

Fintech Adoption And Financial Risk Management: Evidence From Indian Nbfcs

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Abstract

The digitisation of financial services has greatly changed the way Non-Banking Financial Companies (NBFCs) operate and manage risk in India. Financial Technology (FinTech) such as artificial intelligence (AI), machine learning, big data analytics, digital lending platforms, regulatory technology (RegTech), cloud computing and application programming interfaces (API) provides new capabilities that enhance financial decision-making and risk governance. This study explores the impact of FinTech on the financial risk management of Indian NBFCs and critically looks into the new risks arising from technology based financial intermediation. It is a conceptual and analytical research design which uses secondary data from Reserve Bank of India (RBI) reports and directions, Basel Committee publications, peer-reviewed literature and other relevant institutional sources. The analysis shows that FinTech can boost the credit-risk assessment, liquidity monitoring, operational controls and fraud detection, and regulatory compliance processes with predictive analysis, automation and real-time information processing. The study, however, shows a ‘FinTech–risk management paradox’: digitalisation can help mitigate traditional financial and operational risks, but can also give rise to or exacerbate cyber security, data-privacy, algorithmic, model, third party and technology-concentration risks. The paper thus suggests that, the adoption of FinTech should not be interpreted as a risk reduction but rather a risk transformation process. It further highlights the importance of the integration of FinTech within enterprise-wide risk-management systems, better governance in the board level regarding technology, model validation, model explainability and cyber resilience, and effective oversight of FinTech and Lending Service Providers relationships. The study calls for a balanced framework comprising of a combination of technological innovation, proportionality in regulation, consumer protection, managerial accountability and financial stability for the implementation of sustainable FinTech in the Indian NBFCs.

Keywords: FinTech adoption; NBFCs; financial risk management; digital lending; artificial intelligence; RegTech; cybersecurity; India

1. Introduction

Financial services have undergone a radical digitalisation that is changing how financial systems are constructed and operate today. The Financial Technology (FinTech), which includes technologies like Artificial Intelligence (AI), Machine Learning, big-data analytics,

Cloud Computing, Application Programming Interfaces (APIs), digital lending platforms, and Regulatory Technology (RegTech), is rapidly changing the way financial intermediation and decision-making is conducted in financial institutions. Digital technologies help financial institutions to automate processes, analyse vast amounts of data, enhance customer access and improve risk assessment and monitoring. The partnership and cooperation between banks and non-banking financial companies (NBFCs), FinTechs, and BigTechs are now an essential element of financial innovation in India, as noted by the Reserve Bank of India (RBI, 2024a). Gen-Zedtech is helping to enhance customer service, streamline business operations and mitigate risk, and digital public infrastructure is enabling the digital revolution of platform-based lending and embedded finance. Likewise, the Basel Committee on Banking Supervision (BCBS, 2024) acknowledge that digitalisation is changing the financial-services value chain via Artificial Intelligence (AI) and machine learning, APIs, cloud computing and technologically enabled third-party service providers.

NBFCs play a significant role in the financial system of India as they are complement to banks and provides credit facilities to small businesses, house-holds and borrowers of the society whose financial needs are not being met through the conventional banking system on a regular basis. The sector has now become a part of the Indian financial system and its credit ratio with GDP has risen over time (Harsh et al., 2024). Non-bank retail lenders are also known around the world as important sources of financing to both consumers and small and medium-sized enterprises (SMEs) (Ehrentraud et al., 2024). Digital lending and fintech collaborations and data-based credit assessment are also transforming lending in India for NBFCs. Importantly, according to RBI survey (2024b) on digitisation of NBFCs, operational efficiency, and enhancement of risk management and compliance were among the key factors that led to digitisation of NBFCs.

However, for all its good points, FinTech adoption poses a huge risk management paradox. Technologies that enhance the credit assessment, predictive monitoring, fraud detection and operational efficiency also offer the potential to heighten vulnerability to cybersecurity risk, data-privacy concerns, model risk, technology concentration and dependence on third-party service providers. The RBI (2024b) highlights cybersecurity, data privacy, vendor and third-party risks as key issues with financial digitalisation, with growing connectedness potentially impacting financial stability. Therefore the managerial challenge for NBFCs doesn't end with the adoption of FinTech; it's about implementing appropriate governance and risk control measures to support technological innovation.

The objectives of the study are: (i) To explore the nature and magnitude of the adoption of FinTech in the Indian NBFC sector; (ii) To analyse how it is influencing the financial risk management practices of NBFC; (iii) To examine the financial and technological risks arising out of the adoption of FinTech; (iv) To explore the regulatory framework for the operations of NBFC with the aid of FinTech and financial risk management; and (v) To draw managerial and policy implications for the adoption of FinTech in a responsible manner.

2. FinTech Adoption in the Indian NBFC Sector

2.1 Concept and Evolution of FinTech

Financial Technology (FinTech) is an umbrella term for innovation in financial services, which is possible by using technology to create new business models, applications, processes and products. It's been growing from digitizing traditional financial transactions to more complex data-driven financial ecosystems that leverage artificial intelligence (AI), machine learning (ML), big data analytics, cloud computing, application programming interfaces (APIs) and automated decision-making. Technological innovations are transforming the delivery of financial services and the structure of financial institutions, especially in the field of APIs, AI/ML, distributed ledger technology and cloud computing, according to the Basel Committee on Banking Supervision (BCBS, 2024). Earlier, digital public infrastructure and growth of partnerships between regulated financial institutions and FinTech firms (RBI, 2024a) have fanned this growth in India.

2.2 Drivers of FinTech Adoption among NBFCs

The operational, competitive and risk-management aspects of Indian NBFCs are the factors that encourage the adoption of FinTech. Digital technologies have the potential to help institutions optimise their operations, cut down on transaction and servicing expenses, enhance turnaround times and extend their geographical footprint, all without a commensurate rise in physical footprint. It is especially important for NBFCs onboarding geographically wide-spread customers, MSMEs and borrowers, whose access to conventional financial services could be hampered. Digital channels can then help to improve financial inclusion and to acquire new customers and deliver services more effectively.

The competition from digitally-driven financial service providers has also pushed the traditional financial institutions to modernise their processes. What is becoming more important is that the use of FinTech is increasingly becoming a risk-management function. According to RBI's survey of 68 NBFCs, the key drivers for digitalisation include operational efficiency and enhancements to risk management and compliance (RBI, 2024b). Data powered technologies can help to make quicker credit choices, active checking of the portfolio and better the identification of the possibly problem borrowers. The adoption of FinTech should therefore be considered not only as a new customer-service innovation, but as a growing component of institutional decision making, and risk governance.

2.3 Major FinTech Applications in NBFCs

AI and ML are becoming more prominent in automated credit assessment, predictive modelling and pattern recognition which is not considered in traditional credit assessment processes. Big-data analytics also can be used to process huge and varied datasets for borrower profiling and risk estimation. There is a need for the use of alternative credit-scoring systems to supplement conventional credit history, which can help in the evaluation of thin-file borrowers and MSMEs.

Digital lending platforms have embedded processes like customer acquisition, loan origination, underwriting, disbursement and servicing. Regulatory reporting, compliance monitoring and risk controls, electronic Know Your Customer (e-KYC) and digital identity systems are among

the ways RegTech applications can assist in regulatory reporting and compliance. While cloud computing offers scalable technological infrastructure, APIs facilitate interoperability and the sharing of financial information among systems that are authorised. BCBS (2024) mentions APIs, cloud computing and AI/ML as some of the enabling technologies driving modern financial services.

An important development in India is the framework of Account Aggregator (AA) which enables sharing of customers' financial information with other regulated entities through consent. The AA ecosystem is also a sign of the shift towards a more interconnected and data-driven financial intermediation, in addition to digital lending and P2P lending platforms (RBI, 2024a). While the benefits of these technologies include better information access and access to decision making, their benefits in terms of risk management will rely on the quality of the data, the appropriate governance and the effective technological controls.

Table 1. Major FinTech Technologies and Their Applications in Indian NBFCs

FinTech Application	Application in NBFCs	Risk-Management Relevance
AI and Machine Learning	Automated credit assessment	Default prediction and early identification
Big Data Analytics	Borrower profiling	Credit-risk identification
Alternative Credit Scoring	Assessment of thin-file borrowers	Reduction of information asymmetry
Digital Lending Platforms	Loan origination and servicing	Credit monitoring
RegTech	Automated compliance monitoring	Regulatory and compliance-risk management
e-KYC/Digital Identity	Customer identification and verification	Identity and fraud-risk mitigation
Cloud Computing	Scalable data processing and storage	Operational efficiency and resilience
APIs/Account Aggregators	Consent-based financial-data integration	Improved borrower assessment

Source: Author's synthesis based on RBI (2024a, 2024b) and BCBS (2024).

3. FinTech and the Transformation of Financial Risk Management

The use of FinTech is changing financial risk management from a largely periodic and reactive to a more data-driven, automated and forward-looking practice. The process of change is especially significant for NBFCs where the functions of lending, liquidity management, continuity of operations, fraud prevention and compliance with regulatory requirements are closely linked. Digitalisation can enhance the speed and granularity of risk assessment but the results of such applications of technology will be dependent on the quality of data, models and governance used (Reserve Bank of India [RBI], 2024b).

3.1 FinTech and Credit Risk Management

Credit risk is an important issue among lending oriented NBFCs and FinTech can play a role in various aspects of the credit risk management process. Financial institutions can leverage these applications of AI and machine learning to sort through vast amounts of structured and unstructured data used for credit assessments and risk classification. Alternative credit-scoring models could involve other information, such as transaction histories or other digital data, compared to models that rely mainly on traditional financial data. These strategies can be important for those who do not have a formal credit record and can help mitigate information asymmetries in lending (Bazarbash, 2019).

Predictive analytics also helps institutions learn about patterns that signify borrower deterioration and potential loan default. Credit risk prediction with machine learning has shown great promise in uncovering complex relationships among financial data (Khandani et al., 2010). In an NBFC environment, these capabilities can be used to assist in loan origination, portfolio monitoring and early detection of stressed accounts. In addition to the creation of digital transaction information, the repayment behavior will also allow for more ongoing monitoring of borrowers rather than relying solely on periodic assessment. However, the performance of the models should be suitably validated and monitored by humans, as models that are not accurate or unbiased can become a source of financial risk in their own right (BCBS, 2024).

3.2 FinTech and Liquidity Risk Management

Another way FinTech can enhance the liquidity-risk management is by providing timely and timely financial information. Management can have more visibility of their liquidity positions through real-time/near real-time information on cash inflows, repayments, disbursements or funding needs. Predictive analytics can aid in cash-flow forecasting and in determining possible liquidity mismatches in normal and stressed scenarios.

These skills are especially pertinent to asset-liability management (ALM). The liquidity-risk framework of the RBI mandates that liquidity-risk systems for measurement, monitoring and management be maintained for applicable NBFCs, and tools like liquidity-risk monitoring and stress testing be used (RBI, 2019). Digital analytical systems can support these processes with quicker information integration, with scenario modelling and projections. In this sense, technology is not meant to supplant traditional ALM concepts, but serve to improve the quality, timeliness and effectiveness of the implementation of these concepts.

3.3 FinTech and Operational Risk Management

Operational risk occurs when there is a deficiency or failure in a company's internal processes, people and systems or when an external event occurs. Process automation, standardisation and real-time monitoring are some of the risks that can be addressed with the help of FinTech. The automation of onboarding, verification, underwriting, loan servicing and reporting can minimize repetitive manual processes and eliminate the associated processing errors. Likewise, digital dashboards and automated controls can help management to keep track of operational metrics and detect exceptions earlier.

There might also be improvements in scalability and business continuity through cloud technologies and interconnected digital infrastructure. However, the BCBS (2024) stresses that the digitalisation is transforming, rather than eradicating, operational risk. As technology becomes more reliant, there are new issues with system availability, cyber-resilience and reliance on technology providers. Hence, achieving operational resilience also necessitates a blend of technological efficiency along with robust governance, contingency planning and supervision of third-party service providers, on the part of NBFCs.

3.4 FinTech and Fraud Risk Management

Another crucial use of FinTech is fraud management. With the help of AI and ML systems, they can process vast amounts of transactions and detect irregularities that could be indicative of fraud. Institutions can benefit from anomaly detection, behavioural analytics and automated transaction monitoring to identify unusual customer or account activity. Digital identity verification and e-KYC systems can further enhance customer identity verification and mitigate some vulnerabilities associated with identity.

The importance of detecting fraud in the early stages has also grown in importance. The Master Directions on Fraud Risk Management in Non-Banking Financial Companies (NBFCs) issued by RBI in 2024 mandates applicable NBFCs to set up an Early Warning Signals (EWS) mechanism within the NBFC fraud-risk management policy. The framework aims to enhance prevention and early detection, along with suitable monitoring and reporting procedures (RBI, 2024c). Such needs can be addressed by monitoring with the help of FinTech technology, as it allows for quicker detection and escalation of suspicious activities and patterns. But the use of technology should not replace, but supplement, institutional investigation and managerial judgment.

3.5 FinTech and Compliance/Regulatory Risk Management

Regulatory Technology (RegTech) takes digital transformation to compliance and regulatory-risk management. RegTech applications can automate the collection of data, regulatory reporting, customer verification, transaction screening and compliance monitoring. These technologies may help to alleviate the manual compliance burden and enhance consistency and timeliness. Arner et al. (2017) define RegTech as a major development in the development of technology-based financial regulations, especially given the growing complexity of data and regulatory needs faced by financial institutions.

For NBFCs, RegTech can aid in anti-money-laundering and KYC controls, identification of unusual transactions, maintaining digital records and filling regulatory reports. Compliance dashboards that are automated can also help management keep track of any exceptions and changes to any regulatory requirements. Digital audit trails can increase the traceability of the items that support it in keeping records of transactions, approvals and interventions. But, the responsibility of regulation does not shift or move from the NBFC to the technology provider. Compliance, however, will only be effective if there is a mix of technological capability, managerial accountability, data governance, and data regulatory oversight

Figure 1. FinTech-Enabled Financial Risk Management Framework for NBFCs



Source: Author's conceptualisation based on Bazarbash (2019), Arner et al. (2017), BCBS (2024), and RBI (2019, 2024b, 2024c).

4. Emerging Risks Associated with FinTech Adoption

Financial risk is not always decreased with the growth of FinTech. Instead, digitalisation can change the nature, speed and interdependency of risk in financial institutions. The RBI survey of 25 Scheduled Commercial Banks (SCBs) and 68 NBFCs highlighted cybersecurity, data privacy and third-party risks as the top concerns of the industry in relation to digitalisation (RBI, 2024b). The benefits described above thus have to be considered in the context of new and intensified vulnerabilities.

4.1 Cybersecurity Risk

More reliance on the interconnected digital platforms increases the attack surface of NBFCs. Service continuity and financial and customer information can be affected by cyberattacks, ransomware, malware or unauthorised access and disruption of digital infrastructure. Operational disturbances can possibly be further transmitted quickly across institutions and service providers via digital interconnectedness. According to RBI (2024b), cyber fraudsters are increasingly targeting financial institutions, and cybersecurity threats are one of the

significant financial-stability issues. Thus, cyber resilience needs to grow in parallel with the implementation of digital lending, cloud services and automated risk-management systems.

4.2 Data Privacy and Data Governance Risk

As more and more lending is being done via the FinTech space, gathering, linking and handling a huge amount of information from customers is becoming more and more essential. While using richer datasets can enhance credit assessment, it does pose concerns about consent, security, scope and limits of data use, and storage and unauthorised sharing. They are especially relevant when Lending Service Providers (LSPs) or Digital Lending Apps are involved in customer acquisition and servicing of the loans. The digital-lending framework of the RBI mandates that data collection be done based on the need and the consent of the borrower and also limits data collection and storage by the digital-lending participants (RBI, 2022). Responsible FinTech adoption, then, depends on effective data governance.

4.3 Algorithmic and Model Risk

Risks of automated models, especially in the application of AI and ML. Algorithms that learn from incomplete or inaccurate or historically biased data can lead to discriminatory or unreliable credit decisions. Another challenge is that complex models can be non-explainable, which can pose issues for managers, customers and regulators in comprehending the rationale behind specific results. Further issues are model drift and incorrect assumptions and overreliance on automated recommendations. Crisanto et al., (2024) cite model risk, data governance, explainability, skills and governance as key factors for AI adoption in financial services. Therefore, there is always a need for human oversight and continuous validation of models even if the automation model has a high prediction capability.

4.4 Third-Party and Outsourcing Risk

The rise in the use of FinTech has led to a rise in NBFCs' reliance on other technology providers, such as LSPs, cloud providers, data processors, and software vendors. While these could enhance scalability and access to specialised skills, they also entail operational, compliance, concentration and reputational risks. The RBI (2022) explicitly mentions that an outsourcing arrangement with the LSPs or Digital Lending Apps will not reduce the liability of the regulated entities. Thus, NBFCs are still accountable for ensuring compliance of their digital partners with the applicable regulatory requirements. Consequently, due diligence, contractual protections, regular monitoring, cybersecurity and contingency planning are critical elements of third-party risk management.

4.5 Digital Fraud and Technology Risk

Digitalisation can reinforce fraud detection at the same time as it opens up new possibilities for technologically advanced fraud. Lack of resilience in digital lending can create opportunities for identity theft, account takeover, phishing, manipulation of digital credentials and unauthorised transactions. Operations also could be disrupted by system failures, software vulnerabilities and technology-integration issues. Cyber fraud and technology-integration risks are among the concerns that come with financial digitalisation identified by the RBI (2024b). Therefore layered controls which includes authentication, transaction monitoring, anomaly detection, incident response and customer awareness are needed for NBFCs.

4.6 Systemic and Financial Stability Concerns

At the system level, the widespread use of common technologies and third party providers could lead to a rise in the interconnectedness of and concentration risk. Disruptions to a major cloud or technology provider could impact multiple institutions at the same time. Furthermore, digital transactions and information flow can increase liquidity strains and contagion in stress times. Correlated behaviour can also be observed when the institutions use the same datasets, algorithms or risk signals via digital platforms and automated decision-making processes. The RBI (2024b) warns that the digitalisation process can result in higher financial-system complexity and interconnectedness, which can lead to greater liquidity, concentration and contagion risks. The adoption of FinTech, thus, should be interpreted as a change in the financial risk landscape and not necessarily a decrease in risk.

Table 2. Dual Impact of FinTech on NBFC Risk Management

Risk Area	Risk-Reducing Effect	New/Amplified Risk
Credit Risk	Improved prediction and borrower assessment	Algorithmic bias and model risk
Liquidity Risk	Real-time monitoring and forecasting	Faster liquidity stress and contagion
Operational Risk	Automation and reduction in manual errors	System failure and technology dependence
Fraud Risk	AI-enabled detection and monitoring	Sophisticated cyber and digital fraud
Compliance Risk	Automated monitoring and reporting	RegTech and third-party dependency
Data Risk	Greater availability of decision-relevant data	Privacy, security and governance breaches

Source: Author's synthesis based on RBI (2022, 2024b) and Crisanto et al. (2024).

5. Regulatory and Institutional Framework in India

The regulatory framework for NBFCs with FinTech capabilities in India has evolved increasingly towards a more risk-sensitive, technologically savvy and proportionate lens. The Reserve Bank of India (RBI) is moving beyond just focusing on digitalisation as a tool for financial innovation and increasingly places technology risk, consumer protection, governance and operational resilience within its regulatory and supervisory framework.

5.1 RBI's Regulatory Approach towards NBFC Digitalisation

The RBI's stance aims to promote responsible innovation while mitigating potential risks due to growing digital reliance. The prudential and technology governance, cybersecurity evaluation, fraud monitoring, and consumer protection aspects of its regulatory and supervisory efforts are increasingly brought together. Technology is being leveraged for better supervision, together with more focus on cyber/IT risk assessment, fraud-risk management and KYC/AML supervision, as mentioned by RBI (2025a). It is a shift to technology-enabling supervision, with digital innovation and financial stability becoming two sides of the same coin for supervision and not two separate goals

5.2 Digital Lending Regulatory Framework

The growing popularity of Digital lending has been given special regulatory attention due to the presence of Lending Service Providers (LSPs), Digital Lending Apps (DLAs) and other technology intermediaries involved in this type of lending. These Directions introduce the Reserve Bank of India (Digital Lending) Directions, 2025, which provide a comprehensive framework for the regulation of digital credit delivery. The framework makes it the responsibility of regulated entities to ensure the arrangements are in place with LSPs and introduces requirements as regards borrower disclosures, grievance redressal, data collection and storage, due diligence and customer protection (RBI, 2025b). The framework also covers the aggregation of loans by LSPs that are affiliated with multiple lenders, aiming to enhance transparency and consumer choice. The ongoing duty of the regulated NBFC is of special importance since technological outsourcing is not a way to shift regulatory duties.

5.3 RBI Fraud Risk Management Directions, 2024

The Master Directions on Fraud Risk Management in NBFCs, issued in July 2024, greatly enhance governance and preventive controls. They need applicable NBFCs to have a Board-approved fraud-risk management policy, which specifies the Board, Board committees and senior management roles and responsibilities (RBI, 2024a). Of course, the Directions introduce a mechanism for Early Warning Signals (EWS) to detect potentially fraudulent activity and also mandate reporting of fraud to law-enforcement agencies and the RBI. Their stated purpose includes the prevention, early detection and timely reporting of fraud, thereby moving away from post event reporting and towards proactive fraud-risk governance.

5.4 IT Governance, Cybersecurity and Outsourcing

With the rise of technology-driven lending, technology governance and operational resiliency are embedded in financial-risk management. RBI's Master Direction on Information Technology Governance, Risk, Controls and Assurance Practices sets out the requirements of the regulated entities for IT governance, risk management, information-security controls and assurance practices (RBI, 2023). It covers NBFCs for Middle, Upper and Top layer. Thus, effective Governance demands that NBFCs should control cybersecurity and technology risks, both within their own systems and in technology deals with external parties.

5.5 Scale-Based Regulation and Risk Governance

The Scale-Based Regulation (SBR) framework is a move towards a more size-based approach to regulating NBFCs based on their size, complexity of their activities, and perceived riskiness. It is categorized NBFCs into Base, Middle, Upper and Top Layer and the intensity of the regulatory framework increases with the significance of the NBFCs (RBI, 2021). This is especially applicable to FinTech risk, as more complex and connected NBFCs may be more likely to cause systemic impacts in the event of a failure or disruption in governance or a technology failure.

5.6 Regulatory Gaps and Emerging Challenges

Nevertheless, the growing scope of the framework is not yet sufficient to keep up with the pace of technological innovation, creating regulatory challenges. The use of AI in lending brings up a number of issues regarding accountability for algorithms, explainability of their outcomes,

potential biases, validation and responsibility for automated decisions. The RBI itself has acknowledged that the use of rule-based algorithms and machine learning has been rising, and has been developing model-risk management principles (RBI, 2025a). Also, vulnerabilities exist due to third-party dependency and concentration on shared cloud or technology providers, which institutions may not be covered by regulation. At the same time, cyber threats are constantly changing and need regulation to be adaptable, not prescriptive. The key policy challenge is thus not to stifle FinTech innovation, but to establish suitable governance that is commensurate with the pace of innovation, consumer protection, technological accountability and financial stability.

6. Discussion and Managerial Implications

6.1 The FinTech–Risk Management Paradox

The above analysis shows that the association between the adoption of FinTech and financial risk management is not always positive and not automatically risk reducing in case of Indian NBFCs. On the contrary, FinTech changes the character and place of risk in financial intermediation. AI, machine learning and big data analysis can enhance the borrower evaluation, default forecasting and portfolio management, which can mitigate information asymmetry and enhance conventional credit risk management. Likewise, automation and real-time information can enhance liquidity monitoring, operational controls, fraud detection and regulatory compliance. In addition, these enhancements introduce more risk of model errors, data-privacy violations, cyber attacks and reliance on technology providers. The RBI (2024b) further notes that digitalisation can help reduce some of the risks, while introducing fresh risks in the areas of cyber security, data protection, reliance on third parties, and financial interconnectedness.

This presents a FinTech–risk management paradox: risk does not necessarily go away with technology and can shift from traditional financial & risk management approaches to technology-based approaches. For instance, an artificial intelligence credit model can help mitigate the risk of human error in the credit-assessment process, but simultaneously also may create algorithmic bias, model opacity, and data-governance risk. Similarly, delegating technological roles could result in higher outsourcing risks and concentration risks, but could be beneficial for the operation. The goal of management should then be to move from simply driving the adoption of FinTech to risk-aware digital transformation.

6.2 Managerial Implications for Indian NBFCs

FinTech should be part of the overall Enterprise Risk Management (ERM) framework for NBFC management, not just a standalone IT project. Boards and senior management should be very involved in the technology strategy, cyber-resilience, data governance and model risk. This aligns with the RBI's (2023) focus on the board's and senior management's responsibilities in terms of IT governance and technology-risk management.

AI-based credit and fraud models should be developed and implemented as part of formal model-governance mechanisms, including validation, performance monitoring, documentation, explainability and appropriate human intervention, for NBFCs. Cybersecurity needs to keep pace with the digital expansion. The governance of LSPs, cloud providers and

other FinTech partners is also of paramount importance as the responsibility of the regulated entity cannot be shifted to the outsourcer (RBI, 2025b). Excessive reliance on individual technology providers can be mitigated by diversifying vendors, conducting due diligence, and performing service-continuity planning and concentration-risk assessment. Investment in the capabilities of employees is also required, to ensure risk, compliance and managerial personnel can critically review the decisions made on technology rather than simply accepting what the systems provide, without any critical challenge.

6.3 Policy and Regulatory Implications

The findings at the policy level support a policy approach that is innovative, proportional, protects consumers, governs technologies and finances. Overly strict regulations can stifle positive innovation and too loose a watch can allow technological weaknesses to grow. The Basel Committee on Banking Supervision (BCBS, 2024) notes that digitalization raises strategic, reputational, operational and system-wide issues and calls for sound governance of new technologies and third party reliance. India's regulatory framework and its approach to regulation of NBFCs could be a useful starting point for proportional regulation, however, regulatory frameworks should evolve in respect of governance of AI, accountability of models, explainability and third-party concentration etc. In the end, a balance between regulation that is flexible enough to foster innovation and protect consumer interests, as well as maintain institutional resilience and financial stability should be struck as responsible FinTech development.

7. Conclusion and Future Directions

7.1 Conclusion

FinTech adoption is fundamentally reshaping financial risk management in Indian NBFCs by facilitating a transition from predominantly reactive and periodic risk assessment towards increasingly predictive, automated and real-time systems. Credit assessment, liquidity monitoring, operational controls, fraud detection and regulatory compliance will be enhanced through the use of AI and machine learning, big-data analytics, digital lending platforms, RegTech and interconnected financial-data infrastructures. In a digital financial landscape that is becoming increasingly competitive, these features can empower NBFCs to enhance their management processes and build institutional resilience.

The analysis, however, shows that financial risk is not just extinguished by technological progress, it is redistributed and transformed. Conventional credit, operational and compliance-risk management improvements can come with higher exposure to cybersecurity risks, data-governance failures, algorithmic and model risks, and digital fraud and reliance on third-party technology providers. As a result, NBFCs must adopt technology while ensuring that this is accompanied by enterprise-wide risk management, board oversight, strong cybersecurity, model validation and third-party government. Therefore, the long-term contribution of the value of FinTech should be evaluated not only by efficiency or adoption rates but by its contribution to sustainable and resilient financial intermediation.

7.2 Future Directions

Future studies need to explore the increasing importance of Explainable AI (XAI) for providing transparency and accountability in NBFC lending. Fairness, data quality, model validation and human oversight are key points to consider when establishing AI governance and responsible alternative credit scoring models. More research is also required to investigate predictive risk analytics and RegTech, as ways to further improve the risk management and the compliance of the future. Another key research agenda is cyber resilience, along with the governance of relationships with FinTech, cloud and LSPs as financial institutions increasingly rely on these external digital infrastructures. Finally, future research could focus on the cross-sectoral impact of digitalisation, technological dependencies and interdependencies of financial platforms on the resilience of financial systems and digital financial stability, not only at the institutional level. These directions can contribute to the building of a more integrated knowledge of innovation as compatible with responsible risk governance in India's evolving NBFC sector.

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