

Financial Risk Management in India: Trends, Challenges, and Strategies (2015–2024)

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Abstract—Financial risk management has emerged as one of the most critical pillars of India’s economic and banking stability, particularly in the decade spanning 2015–2024. This paper investigates the evolution, effectiveness, and implications of financial risk management practices across India’s financial ecosystem, covering banking, capital markets, corporate finance, and monetary policy. Using secondary data from the Reserve Bank of India (RBI), International Monetary Fund (IMF), World Bank, and Securities and Exchange Board of India (SEBI), the study examines the dynamics of credit risk, market risk, liquidity risk, and operational risk. Over the last decade, India has experienced significant macroeconomic events, including demonetization (2016), the implementation of the Goods and Services Tax (2017), the COVID-19 pandemic (2020–2022), and ongoing global inflationary pressures (2022–2024). This paper applies a mixed-method approach—combining quantitative trend analysis with qualitative policy evaluation—to assess how Indian financial institutions adapted their risk management frameworks. The findings reveal that although regulatory frameworks such as Basel III and risk-based supervision by the RBI strengthened systemic resilience, challenges remain in credit quality, digital risk exposure, and ESG compliance. The study concludes with policy recommendations emphasizing the need for integrated risk management systems, technological adoption, and enhanced regulatory coordination to support India’s ambition of sustainable financial stability.

I. INTRODUCTION

Financial risk management has transitioned from a peripheral consideration to a central component of India’s financial architecture. The decade between 2015 and 2024 has been transformative for India’s economy, marked by both internal reforms and external shocks. The global financial environment has become more volatile, characterized by heightened uncertainty due to trade disruptions, technological

change, and geopolitical instability. Within this context, the ability of India’s financial system to identify, measure, and mitigate risks has determined its capacity for sustainable growth.

India’s financial system comprises a diverse set of actors: commercial banks, non-banking financial companies (NBFCs), cooperative banks, insurance firms, capital market intermediaries, and fintech institutions. Each of these sectors faces unique risk exposures—credit risk from non-performing assets (NPAs), liquidity risk from short-term funding imbalances, market risk due to interest rate and exchange rate volatility, and operational risk linked to digitalization and cyber threats. Over the last decade, systemic risks in India were significantly influenced by both domestic factors—such as structural banking issues and policy reforms—and global conditions, including commodity price fluctuations and U.S. monetary tightening.

The Indian government and regulatory institutions have implemented several strategic measures to enhance the resilience of the financial system. Post-2015, the introduction of the Insolvency and Bankruptcy Code (IBC) in 2016, Basel III adoption, and the Financial Stability and Development Council (FSDC) initiatives have collectively aimed to mitigate credit and operational risks. Furthermore, the RBI’s tightening of non-performing loan recognition norms and the establishment of risk-based supervision frameworks have helped improve risk culture among Indian banks.

The significance of financial risk management extends beyond institutional profitability; it underpins macroeconomic stability and investor confidence. The period from 2015–2024 witnessed major transitions such as the demonetization policy of 2016, the economic slowdown in 2019, and the unprecedented disruption of COVID-19. Each of these events tested

India's financial risk preparedness. The post-pandemic years have seen an accelerated shift toward digital banking and fintech-led risk mitigation mechanisms, driven by data analytics, AI-based credit scoring, and regulatory sandboxes.

This study seeks to answer three primary research questions:

1. How have financial risks evolved in India from 2015 to 2024?
2. What has been the role of regulatory reforms and institutional frameworks in managing these risks?
3. What future strategies are necessary to strengthen financial risk management in India?

II. LITERATURE REVIEW

Financial risk management (FRM) has evolved as an indispensable domain of study within the field of finance, particularly after the 2008 global financial crisis. The literature on FRM in India between 2015 and 2024 reflects a growing emphasis on risk-based regulation, systemic stability, and the adoption of technology in financial supervision.

2.1 Theoretical Foundations

Modern financial risk management builds upon the Markowitz Portfolio Theory (1952), Capital Asset Pricing Model (Sharpe, 1964), and the Value-at-Risk (VaR) framework (Jorion, 2007). These models formalized quantitative approaches to measure and mitigate financial exposures. In the Indian context, however, risk management historically emphasized credit control and prudential regulation rather than sophisticated portfolio optimization. Post-liberalization reforms in the 1990s laid the groundwork for adopting international norms such as Basel II and Basel III, aligning Indian banking with global standards.

2.2 Post-2015 Regulatory and Institutional Developments

According to the Reserve Bank of India's *Financial Stability Reports* (2015-2024), risk management frameworks underwent significant strengthening after the introduction of the Insolvency and Bankruptcy Code (IBC) in 2016. The IBC improved credit discipline and recovery efficiency, thereby reducing systemic credit risk. Studies by Ghosh (2019) and

Narain (2021) found that risk-weighted asset ratios improved for scheduled commercial banks, demonstrating the effectiveness of capital-adequacy norms.

The Basel III implementation phase (2015-2019) required Indian banks to raise Tier-I capital, strengthen liquidity coverage ratios (LCR), and adopt stress-testing models. Literature by Joshi & Kumar (2020) highlighted that these reforms enhanced the solvency of public-sector banks but also constrained lending during periods of liquidity stress.

2.3 Non-Performing Assets and Credit Risk

Credit risk remains a central concern. From 2015 to 2018, India witnessed rising NPAs, peaking near 11.2 percent of gross advances. Scholars such as Sengupta & Vardhan (2017) linked this to aggressive infrastructure lending and governance deficiencies. The RBI's *Asset Quality Review (AQR)* forced recognition of hidden stress, and subsequent resolution mechanisms such as the IBC and SARFAESI Act revisions helped reduce NPAs to around 3.2 percent by 2024.

Research by Patnaik & Shah (2022) also examined credit-risk transmission to capital markets, finding that post-COVID credit guarantees and liquidity infusions mitigated contagion effects on NBFCs and mutual funds.

2.4 Market and Liquidity Risks

Market risk in India has been shaped by volatile global capital flows. Studies by Banerjee (2020) show that the introduction of inflation-targeting under a flexible exchange-rate regime enhanced monetary policy credibility and reduced interest-rate volatility. However, liquidity shocks—especially during the 2018 IL&FS crisis and the 2020 pandemic—revealed structural weaknesses in short-term funding markets.

2.5 Operational and Technological Risks

The emergence of digital banking and fintech has expanded the literature on operational and cyber risk. Bansal (2023) highlights the rising incidence of data breaches and payment-fraud risks, calling for integrated risk-governance frameworks. The RBI's *Digital Payment Security Controls* (2021) and *Cybersecurity Framework for Urban Cooperative Banks* (2022) indicate a regulatory shift toward technology-driven resilience.

2.6 Synthesis

The literature converges on three points: (1) India’s regulatory architecture has matured substantially; (2) risk measurement practices have improved through technology and analytics; and (3) persistent vulnerabilities remain in governance, credit underwriting, and digital-risk oversight. This sets the stage for the empirical analysis of trends between 2015 and 2024 undertaken in this paper.

III. METHODOLOGY

3.1 Research Design

This study adopts a mixed-methods design, integrating quantitative trend analysis with qualitative policy evaluation. Quantitative analysis captures macro-financial indicators over 2015–2024, while qualitative assessment interprets regulatory responses and institutional behavior.

3.2 Data Sources

Secondary data were compiled from authoritative sources:

- Reserve Bank of India (RBI): Statistical Tables Relating to Banks in India, Financial Stability Reports.
- International Monetary Fund (IMF): World Economic Outlook Database.
- World Bank: World Development Indicators.
- SEBI and NSE: Market volatility and liquidity indices.
- Ministry of Finance: Economic Surveys (2015–2024).

3.3 Variables and Indicators

- Credit Risk: Gross NPA Ratio, Provision Coverage Ratio, Capital-to-Risk Weighted Assets Ratio (CRAR).
- Market Risk: Nifty Volatility Index (VIX), 10-year G-Sec yield volatility, exchange-rate fluctuations.
- Liquidity Risk: Liquidity Coverage Ratio, call-money market rates, NBFC funding spreads.
- Operational Risk: Number of reported cyber incidents in banks, digital transaction fraud values.

3.4 Analytical Approach

The analysis involves:

1. Trend Analysis (2015–2024) of macro-financial indicators to observe temporal shifts.
2. Correlation Analysis to determine relationships between regulatory variables (e.g., capital adequacy) and risk outcomes.
3. Policy Review of RBI guidelines, Basel III progress reports, and parliamentary committee findings.
4. Comparative Evaluation between pre- and post-COVID periods to assess resilience.

3.5 Limitations

The study relies on secondary data, which may contain reporting lags or revisions. Additionally, risk metrics differ across sectors, limiting perfect comparability. Nevertheless, triangulating multiple sources enhances reliability and validity.

IV. DATA ANALYSIS AND RESULTS

This section analyzes ten years of data (2015–2024) on key financial risk categories in India — credit risk, market risk, liquidity risk, and operational risk. The analysis uses annual data from the RBI, IMF, and World Bank, focusing on how India’s financial risk profile evolved amid structural reforms, global volatility, and technological transformation.

4.1 Credit Risk Trends (2015–2024)

Credit risk—measured primarily through the gross non-performing asset (GNPA) ratio—was one of India’s most significant financial challenges between 2015 and 2020. The NPAs in scheduled commercial banks rose sharply after the RBI’s *Asset Quality Review (AQR)* in 2015–2016 exposed hidden stress.

Table No. 1

Year	Gross NPA (%)	PCR (%)	CRAR (%)
2015	4.3	45.0	12.9
2016	7.5	48.3	13.0
2017	9.3	52.4	12.7
2018	11.2	54.8	13.1
2019	9.1	60.5	13.9
2020	7.5	65.4	14.8

Year	Gross NPA (%)	PCR (%)	CRAR (%)
2021	6.0	68.1	15.8
2022	5.0	70.5	16.2
2023	3.9	72.3	16.9
2024	3.2	74.0	17.3

Interpretation:

- The GNPA ratio peaked at 11.2% in 2018 due to the recognition of large corporate defaults (notably in power, infrastructure, and steel sectors).
- From 2019 onward, gradual improvement occurred through the Insolvency and Bankruptcy Code (IBC) and recapitalization of public sector banks.
- The Provision Coverage Ratio (PCR) improved from 45% in 2015 to 74% in 2024, indicating enhanced loss absorption.
- The Capital-to-Risk Weighted Assets Ratio (CRAR) also rose steadily, reflecting better capital adequacy.

Key Insight: Post-IBC and Basel III compliance significantly strengthened the credit-risk framework, though small and medium enterprises (SMEs) remained vulnerable to credit shocks.

4.2 Market Risk Dynamics

Market risk pertains to exposure from changes in interest rates, stock prices, and exchange rates. India’s market risk profile over 2015–2024 reflects global macroeconomic shifts, domestic monetary policy reforms, and the rise of retail participation in financial markets.

Table No. 2

Year	NIFTY VIX (avg.)	10-year G-Sec Yield Volatility (%)	INR/USD Volatility (%)
2015	17.8	5.4	4.2
2016	18.6	5.8	4.8
2017	14.3	5.2	3.9
2018	17.1	6.0	5.0
2019	16.8	5.5	4.6
2020	33.4	9.3	7.5
2021	22.0	6.7	5.2
2022	18.5	7.2	5.6
2023	16.0	5.9	4.8
2024	15.4	5.1	4.3

Interpretation:

- Market volatility spiked during COVID-19 (2020) due to global uncertainty and capital outflows, doubling the NIFTY VIX average.
- The adoption of inflation-targeting (4% ±2%) under the Monetary Policy Framework Agreement (2016) improved inflation expectations and stabilized bond markets post-2021.
- Exchange-rate volatility has moderated since 2022, aided by record foreign exchange reserves (~\$600 billion).

Key Insight: Market risks are increasingly being mitigated through monetary-policy credibility and diversified investor participation, though global spillovers still pose challenges.

4.3 Liquidity Risk Patterns

Liquidity management emerged as a major concern, especially for NBFCs (Non-Banking Financial Companies). The IL&FS crisis of 2018 exposed liquidity mismatches, while the COVID-19 lockdowns caused a sharp fall in cash flows across sectors.

Table No. 3

Year	LCR (%)	Call Money Rate Volatility (%)	NBFC Funding Spread (bps)
2015	102	1.3	85
2016	105	1.5	90
2017	107	1.6	95
2018	110	2.5	160
2019	112	2.2	135
2020	130	3.8	190
2021	125	2.5	150
2022	122	1.9	130
2023	118	1.8	110
2024	115	1.6	95

Interpretation:

- The Liquidity Coverage Ratio (LCR) remained above the 100% regulatory minimum, showing robust systemic liquidity buffers.
- Spreads widened sharply in 2018–2020 due to NBFC stress and pandemic-induced market freeze.
- RBI’s Targeted Long-Term Repo Operations (TLTROs) and moratorium packages stabilized liquidity conditions post-2020.

Key Insight: Liquidity risk management improved after 2020 due to central-bank interventions and better asset-liability management by financial institutions.

4.4 Operational and Technological Risks

The surge in digital transactions and fintech penetration increased operational vulnerabilities. Between 2015 and 2024, India’s digital payment volume grew over 10x, but so did cyber incidents.

Table No. 4

Year	Cyber security Incidents (RBI-reported)	Digital Payment Value (₹ trillion)
2015	13,000	25
2016	18,000	32
2017	22,000	57
2018	28,000	84
2019	35,000	115
2020	50,000	150
2021	60,000	210
2022	65,000	260
2023	72,000	310
2024	78,000	350

Interpretation:

- The Unified Payments Interface (UPI) revolutionized India’s payment ecosystem, increasing transaction volume exponentially.
- However, the same digital expansion created new operational risks in cybersecurity and fraud.
- RBI’s *Cybersecurity Framework (2021)* and *Digital Payment Security Controls (2022)* reduced fraud loss ratios by 2024.

Key Insight: Operational risk management now depends on cybersecurity architecture, fintech oversight, and AI-driven fraud detection systems.

V. SUMMARY OF FINDINGS

Risk Category	2015–2018 Trend	2019–2021 Trend	2022–2024 Trend	Outcome
Credit Risk	Rising NPAs; weak capital buffers	Stabilization due to IBC	Steady improvement	Stronger balance sheets
Market Risk	Moderate volatility	High volatility (COVID-19)	Stabilizing	Improved monetary policy transmission

Risk Category	2015–2018 Trend	2019–2021 Trend	2022–2024 Trend	Outcome
Liquidity Risk	Stable	NBFC crisis; liquidity crunch	Adequate liquidity	Better RBI coordination
Operational Risk	Growing fintech exposure	Pandemic cyber threats	Cyber resilience improving	More robust digital framework

Overall Interpretation: The data confirm that India’s financial risk landscape between 2015 and 2024 underwent significant transformation. Systemic risk declined due to reforms like the IBC, Basel III implementation, and digital oversight frameworks. The pandemic served as a stress test that revealed the strength of India’s risk governance mechanisms.

5.1 Market Risk and Monetary Policy Credibility

The stabilization of market risk indicators after 2021 underscores the credibility of India’s inflation-targeting framework and improved communication by the Monetary Policy Committee (MPC). According to modern monetary theory, stable inflation expectations reduce interest rate volatility and asset price distortions, thereby mitigating systemic market risk. During the pandemic, however, India faced the classical “policy trilemma”: maintaining exchange rate stability, controlling inflation, and allowing capital mobility. The RBI’s calibrated interventions—foreign exchange accumulation, targeted liquidity infusions, and open-market operations—demonstrated effective macroprudential management. The steady decline of the NIFTY VIX from 33.4 in 2020 to 15.4 in 2024 suggests restoration of investor confidence and market equilibrium.

Nonetheless, India’s market risk remains linked to global events, including U.S. interest-rate cycles and oil price volatility. The next decade may thus require enhanced use of financial derivatives, hedging mechanisms, and real-time market analytics to mitigate external shocks.

5.2 Liquidity Risk and Systemic Stability

The IL&FS crisis of 2018 was a watershed moment for liquidity management in India. It exposed structural mismatches in NBFC funding models, highlighting deficiencies in liability management and regulatory oversight. The RBI’s subsequent measures—such as tighter supervision, enhanced disclosure norms, and

liquidity stress testing—represent the application of systemic risk theory, which emphasizes interconnectedness among financial entities.

During the COVID-19 pandemic, liquidity support through TLTROs, moratoria, and refinancing facilities prevented a credit freeze. The data show that while liquidity volatility increased in 2020, RBI interventions effectively normalized it by 2022. This period validates the Keynesian view that proactive central-bank liquidity support is essential during crises to prevent systemic contagion.

Moving forward, liquidity management will need to integrate fintech lending platforms and digital NBFCs into the regulatory perimeter to ensure system-wide stability.

5.3. Operational and Technological Risks in the Digital Era

India's transition to a digital-first economy has redefined operational risk. With over 350 trillion INR in annual digital payment value (2024), the threat surface for cyberattacks and fraud has expanded. The rise in cyber incidents aligns with global trends reported by the Bank for International Settlements (BIS), which warns that cyber risk has become a macro-financial risk.

The RBI's establishment of the Cybersecurity Framework for Banks (2021) and the Digital Payment Security Controls (2022) marks a shift from compliance-based oversight to resilience-based regulation. This approach aligns with enterprise risk management (ERM) theory, emphasizing proactive identification and continuous monitoring of digital vulnerabilities.

Fintech integration also introduces third-party risk—dependence on cloud providers, data aggregators, and payment gateways. Thus, future operational-risk frameworks must adopt zero-trust cybersecurity models and AI-driven anomaly detection systems to safeguard financial integrity.

5.4 Integrated Risk Governance

A key insight from 2015–2024 is that risk management cannot be siloed. The interdependence between credit, market, liquidity, and operational risks necessitates integrated risk governance. The Financial Stability and Development Council (FSDC) has played a pivotal role in macroprudential coordination among the RBI, SEBI, IRDAI, and PFRDA.

The data show that systemic resilience improved because of cross-regulatory collaboration—Basel III capital norms, SEBI's risk-based margining, and IRDAI's solvency frameworks collectively reduced contagion channels. According to risk interdependence theory, when one risk type amplifies, others can propagate through feedback loops. Therefore, integrated supervision ensures early identification and containment of risks across sectors.

5.5 ESG and Emerging Risks

Between 2022 and 2024, environmental, social, and governance (ESG) considerations began influencing credit ratings and investment flows. Financial institutions in India are gradually incorporating climate risk into their risk-assessment models. The RBI's *Discussion Paper on Climate Risk and Sustainable Finance (2022)* marks the beginning of ESG-linked risk governance.

Emerging risks—such as climate-induced credit defaults, carbon-transition risks, and social-compliance failures—are likely to redefine FRM in India. By integrating climate stress testing, green taxonomy frameworks, and sustainability disclosures, Indian regulators can align with the global shift toward responsible finance.

5.6 Summary of the Discussion

1. Regulatory Reforms Matter: IBC, Basel III, and RBI risk-based supervision significantly reduced systemic vulnerabilities.
2. Technological Resilience Is Key: Cybersecurity and digital-risk management now form the backbone of operational resilience.
3. Policy Coordination Works: Macroprudential bodies improved overall financial stability.
4. New Risks Are Emerging: ESG and fintech risks are reshaping the risk management paradigm.

VI. CONCLUSION AND POLICY RECOMMENDATIONS

The decade from 2015 to 2024 represents one of the most dynamic periods in India's financial history. The findings of this paper demonstrate that India has made substantial progress in strengthening its financial-risk-management framework through regulatory reform, capital augmentation, and technological modernization. Credit risk, which dominated policy

concern in the mid-2010s, has been mitigated by legal innovations such as the Insolvency and Bankruptcy Code (IBC) and recapitalization of public-sector banks. Market volatility has been tempered by credible monetary policy and improved communication through the Monetary Policy Committee (MPC). Liquidity resilience has been ensured by proactive central-bank operations, while operational risk is increasingly managed through cybersecurity architecture and data-governance frameworks.

6.1 Key Conclusions

1. **Systemic Stability Improved:** The average GNPA ratio declined from 11.2 percent in 2018 to 3.2 percent in 2024, confirming that risk-management reforms had tangible outcomes.
2. **Market Confidence Restored:** Post-COVID monetary and fiscal coordination revived investor sentiment, stabilizing equity and bond markets.
3. **Digital Transformation Accelerated:** India's fintech ecosystem enhanced efficiency but simultaneously demanded stronger cyber-risk governance.
4. **Regulatory Maturity Achieved:** Coordination among the RBI, SEBI, IRDAI, and FSDC has institutionalized macroprudential oversight.
5. **Emerging Risks Ahead:** Climate change, ESG compliance, and algorithmic trading introduce new layers of systemic exposure.

6.2 Policy Recommendations

1. **Integrate Climate and ESG Risk:**
 - Incorporate *climate-stress testing* into banking supervision.
 - Develop a green-taxonomy for asset classification and disclosure.
 - Encourage issuance of green bonds and sustainability-linked loans.
2. **Enhance Digital-Risk Resilience:**
 - Implement AI-based threat-detection systems and real-time fraud-monitoring tools.
 - Mandate periodic cybersecurity audits for all regulated entities.
 - Expand data-localization norms and privacy safeguards under India's Digital Personal Data Protection Act (2023).
3. **Strengthen MSME and NBFC Risk Management:**

- Promote credit-guarantee schemes and AI-driven credit scoring to reduce information asymmetry.
 - Extend Basel-style capital requirements to large NBFCs.
4. **Develop Integrated Risk Dashboards:**
 - The RBI and FSDC should deploy unified data platforms for early-warning indicators across credit, market, and liquidity dimensions.
 5. **Promote Risk-Culture and Governance:**
 - Financial institutions must embed risk culture through board-level Chief Risk Officer mandates, training programs, and performance-linked risk metrics.
 6. **Encourage Academic-Regulatory Collaboration:**
 - Partnerships between universities, think tanks, and regulators can foster empirical research and evidence-based policymaking.

6.3 Future Outlook

Looking beyond 2024, India's risk-management architecture must evolve toward predictive analytics and integrated supervision. The interplay between global monetary tightening, climate transitions, and digitalization will define the next generation of risks. A forward-looking framework—anchored in data science, governance ethics, and sustainable finance—will be essential to achieving India's aspiration of becoming a \$5-trillion, risk-resilient economy.

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