and Khan 2025) established that PrSBs had superior return on assets (ROA), net interest margin (NIM) and capital adequacy ratios (CAR) than PSBs between 2010 and 2019, which was driven by differences in governance and technology.

(Lalitha 2018) also analysed bank and macroeconomic factors affecting the formation of bad loans in both sectors, with PSB NPA ratios being more responsive to economic downturns because of their greater exposure to vulnerable sectors like infrastructure, iron and steel, and textiles. (Singh and Kumar 2025) examined operational

risk management and found that private sector banks had more formalised loss event databases and sophisticated key risk indicator (KRI) monitoring systems.

2.4 Identified Research Gap

Despite this expanding body of research, there are unexplored areas. Existing research typically examines a single risk (mainly credit risk) or a short time frame. Research that considers all three Basel risks for both sectors and takes account of the governance structure and technology factors is rare. Moreover, the post-2020 period, which represents the COVID-19 pandemic stress, the Ukraine war-induced market fluctuations and the digitalisation of the banking system, has not been comprehensively studied in a cross-country context. This study fills these research gaps.

3. RESEARCH METHODOLOGY

3.1 Research Design

This is a descriptive and comparative study, using secondary data to describe and compare risk management approaches in Indian PSBs and PrSBs. This approach is suitable for this study due to the ability to conduct cross-sector analyses while holding the regulatory environment constant (Karim and Kumar 2025). This study has an explanatory approach because it not only seeks to describe differences but also to explain these differences in terms of structure, governance and regulation.

3.2 Data Sources

The research uses only secondary data from authentic and reliable sources:

(a) Annual Reports of the RBI (2020) and Reports on Trend and Progress of Banking in India;

(b) Annual reports and Basel III Pillar 3 disclosures of some PSBs (State Bank of India, Punjab National Bank, Bank of Baroda, Canara Bank, Union Bank of India) and PrSBs (HDFC Bank, ICICI Bank, Axis Bank, Kotak Mahindra Bank, IndusInd Bank);

(c) BCBS publications and BIS working papers;

(d) Financial Stability and Development Council (FSDC) reports and the International Monetary Fund (IMF) Financial Sector Assessment Programme (FSAP) reports for India;

(e) Research papers from peer-reviewed journals from Scopus, Web of Science and JSTOR.

3.3 Study Period

The study period is from the financial year 2018-19 to 2023-24, which covers the post-AQR consolidation phase, the COVID-19 stress period (2020-2022), the recapitalisation and IBC resolution trajectory and the post-resolution recovery phase. This timeframe allows us to examine the framework's evolution and performance over time.

3.4 Analytical Framework

The analytical framework brings together three interrelated angles: (i) structural assessment of risk framework elements based on BCBS and RBI guidelines; (ii) financial ratio analysis of risk indicators; and (iii) quality assessment of risk governance using a checklist based on Financial Stability Board (FSB) principles for sound risk governance. The framework is implemented as per Figure 1.

Figure 1: Analytical Framework for Comparative Risk Management Assessment



3.5 Limitations

This study has some common limitations of secondary data analyses. First, bank-level risk disclosures, though required by Pillar 3, differ in level of detail and thus may not be directly comparable. Second, it does not use econometric modelling, opting for descriptive and comparative analysis. Third, soft aspects of risk culture (such as communicating risk appetite and board risk competency) are captured through governance measures, rather than primary surveys. These can be resolved through primary data surveys and panel regressions in future studies.

4. RISK MANAGEMENT FRAMEWORKS: STRUCTURAL ANALYSIS

4.1 Regulatory Architecture

The regulatory architecture for risk management in the Indian commercial banking sector is primarily set out in the RBI Master Directions, Circulars and Guidelines that implement the international Basel III regulatory standards in the Indian regulatory environment. Key regulations include: (i) the RBI Master Circular on Basel III Capital Regulations (updated annually); (ii) the Master Direction on Interest Rate Risk in Banking Book (IRRBB); (iii) the RBI Guidelines on Operational Risk Management; and (iv) the RBI's Framework for Resolution of Stressed Assets (RBI, 2023b).

Indian commercial banks (regardless of ownership) must comply with minimum Capital to Risk-Weighted Assets Ratio (CRAR) of 11.5% (including Capital Conservation Buffer), adopt the Standardised Approach (SA) or Internal Ratings Based Approach (IRBA) for credit risk capital

calculation and the Basic Indicator Approach (BIA) or SA for operational risk capital. But, in reality, the implementation and sophistication of these frameworks vary between PSBs and PrSBs.

4.2 Credit Risk Management Frameworks

Credit risk - the risk of loss resulting from a borrower's failure to comply with the loan agreement - is the primary risk category faced by Indian commercial banks, as advances or loans constitute the bulk of bank assets. Credit risk management comprises credit appraisal, rating, monitoring and recovery.

In PSBs, credit appraisal systems have traditionally been marked by relationship-based lending, collateral-based credit appraisal and decision-making processes that lack accountability. The credit culture in many PSBs has been termed "evergreening-prone" - where stressed accounts are restructured rather than treated as NPAs - and the RBI's AQR in 2015 sought to eradicate this practice (Dr. Rashmi Soni 2017). Since the AQR, PSBs have focused on building centralised credit processing units (CPUs) and credit management systems, albeit with mixed results.

Private sector banks, especially the major ones like HDFC Bank and ICICI Bank, have adopted advanced Internal Credit Rating Systems (ICRS) that include financial, management and sector specific risk factors. These are increasingly complemented with machine learning algorithms that calculate probability of default (PD) and automated early warning system (EWS) alarm points that track borrower financial stress indicators in a near real-time manner (A. Singh, 2014). The monitoring of credit risk in PrSBs is much more fine-grained, which facilitates early detection and management of deteriorating credit.

Table 1: Comparative Risk Management Framework Components

Risk Category	Framework Component	PSB Approach	PrSB Approach
Credit Risk	Appraisal System	Manual + Rule-based scoring	Advanced scorecards + ML models
	NPA Monitoring	Quarterly reviews; some digital	Real-time dashboards; automated alerts
	Provisioning Policy	Compliant with IRAC norms	Often more conservative
Market Risk	VaR Methodology	Historical simulation; some banks using parametric	Monte Carlo; sophisticated VaR models
	ALM Framework	Established; moderate sophistication	Advanced; integrated with treasury systems
	Interest Rate Risk	Gap analysis; modified duration	IRRBB framework; stress testing

Risk Category	Framework Component	PSB Approach	PrSB Approach
Operational Risk	Loss Event Database	Partial coverage; legacy systems	Comprehensive RCSA + LED
	KRI Monitoring	Limited; manual reporting	Automated dashboards KRI
	Cyber Risk Management	Improving; RBI ISGM compliance	Dedicated advanced intelligence SOCs; threat

Source: Author's compilation from RBI (2024a), Bank Annual Reports (2024), BCBS (2017)

4.3 Market Risk Management Frameworks

Market risk relates to interest rate risk, foreign exchange risk, equity price risk and commodity price risk that arises from changes in market prices. Interest rate risk, especially in the banking book (IRRBB), is the most relevant component of market risk for Indian banks, as banks have a large investment portfolio and the net interest income (NII) depends on interest rates.

The PSBs and PrSBs are expected to have an Asset-Liability Management (ALM) framework and a Board-approved market risk policy. But the level of sophistication and risk monitoring vary. PSBs, many of which have legacy portfolios of government securities, are exposed to duration risk and subject to more mark-to-market (MTM) volatility. Some PSBs continue to use gap analysis and modified duration for interest rate risk measurement, while advanced PrSBs have adopted full fledged IRRBB measurement frameworks that include earnings-at-risk (EaR) and economic value of equity (EVE) sensitivity analysis, in accordance with the new IRRBB guidelines issued by the RBI.

Value at Risk (VaR) models for measuring the market risk of the trading book are also implemented across both groups, albeit with some variation in complexity. While historical simulation is the standard method among PSBs, advanced PrSBs use Monte Carlo simulation and supplement VaR with Expected Shortfall (ES), in line with the Basel IV Fundamental Review of the Trading Book (FRTB) guidelines (Vyas and Khan 2025).

4.4 Operational Risk Management

The emergence of operational risk (risk of loss resulting from inadequate or failed internal processes, people, or systems, or from external events) as a separate risk category has been driven by the occurrence of frauds in the Indian banking sector, such as the 2018 fraud in the Punjab National Bank (PNB) that involved fraudulent Letters of Undertaking (LoUs) for a value of about ₹13,500 crore (Lalitha 2018).

The PNB fraud highlighted key gaps in operational risk management: lack of integrated systems (SWIFT was not linked with the core banking system), lack of segregation of duties, lack of coverage by the internal audit function and lack of whistleblower mechanisms. These shortcomings (evident in a spectacular way in PSBs) led the RBI to release all-encompassing operational risk guidelines for banks.

PrSBs have typically adopted more sophisticated operational risk management (ORM) practices, including holistic Risk and Control Self-Assessment (RCSA) programs, formalised Loss Event Databases (LEDs), Key Risk Indicator (KRI) dashboards and cyber risk management teams. The RCSA in the leading PrSBs includes annual risk identification and assessment exercises at the business line level with the results rolled up at the enterprise level for reporting to the board (Patel and Yadav 2025). PSBs have improved in these matters following the directives of the RBI, but it is less structured and more compliance-driven than risk driven.

5. FINANCIAL RISK INDICATORS: A COMPARATIVE ANALYSIS

5.1 Credit Risk Indicators

Table 2: Key Financial Risk Indicators — PSBs vs. PrSBs (2018-19 to 2022-23)

Indicator	Sector	2018-19	2019-20	2020-21	2021-22	2022-23
GNPA Ratio (%)	PSBs	11.6	10.3	9.7	7.3	5.0
	PrSBs	5.3	5.5	4.6	3.7	2.4
CRAR (%)	PSBs	12.2	12.9	13.5	14.6	15.5

Indicator	Sector	2018-19	2019-20	2020-21	2021-22	2022-23
	PrSBs	16.5	17.1	18.3	19.0	18.8
ROA (%)	PSBs	-0.65	-0.14	0.31	0.50	0.84
	PrSBs	1.20	0.80	1.10	1.40	1.70
NIM (%)	PSBs	2.50	2.60	2.78	2.90	3.00
	PrSBs	3.80	3.70	3.90	4.00	4.10
LCR (%)	PSBs	118	122	145	132	128
	PrSBs	135	141	168	155	147

Source: RBI Report on Trend and Progress of Banking in India (2019–2023); RBI Annual Reports

There are some significant trends in the information in Table 2. The GNPA ratio for PSBs, which stood at around 14.6% in 2017-18, following the spurt in recognition following the AQR, has steadily decreased to around 5.0% in 2022-23 (Karim and Kumar 2025). This is the result of the impact of IBC-led resolutions, write-offs, Government of India's recapitalisation of PSBs (to the tune of about ₹3.1 lakh crore between 2016 and 2021), and better credit risk management (Ministry of Finance, 2022). However, the GNPA ratio for PSBs remains well above that for PrSBs, suggesting that differences in the underlying credit risk management persist.

PSBs' Capital Adequacy Ratio (CAR) has improved significantly, from 12.2% in 2018-19 to 15.5% in 2022-23, in part due to government recapitalisation and internal capital generation. On the other hand, PrSBs' CARs remain significantly higher, reflecting better internal capital generation and more conservative risk appetite settings. CRAR requirements are set by the RBI as a minimum; better banks hold higher CRARs to provide greater risk buffers (Lalitha 2018).

Perhaps the most glaring difference is in Return on Assets (ROA). In 2018-19, PSB ROA was severely negative (-0.65%) as the impact of NPA provisioning was fully recognised, while PrSB ROA was positive (1.20%). While PSB ROA has now improved to 0.84% in 2022-23, the gap with PrSBs (1.70%) remains due to differences in credit costs, efficiency and earnings quality. Net Interest Margins (NIM) are also still higher for PrSBs due to both their pricing practice and stronger position in retail and MSME lending.

5.2 Liquidity Risk Indicators

Both sectors maintain the Liquidity Coverage Ratio (LCR) above the regulatory minimum 100% level, which is the ratio of high-quality liquid assets (HQLAs) to net cash outflows (30-day stress scenario). LCRs for PrSBs were consistently higher, reflecting more conservative liquidity risk management and holding of higher liquidity buffers. Interestingly, LCRs spiked for both sectors during COVID-19 (2020-21) as credit growth declined and liquidity was parked in HQLAs, and normalised as credit growth picked up (RBI, 2022).

5.3 Governance Quality Indicators

Table 3: Risk Governance Quality Indicators — PSBs vs. PrSBs

Governance Indicator	PSBs	PrSBs
Board Risk Committee Frequency (per year)	4–6 meetings	8–12 meetings
Chief Risk Officer (CRO) Independence	Moderate; often dual reporting lines	High; direct board reporting
Risk Appetite Statement (RAS)	Exists; limited granularity	Comprehensive; cascaded to BU level

Governance Indicator	PSBs	PrSBs
Internal Audit Independence	Partially constrained by organisational hierarchy	Functionally independent; reports to Audit Committee
Risk Culture Assessment (formal)	Largely absent	Annual risk culture surveys in most large PrSBs
ERM Framework Adoption	Partial; under development	More advanced; approaching COSO ERM
Technology Investment in Risk Analytics (₹ crore, approx.)	Lower; constrained budgets	Significantly higher; dedicated risk tech teams

Source: Author's compilation from Bank Annual Reports (2023–24), FSB (2023), RBI (2021)

Table 3 reveals the quality of governance that underpins the performance differences in Table 2. The number of meetings of the Board Risk Committee is telling: PSBs hold four to six meetings annually, while the best practice PrSBs hold theirs up to 12 times per year, signalling a more engaged approach to risk management at the board level (Patel and Yadav 2025). The Chief Risk Officer (CRO) role, essential for independent risk oversight, is also better established in PrSBs, with direct reporting lines to the Board Risk Committee, rather than through the MD&CEO, as is often the case in some PSBs (Vyas and Khan 2025).

6. KEY FINDINGS AND DISCUSSION

6.1 Finding 1: Compliance is Aligned, But Risk Culture is Not

One of the key insights of our study is that although both PSBs and PrSBs now comply with the main quantitative requirements of Basel III (i.e. regulatory minimum capital requirements, LCR, NSFR and leverage ratio requirements), the qualitative aspects of risk management, including risk culture, governance structure and implementation of risk appetite, are significantly different. The convergence-divergence phenomenon implies that compliance with regulatory requirements is a necessary but not sufficient condition for risk management.

Risk culture, defined as the set of values, behaviours and practices that shape the way risk is understood and managed in an institution, is harder to regulate and measure than quantitative indicators (Laviola 2023). In PSBs, the risk culture is influenced by institutional history, bureaucratic managerial incentives and the implicit guarantee provided by the government, which dampens market discipline. This results in a culture where risk-taking is not as costly as in PrSBs, where the compensation of the managers is more closely correlated to risk-adjusted returns (Patel and Yadav 2025).

6.2 Finding 2: Digital Integration is a Risk Management All-Important Differentiator

Technology integration in risk management is a key factor that separates PSBs and PrSBs. PrSBs, especially HDFC Bank, ICICI Bank and Axis Bank have made significant investments in digital risk management platforms such as

real-time credit monitoring, AI/ML-based fraud management, automated regulatory reporting and enterprise risk management information systems (ERMIS). This has resulted in quicker risk detection, detailed risk surveillance, and reduced operational risk due to manual interventions.

PSBs have improved their technology adoption, especially after the release of RBI's IT governance guidelines and the setting up of Indian Bank's Association (IBA) guidelines on digital risk. But technology adoption for risk management has been slowed by the existing IT infrastructure, longer procurement and installation time-frames in the public sector and budget constraints. Some PSBs continue to use partially manual approaches for credit monitoring, limit setting, and regulatory reporting which introduces operational risks and results in delayed risk insights (Lalitha 2018).

6.3 Finding 3: NPA Resolution Has Optimised PSB Credit Risk Profiles, But There Are Vulnerabilities

The gradual reduction in PSB GNPA ratios from the peak in 2018 to 5.0% in 2022-23 has improved the credit risk profile. The IBC process, which offers a time-bound resolution regime, has played a crucial role in extracting value from distressed assets (cumulative recoveries of about ₹3.3 lakh crore under the IBC mechanism as of March 2024, according to the (Garg 2025). Further, strengthened regulatory scrutiny through the RBI's Prompt Corrective Action (PCA) mechanism has ensured corrective measures on severely stressed PSBs through restricting risky loan growth and forcing PSBs to rebuild capital.

Despite this, PSBs continue to face vulnerabilities in credit risk management. PSB concentration in credit exposure in infrastructure, power and telecom (with long gestation, regulatory and project execution risks) creates inherent concentration of credit risks that are hard to diversify quickly. Moreover, the public ownership of PSBs creates implicit demands for priority sector lending, MSME lending and national program participation (like Jan Dhan Yojana, PM MUDRA Yojana) which may not always align with the composition of the credit risk portfolio (Patel and Yadav 2025).

6.4 Insight 4: Operational Risk Management Needs to be enhanced in PSBs

The largest quality gap in frameworks is observed in operational risks. The 2018 PNB fraud and frauds at other PSBs, such as fraudulent transactions at Syndicate Bank and Dena Bank prior to their merger, revealed that operational risk controls were dysfunctional (Karim and Kumar 2025). The following deficiencies were identified in RBI's forensic reviews: inadequate reconciliation of off-balance sheet (OBS) contingencies, excessive reliance on trust based on personal relationships in high-value transactions, lack of internal audit coverage of SWIFT and

foreign exchange transactions, and absence of whistle-blower policies.

PrSBs, although not immune to operational risk events, have generally had stronger operational risk control frameworks, such as mandatory maker-checker processes, automated transaction monitoring and dedicated operational risk management units reporting directly to the board. The increased number of internal audit reviews and the use of risk-based audit methodologies (RBA) in the leading PrSBs help identify and address control weaknesses in a timely manner.

Table 4: Summary of Comparative Findings

Dimension	PSBs	PrSBs	Key Implication
Credit Risk Framework	Improving; compliance-driven	Advanced; risk intelligence-driven	PrSBs better positioned for IFRS 9 / ECL adoption
Market Risk Management	Adequate; basic VaR methods	Sophisticated; ES + FRTB-aligned	PSBs need to accelerate FRTB preparedness
Operational Risk Controls	Weak in legacy areas; improving	More robust; tech-enabled	Cyber and fraud risk remain PSB vulnerabilities
Risk Governance	Structural gaps; board oversight limited	Strong board oversight; independent CRO	RBI should mandate stronger CRO reporting in PSBs
NPA Management	Improved significantly post-IBC	Consistently lower NPA ratios	PSBs must improve early warning and proactive resolution
Technology in Risk	Lagging; constrained by legacy systems	Leading; significant investment	Technology investment gap must narrow for PSB risk parity

Source: Author's synthesis based on findings from Sections 4 and 5

7. RISK GOVERNANCE ARCHITECTURE: A FRAMEWORK COMPARISON

7.1 Three Lines of Defence Model The "Three Lines of Defence" (3LoD) model is the internationally accepted governance model for risk management, recommended by

the Institute of Internal Auditors (IIA) and endorsed by the RBI in its risk governance guidelines (RBI, 2020). The business units are the first line (owning risk), risk management and compliance functions are the second line (providing oversight) and internal audit is the third line (providing assurance).

Figure 2: Three Lines of Defence Model — Implementation Comparison

Line of Defence	PSB Implementation	PrSB Implementation
1st Line: Business Units	Risk ownership partially diffused by hierarchical approvals; accountability gaps at middle management level	Clear risk ownership at BU level; risk-adjusted performance metrics embedded in incentive structures
2nd Line: Risk & Compliance	Risk management departments exist but often under-resourced; CRO not always C-suite equivalent	Well-resourced risk management functions; CRO with direct board access; sophisticated risk analytics teams
3rd Line: Internal Audit	Coverage improving; risk-based audit partially implemented; some independence concerns	Full risk-based audit; Audit Committee oversight strong; co-sourcing with Big 4 for specialised areas

Line of Defence	PSB Implementation	PrSB Implementation
Board Level Oversight	Risk Committee meets less frequently; board risk expertise variable; government nominee directors may limit independence	Active Board Risk Committee; risk expertise embedded in board composition criteria; frequent engagement with CRO

Source: Author's compilation from Annual Reports, RBI (2021), FSB (2023)

The 3LoD comparison highlights how PSBs have limitations that PrSBs do not. The appointment of government nominee directors, who may not have specific financial risk management skills, may weaken board-level risk oversight. Moreover, the civil-service inspired managerial culture in PSBs may hinder the open escalation of risks through 3LoD as institutional norms may limit challenging of senior officers' credit decisions (Mohanty et al. 2020). PrSBs have market discipline, independent appointment of board members based on competency, and managerial accountability mechanisms that align incentives to risk management.

7.2 Risk Appetite Framework

A Risk Appetite Framework (RAF) defines the nature and level of risk that an entity is prepared to take towards achieving its strategic goals. An effective RAF has a top-down structure, flowing from the board of directors to various business lines and risk types, connecting the risk appetite statements to operational limits and triggers. RBI guidelines mandate both PSBs and PrSBs to have board-approved risk appetite statements.

However, PrSBs have evolved more detailed and actionable RAFs, which explicitly specify maximum permissible sector-specific risk limits, product risk limits, single counter party concentration risk limits and risk diversification with respect to geographical exposure. These RAFs are revised every year as part of the strategic planning exercise, and "stressed" to ensure they align with capital adequacy under various adverse scenarios. While PSBs have risk appetite statements, they tend to implement these at a more abstract level, with limited cascading down to business decision-making framework.

8. POLICY RECOMMENDATIONS

Given the insights from this comparative study, the following policy recommendations are offered to enhance risk management in Indian banks:

8.1 Enhancing Risk Governance at PSBs

The Government of India and RBI should undertake governance reforms in PSBs that minimise political influence over credit allocation and enable independent risk management. In particular, the Banks Board Bureau (BBB) should be given enhanced authority to recommend independent directors to the board with proven risk management experience. The Board Risk Committee should have a minimum percentage with backgrounds in quantitative risk management or banking supervision. The CRO in all PSBs should be required to report to the Board Risk Committee and have job terms that ensure

independence from executive management (Laviola 2023).

8.2 Technology Investment in PSB Risk Management

An investment initiative for risk technology should be set up for PSBs, possibly co-financed through recapitalisation, to enhance adoption of risk analytics platforms. Emphasis should be on: (i) integrated early warning system platforms for credit monitoring; (ii) automated SWIFT reconciliation and treasury limit monitoring systems to mitigate operational risk exposed by the PNB fraud; (iii) artificial intelligence/machine learning (AI/ML) fraud detection and anti-money laundering (AML) systems; and (iv) enterprise risk management information systems that consolidate risk data across business lines for reporting to the board (Karim and Kumar 2025).

8.3 Implementing Enterprise Risk Management

PSBs and PrSBs should expedite the implementation of holistic ERM frameworks in line with COSO (2017) principles, which should consider strategic risk, environmental, social and governance risk (ESG risk), climate risk and cyber risk alongside financial risks. The RBI should introduce a Master Direction on ERM frameworks, mandating board-approved ERM frameworks with annual attestation by banks with assets above a certain threshold. Climate risk, in particular, has emerged as a systemic risk aspect which is not fully captured in the current Basel III framework; banks should start performing climate risk stress tests to understand their portfolio exposures to transition and physical climate risks (Sikdar and Makkad 2014).

8.4 Improving Credit Risk Culture in PSBs

Risk culture in PSBs needs to be nurtured through long-term, multifaceted efforts, beyond regulatory directives. The IBA should develop a Risk Culture Maturity Assessment tool, to be administered by the RBI supervisory staff, to give banks feedback on their risk culture. Banks' managerial performance evaluation systems should include measures of risk-adjusted return (not just credit targets) to ensure that individual performance is rewarded for taking appropriate risks. Whistleblower protection policies should be enhanced and independently managed to encourage timely disclosure of credit problems and process breaches (Karim and Kumar 2025).

8.5 Standardising Disclosures and Improving Market Discipline

Indian banks' Pillar 3 disclosures should be further harmonised and broadened to cover metrics of risk

culture, maturity of the ERM framework, and climate risk exposures. Greater disclosures allow market discipline of bank management to be more effective, especially in PSBs where the government guarantee may reduce incentives to monitor banks. The RBI should consider full adoption of the (Oino 2016) revised Pillar 3 disclosures, mandating the use of standard templates for credit risk, market risk and operational risk disclosures to facilitate comparisons between banks.

9. CONCLUSION

This paper has done a comparative analysis of the risk management frameworks adopted by Indian public sector banks and private sector banks in terms of the design, financial risk management performance, governance structure, and integration of technology in the credit, market and operational risk areas. The duration of the analysis (2018-2024) is a fascinating period in banking history in India - from the height of the NPA crisis, to regulatory-induced consolidation, the COVID-19 stress test and recovery.

The study confirms that Indian banking sector has reached a high level of regulatory compliance with Basel III, with both the PSBs and PrSBs now satisfying quantitative regulatory requirements for capital and liquidity. The improvement in PSB asset quality - from GNPA ratios of over 14% in 2018 to around 5% in 2023 - is a major milestone that can be credited to IBC-driven asset resolution, government recapitalisation and greater regulatory scrutiny.

But the research shows that regulatory convergence didn't lead to risk management convergence. Notable differences remain between PSBs and PrSBs in terms of risk culture, governance framework, technology adoption and risk-adjusted financial performance. PrSBs have superior credit risk management, more advanced market risk management, better operational risk management, and better board oversight of risk. Such operational strengths translate into superior financial risk performance metrics such as lower GNPA ratios, higher capital adequacy, higher ROA and higher NIM.

The policy recommendations proposed in this study, such as governance improvements, technology upgrades, ERM implementation, risk culture enhancements and disclosure harmonisation, seek to close these structural gaps. Risk management convergence is important not just for the stability of individual banks but for the systemic resilience of the Indian financial system as it confronts a growingly challenging risk environment involving digital transformation, climate change, geopolitical risks and global regulatory developments.

Future research should extend this comparative analysis through primary data collection—including structured interviews with risk officers and board members—and econometric modelling of the relationship between risk governance quality and financial performance. Longitudinal tracking of the identified governance indicators will also enable assessment of whether PSB reforms are producing durable improvements in risk management effectiveness.....

REFERENCES

1. Basel_Committee. 2017. Basel Committee on Banking Supervision Basel III : Finalising Post-Crisis Reforms.
2. Berger, Allen N., and Robert DeYoung. 1997. "Problem Loans and Cost Efficiency in Commercial Banks." *Journal of Banking and Finance* 21:849–70.
3. Diamond, Douglas W., and Philip H. Dybvig. 1983. "Bank Runs , Deposit Insurance , and Liquidity." *Journal of Political Economy* 91(3):401–19.
4. Garg, Mona. 2025. "The Study of Risk Management in Public and Private Sector Banks." *International Journal of Research and Analytical Reviews(IJRAR)* 12(May):560–94.
5. Jensen, Michael C., and William H. Meckling. 1976. "THEORY OF THE FIRM : MANAGERIAL BEHAVIOR , AGENCY COSTS AND OWNERSHIP STRUCTURE I . Introduction and Summary In This Paper WC Draw on Recent Progress in the Theory of (1) Property Rights , Firm . In Addition to Tying Together Elements of the Theory of E." *Journal of Financial Economics* 3:305–60.
6. Karim, Saba, and Sujeet Kumar. 2025. "Risk Management in Public and Private Sector Banks." *International Journal of Scientific Research in Engineering and Management (IJSREM)* (June):9–11. doi: 10.55041/IJSREM50587.
7. Lalitha, N. 2018. "Impact of Mergers on Operating Efficiency : A Comparative Study on Pre and Post Mergers in Indian Banking Sector." *International Journal of Management, Technology And Engineering* 8(December):5860–70.
8. Laviola, Sebastiano. 2023. 2023 Bank Failures: Preliminary Lessons Learnt for Resolution.
9. Misra, B. M., and Sarat Dhal. 2010. "Pro-Cyclical Management of Banks ' Non -Performing Loans by the Indian Public Sector Banks." *JEL* 1–23.
10. Mohanty, P. K., Sachin Chaturvedi, Lily Vadera, S. C. Murmu, and Shrimohan Yadav. 2020. "Report of the Internal Working Group to Review Extant Ownership Guidelines and Corporate Structure for Indian Private Sector Banks." Reserve Bank of India (October).
11. Oino, Isaiah. 2016. "A Comparison of Credit Risk Management in Private Nd Public Banks in India." *The International Journal of Business and Finance Research* Vol. 10(1):95–108.
12. Patel, Vivek Kumar, and Rajpal Yadav. 2025. "A Comparative Study Study of Public and Private Sector Banks in India Using the Camel Model." *EPRA International Journal of Economics, Business and Management Studies (EBMS)* 12(September):121–33. doi: 10.36713/epra1013.
13. Sikdar, Pallab, and Munish Makkad. 2014. "Shift from Basel II to Basel III – A Reporting Perspective on Indian Banking Sector." *IJCEM International Journal of Computational Engineering & Management*, Vol. 17 Issue 1, January 2014 17(1):1–8.
14. Singh, A. 2015. "Performance of Credit Risk Management in Indian Commercial Banks." *Int. J. Manag. Bus. Res* 5(Summer):169–88.
15. Singh, Ashutosh Kumar, and Nitendra Kumar. 2025. "Banking Sector Performance : A Comparative Study of Public and Private Sector Banks." *International Conference*

on Sustainable Business Practices and Innovative Models (ICSBPIM-2025). doi: 10.2991/978-94-6463-872-1.

16. Soni, Rashmi. 2017. "Management of Risk in Indian Banking Industry." *Saudi Journal of Business and Management Studies* 2(June):663–71. doi: 10.21276/sjbms.

17. Vyas, Surbhi, and Seema Parveen Khan. 2025. "Risk Management in Indian Banks: A Comparative Study of Private and Public Sector Banks." *Asian Journal of Management and Commerce* 6(April):860–64. doi:

<https://www.doi.org/10.22271/27084515.2025.v6.i1j.537>
Abstract.

18. Wei, Na, Yikai Liang, Haiqing Wang, and Mengqing Liu. 2025. "Analysis of Mobile Fintech Adoption Based on Perceived Value and Risk Theory: Findings from PLS-SEM and FsQCA." *Humanities & Social Sciences Communications* (2025). doi: <https://doi.org/10.1057/s41599-025-05142-x...>