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AI IN INDIA'S FINANCIAL SECTOR: NAVIGATING THE REGULATORY LANDSCAPE

Mohammed Afzal, Maryam Meraj, Mohd. Shamim Ansari
Aligarh Muslim University, India.
e-mail: afzal.amu13@gmail.com; maryamzehra50@gmail.com; drshamimansari@gmail.com

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Abstract

Artificial Intelligence (AI) integration in India's financial sector offers transformative potential but poses challenges like algorithmic bias, data privacy risks, and regulatory fragmentation. This study employed both one-on-one interviews and surveys with various stakeholders in the financial services sector to analyse India's AI governance framework through expert interviews and a comparative policy analysis of global models (the EU's risk-based AI Act and the US sector-specific guidelines). Findings reveal gaps in accountability, transparency, and enforcement mechanisms, particularly for high-risk applications like credit scoring. This study proposes a hybrid regulatory model that combines binding rules for high-risk AI systems (e.g., fraud detection) with co-regulation for low-risk tools, emphasising scientific risk assessment, consumer grievance mechanisms, and iterative policymaking. While leveraging India's existing financial laws (e.g., Reserve Bank of India guidelines), we recommend AI-specific updates to address explainability, bias audits, and systemic risk monitoring. However, this study is limited by its reliance on publicly available regulatory documents and expert interviews, and by its focus on the Indian context, which may overlook cross-border AI governance challenges. Stakeholder collaboration and phased implementation are critical to balancing innovation with ethical safeguards in India's evolving digital economy.

Keywords: *AI financial regulations, risk management, self-regulation, co-regulation, binding regulation.*

I. INTRODUCTION

Artificial Intelligence (AI) is a groundbreaking technology that has been advancing continuously since the early 1950s.[1] Its development has been characterised by periods of significant innovation, interspersed with phases of stagnation and scepticism. In recent years, the financial sector has emerged as a key area for AI integration, prompting a surge in regulatory activities worldwide. In 2022 alone, more than 30 AI-related laws were enacted in more than 100 countries, reflecting a global urgency to address the regulatory challenges posed by AI. The financial sector, with its complex, data-intensive

[1] Frederick Kile, "Artificial Intelligence and Society: A Furtive Transformation," *AI & society* 28, no. 1 (2013): 107-115. DOI:10.1007/s00146-012-0396-0.

operations, has been particularly affected by AI.[2] The deployment of AI-driven solutions, such as fraud detection, automated trading, risk assessment, and customer service chatbots, has revolutionised financial services.

However, these advancements raise significant regulatory concerns, including algorithmic bias, data privacy, cybersecurity risks, and the ethical use of AI in decision-making. The launch of generative AI models such as ChatGPT in late 2022 further intensified these concerns, highlighting risks including misinformation, potential biases, and challenges to intellectual property protection.[3] In response, countries have adopted various regulatory approaches, ranging from the European Union's comprehensive AI Act to sector-focused guidelines in China and voluntary frameworks in the United States.[4] Despite these diverse strategies, there is broad recognition among global policymakers of the need to harness AI's potential while mitigating its associated risks.

AI has driven significant technological innovations in the modern financial industry, leading to transformative changes in financial institutions. These include the adoption of automated teller machines (ATMs) and Internet banking, as well as advances in banking operations through technologies such as image recognition, speech processing, and chatbot communication. AI has also enabled the rise of AI-driven investment advisors, revolutionising financial services. Given the profound impact of AI on financial operations, regulation becomes crucial.[5] AI regulation in the financial sector focuses on ensuring that these technologies are used responsibly, safeguarding consumer interests,[6] maintaining transparency,[7] and mitigating risks associated with automated

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[2] Mehmood Qadiri Roheed et al., "Conceptualizing Possibilities of Artificial Intelligence in Furtherance of the Banking Sector: An Effective Tool for Improving Customer Relationship, Customer Service and Public Relations," *International Journal of Finance Insurance and Risk Management* 10, no. 2 (2020): 44-65. DOI:10.35808/ijfirm/214.

[3] Yogesh K. Dwivedi et al., "Opinion Paper: "So What If ChatGPT Wrote It?" Multidisciplinary Perspectives on Opportunities, Challenges and Implications of Generative Conversational AI for Research, Practice and Policy," *International Journal of Information Management* 71 (2023): 102642, https://doi.org/10.1016/j.ijinfomgt.2023.102642.

[4] Ravtosh Bal and Indermit S. Gill, "Policy Approaches to Artificial Intelligence Based Technologies in China, European Union and the United States" (Duke Global Working Paper Series No. 26, Duke University, 2020), http://dx.doi.org/10.2139/ssrn.3699640.

[5] Nurhadhinah Nadiah Ridzuan et al., "AI in the Financial Sector: The Line between Innovation, Regulation and Ethical Responsibility." *Information* 15, no. 8 (2024): 432. https://doi.org/10.3390/info15080432.

[6] Krystyna Niziol, "The Challenges of Consumer Protection Law Connected with the Development of Artificial Intelligence on the Example of Financial Services (Chosen Legal Aspects)," *Procedia Computer Science* 192 (2021): 4103-4111, https://doi.org/10.1016/j.procs.2021.09.185.

[7] Hassan H.H. Aldboush, and Marah Ferdous, "Building Trust in Fintech: An Analysis of Ethical and Privacy Considerations in the Intersection of Big Data, AI, and Customer Trust," *International Journal of Financial Studies* 11, no. 3 (2023): 90, https://doi.org/10.3390/ijfs11030090.

decision-making processes. Effective regulation aims to balance innovation with ethical and secure financial practices.

Table 1.
Comparison between India and other countries' AI financial regulations

Jurisdiction	Key Regulation	Scope	Accountability	Transparency Requirements
EU	AI Act (2024)	High-risk AI systems	Mandatory risk assessments	Explainability for end-users
U.S.	NIST AI RMF (2023)	Sector-agnostic	Voluntary compliance	Limited to federal agencies
Singapore	MAS AI Ethics Guidelines	Financial sector focus	Industry self-assessment	Fairness and explainability
China	New Generation AI Development Plan	RegTech	Centralised AI governance	Still lacks individual rights
India	Draft Policy	Sector-agnostic	Voluntary guidelines	Minimal disclosure

Note: NIST AI RMF - Risk Management Framework (2023); NITI Aayog – National Institution for Transforming India; MAS – Monetary Authority of Singapore.

India currently lacks regulations specifically governing AI in the financial sector, leaving significant legal and regulatory gaps. While certain existing laws, such as the Information Technology Act of 2000 (the IT Act),[8] and the Payment and Settlement Systems Act of 2007 (the PSS Act),[9] are occasionally applied to AI-driven financial activities, they were not crafted to address the complexities of AI integration in the financial sector. These laws primarily regulate traditional financial operations and cybersecurity concerns but fail to address AI-specific risks, such as automated decision-making, algorithmic bias, and ethical accountability. Similarly, the Digital Personal Data Protection Bill, introduced in 2022 (the PDP Bill),[10] provides a framework for data privacy but lacks explicit provisions addressing AI's extensive data-processing capabilities, transparency requirements, and potential risks of unfair discrimination.

In the absence of a dedicated, comprehensive regulatory framework for AI, India's financial sector is exposed to several risks, including opaque algorithmic decisions, data security vulnerabilities, and the possibility of market manipulation. These gaps raise concerns for both financial stability and consumer confidence. Although the Reserve Bank of India (RBI) and other regulators have begun exploring how AI should be governed, the current approach remains piecemeal and lacks a unified, long-term strategy for the

[8] The Information Technology Act, 2000 (India).
[9] The Payment and Settlement Systems Act, 2007 (India)
[10] The Digital Personal Data Protection Bill, 2022 (India).

financial sector. Current literature on India's approach to AI regulation in the financial sector is often disjointed, focusing on isolated regulatory proposals, policy briefings, and sectoral analyses. There is a lack of comprehensive examination of India's regulatory stance on AI integration in financial services. Key questions, therefore, arise: Who are the primary stakeholders driving the AI regulatory debate in India's financial sector? What are the perspectives of financial institutions, technology providers, and policymakers? Does India require new, sector-specific AI regulations, or can existing legal frameworks be adapted to address emerging challenges? How can India balance innovation with risk management to ensure the responsible adoption of AI in the financial sector?

Given global financial regulations, India has not yet done much in this regard. This study aims to lay the foundation for policymakers and regulators to consider potential regulatory provisions for AI integration in the financial sector. While prior studies on the impact of AI regulations, standards, and governance in Asia[11] have analysed AI regulation in advanced economies such as China and Singapore,[12] few address the unique challenges of emerging markets like India, where informal financial systems coexist with rapid AI adoption. By systematically contrasting India's AI regulatory framework with those of the EU, the U.S., China, and Singapore (see Table 1), this study identifies the research gap in the Indian context. Drawing on structured comparisons with the EU, U.S., China, and Singapore, jurisdictions at the forefront of AI governance, this study identifies transferable strategies for India, such as risk-tiered regulation (EU) and sector-specific ethics codes (Singapore), we propose a hybrid three tiered AI governance model (binding regulation, co-regulation and self-regulation) that reconciles global standards within the Indian context. This paper addresses the aforementioned research questions: (RQ1) - How is AI being regulated in India's financial sector? and RQ2 - what should be the way forward for regulating AI in this domain? Unlike studies focused on Western countries and developed Asian economies, this paper adapts global AI regulatory frameworks to India's financial ecosystem, where rapid AI adoption coexists with challenges such as uneven digital access and legacy regulatory frameworks.

To achieve these objectives, this paper has examined the prevailing sentiments of legal experts, financial institutions, technology providers, and financial services users regarding the regulatory framework governing AI

[11] Jian Xu et al., "AI Governance in Asia: Policies, Praxis and Approaches." *Communication Research and Practice* 10, no. 3 (2024): 275-287, https://doi.org/10.1080/22041451.2024.2391204.

[12] Weiyu Wang and Keng Siau, "Artificial Intelligence: A Study on Governance, Policies, and Regulations," in *Proceedings of the Thirteenth Annual Midwest Association for Information Systems Conference (MWAIS 2018)*, St. Louis, Missouri, 2018, 1, https://aisel.aisnet.org/mwais2018/40.

integration in the financial sector. The paper provides a clear and actionable framework for policymakers and technology developers to facilitate India's advancement in AI regulation in the financial sector. This will help foster a regulatory environment that encourages innovation, promotes trust, and mitigates risks associated with AI-driven financial services.

II. LITERATURE REVIEW

II.A. AI Regulations in the Financial Sector

The adoption of AI in India's financial sector presents immense opportunities but also raises critical regulatory challenges. Current regulatory frameworks, primarily governed by the RBI and the Securities and Exchange Board of India (the SEBI), focus on traditional financial activities, leaving gaps in addressing AI-specific risks. The RBI has introduced regulatory sandboxes to facilitate fintech innovation, yet these initiatives remain insufficient for addressing AI's rapidly evolving risks, including systemic instability and consumer protection challenges.[13] Unlike global regulatory models such as the EU's Artificial Intelligence Act (the EU AI Act), India's current legal framework lacks clear guidelines on AI ethics, accountability, or risk mitigation strategies for financial applications. Without a comprehensive AI-specific regulatory framework, the financial sector remains vulnerable to risks such as opaque decision-making, data security threats, and market manipulation, posing challenges to financial stability and consumer trust. Existing legislation, such as the IT Act and[14] the PSS Act,[15] lacks provisions tailored to AI technologies, particularly in areas such as automated decision-making, data privacy, and cybersecurity. While RBI's regulatory sandboxes provide a platform for FinTech testing, they have yet to fully accommodate AI's disruptive capabilities. Moreover, consumer protection remains a concern, given AI's reliance on large datasets, which often raises questions about privacy, consent, and data misuse. The DPD Bill[16] provides a foundation but requires significant amendments to address AI-specific ethical considerations, including fairness, transparency, and accountability.

One of the critical regulatory challenges in AI finance is regulatory arbitrage, whereby firms exploit inconsistencies across jurisdictions to gain unfair advantages, particularly in AI-enabled tokenisation, crowdfunding, and cryptocurrency platforms. These gaps necessitate a more coordinated

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[13] Suparna Biswas et al., "AI-Bank of the Future: Can Banks Meet the AI Challenge?," *McKinsey & Company*, September 19, 2020, https://www.mckinsey.com/industries/financial-services/our-insights/ai-bank-of-the-future-can-banks-meet-the-ai-challenge#/.

[14] Biswas et al., "AI-Bank of the future."

[15] *Ibid.*

[16] *Ibid.*

global regulatory response to prevent misuse and ensure market integrity.[17] To address the opacity of AI algorithms, Explainable AI (XAI) has emerged as a regulatory priority. XAI aims to enhance the interpretability of AI models, allowing regulators to better assess risks and compliance.[18] In parallel, Regulatory Technology (RegTech) is gaining traction as a tool to facilitate AI governance by automating compliance, monitoring, and reporting activities in financial institutions. RegTech offers real-time capabilities to manage the growing complexity of regulatory demands, particularly in AI-related risk management.[19]

Moreover, regulatory sandboxes[20] have become instrumental in fostering innovation while maintaining oversight. Current trends in the literature suggest a shift toward risk-based regulatory approaches,[21] which prioritise flexibility and adaptability in AI governance. These approaches emphasise proportionality, where regulatory intensity is aligned with the level of risk posed by a specific AI application. Global literature trends reflect the broader movement towards ethical AI and responsible innovation. As AI continues to reshape the financial industry, the development of coherent and responsive regulatory frameworks will be crucial. Future research is expected to focus on establishing measurable outcomes for AI regulation, identifying best practices across jurisdictions, and ensuring that legal frameworks evolve in tandem with technological advancements. Such efforts are essential for maintaining the delicate balance between fostering innovation and safeguarding ethical, secure, and fair financial systems.

The National Institution for Transforming India (NITI Aayog) launched the "Responsible AI for All" framework, comprising two discussion papers. Part 1, Principles for Responsible AI,[22] outlines seven high-level ethical principles: inclusivity, safety/reliability, equality, transparency, privacy/security, accountability, and positive human values, explicitly grounded in India's

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[17] Joseph Lee, "Access to Finance for Artificial Intelligence Regulation in the Financial Services Industry," *European Business Organization Law Review* 21, no. 4 (2020): 731-757.

[18] Xun-Qi Chen et al., "Explainable Artificial Intelligence in Finance: A Bibliometric Review," *Finance Research Letters* 56 (2023): 104145, https://doi.org/10.1016/j.frl.2023.104145.

[19] El Bachir Boukherouaa et al., *Powering the Digital Economy: Opportunities and Risks of Artificial Intelligence in Finance,* (International Monetary Fund, 2021), https://www.imf.org/en/publications/departmental-papers-policy-papers/issues/2021/10/21/powering-the-digital-economy-opportunities-and-risks-of-artificial-intelligence-in-finance-494717.

[20] Upendra Nath Shukla, and Anil Dubey, "Expectations of FinTech Start-Ups and Regulatory Sandbox in India: An Empirical Study," *International Journal of Business Innovation and Research* 27, no. 2 (2022): 242-262, https://doi.org/10.1504/IJBIR.2022.121542.

[21] Shukla and Dubey, "Expectations of FinTech Start-Ups."

[22] NITI Aayog, *Principles for Responsible AI: Approach Document for India (Part 1)* (New Delhi: NITI Aayog, February 2, 2021), accessed July 30, 2025, https://www.niti.gov.in/sites/default/files/2021-02/Responsible-AI-22022021.pdf.

constitutional rights. In Part 2, "Operationalizing Principles for Responsible AI," concrete actions for government, industry, and academia (e.g., policy interventions, ethics-by-design incentives, capacity building, and standards compliance) are recommended for implementing these principles.[23] One of the key aspects of NITI Aayog's papers on *responsible AI* is their values-based, India-centric lens; anchoring AI guidelines in fundamental rights aims to foster trust and inclusion. However, both papers are non-binding, aspirational documents, not statutes. In practice, they rely on voluntary compliance. Researchers have noted that India's overall stance remains pro-innovation, with ethical guidelines and codes rather than formal laws.[24] This soft-touch model may ease industry uptake, but as mere self-regulation, it risks remaining low-effort promises that big actors can circumvent. In contrast, the EU AI Act is a binding, risk-based regulation imposing strict requirements and enforceable obligations (including penalties for non-compliance) on high-risk systems. NITI Aayog's Responsible AI papers establish a comprehensive ethical framework in line with international principles, but gaps remain in regulatory clarity and enforceability. Their ultimate impact will depend on follow-up legislation or institutional mechanisms to monitor and enforce compliance. This study tries to fill the gap by proposing a three-tier regulatory model, taking into consideration India's balancing approach to AI regulation.

III. METHODOLOGY

Our analysis is based on one-on-one engagement with legal experts who are professors at Aligarh Muslim University (AMU) and Delhi University (DU) in the Department of Law and the Department of Commerce. In addition, we conducted interviews with lawyers, bank managers, IT professionals, and banking customers. These engagements included detailed discussions to capture a wide range of perspectives.

We conducted ten in-depth interviews with senior professors, legal experts, technologists, and research scholars who are actively working on IT-related policy and regulation in the financial sector. Given the sensitive nature of these discussions and the interviewees' ongoing involvement in policy formulation, all participants were granted anonymity to ensure candid and open communication. Additionally, this study conducted a survey of stakeholders,

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[23] Rahul Kapoor, "AI Regulation in India: Current State and Future Perspectives," *Morgan Lewis.com*, January 26, 2024, https://www.morganlewis.com/blogs/sourcingatmorganlewis/2024/01/ai-regulation-in-india-current-state-and-future-perspectives.

[24] P. R. Biju, and O. Gayathri, "The Indian Approach to Artificial Intelligence: An Analysis of Policy Discussions, Constitutional Values, and Regulation," *AI & Society* 39, no. 5 (2024): 2321-2335, DOI:10.1007/s00146-023-01685-2.

including legal, financial, and technical experts, as well as banking customers, to gather feedback on regulations and challenges arising from AI integration in India's financial sector.

By combining qualitative data from interviews with a thorough literature review, our methodology aims to offer a subtle, distinct understanding of the current regulatory landscape and provide actionable recommendations for the way forward in AI regulation within India's financial sector.

III.A. Methodology Structure

This section is divided into three parts:

1. Capturing the perspectives of key stakeholders, including legal experts, financial institutions, technology providers, and banking customers, to understand the diverse views on AI governance.
2. Exploring the scope and AI regulation goals, the nature of AI risks associated with the financial sector.
3. Proposing a comprehensive policy roadmap for the responsible and ethical integration of AI in India's financial sector. This roadmap balances innovation with robust risk management, ensuring AI technologies are used effectively while safeguarding consumer rights and financial stability.

Part I: Overview of various stakeholders' perspectives on AI regulations in the financial sector

A. Legal Experts' Perspective

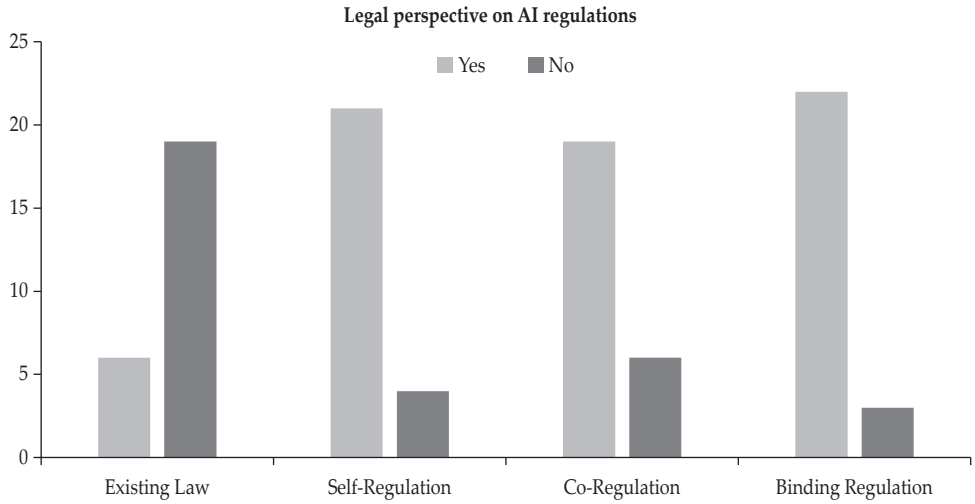
The existing regulatory aspects of AI integration in India's financial sector observe a fragmented yet critical discourse. The existing legal framework, while robust in many respects, may not be fully equipped to address the nuanced risks posed by AI technologies in finance. One of the senior professors stated that, "MeitY (Ministry of Electronics and Information Technology) is considering various regulatory options, including amending the Information Technology Act, 2000, which would be less time-consuming than adopting new legislation such as the proposed Digital India Act".[25]

There is a consensus within the legal community that existing laws on data protection, cybersecurity, and financial regulation can partially address AI's risks. However, the dynamic nature of AI, particularly in areas like algorithmic decision-making, fraud detection, and personalised financial services, introduces novel challenges that require targeted regulatory responses. A prominent debate among legal experts revolves around whether a standalone AI law is necessary. One group argues that the swift creation of a comprehensive AI

[25] {Interviewee 1 (Senior Professor, Law)}, interviewed by {Author 1}, {Aligarh/Open}, {Date of Interview (Dec 4, 2024)}.

regulation might lead to over-regulation, stifling innovation and deterring the financial sector's growth. Instead, they advocate a gradual, iterative approach that leverages existing legal structures while introducing targeted amendments to address high-risk AI use cases, such as automated lending and investment advisory services. Conversely, another group of legal experts contends that AI presents unique risks, such as a lack of transparency, algorithmic bias, and accountability issues, which existing laws are ill-equipped to handle.

Figure 1. Legal perspective



They call for a dedicated regulatory framework that incorporates principles of fairness, accountability, and transparency tailored to AI applications in finance. A respondent working as a lawyer[26] primarily dealing in financial cases advocated for special regulatory provisions and mentioned that the "Reserve Bank of India and the Telecom Regulatory Authority of India have begun to articulate the risks associated with AI integration in the financial sector" going forward, they are expected to play an essential role in shaping policy and regulatory frameworks. Overall, there is agreement on the need for a balanced approach. Self-regulation, supported by voluntary guidelines and industry standards, should be encouraged to foster innovation. However, for critical high-risk areas, bespoke regulations must be developed to protect consumers and maintain the integrity of the financial system. We also conducted a survey gauging the importance of four aspects of AI integration in the financial sector, including existing laws, self-regulation, co-regulation, and binding

[26] {Interviewee 2 (Working Lawyer)}, interviewed by {Author 1}, {New Delhi/Open}, {Date of Interview (Dec 18, 2024)}.

regulations, with 25 legal experts, including senior professors, lawyers, and research scholars of the Departments of Law at Aligarh Muslim University and Delhi University, on existing laws regarding AI integration in the financial sector. The survey results are presented in Figure 1 below.

B. Financial Perspective

The integration of AI into the financial sector offers efficiency, transformative potential, cost reduction, and enhanced customer experiences. However, this potential is accompanied by significant regulatory challenges. Financial institutions recognise the importance of a clear regulatory framework to ensure the responsible use of AI while safeguarding consumer trust and financial stability. Most financial institutions are cautious about the introduction of strict, overarching AI regulations. They argue that heavy-handed regulations could hinder innovation and the development of AI-driven financial products. An IT and System Manager[27] emphasised, "There's no need for new regulations at all, as AI presents no novel risks in the financial sector", reflecting a more conservative stance on the matter. Instead, they advocate for a "light-touch" regulatory approach that encourages experimentation and innovation while addressing key risks. A primary concern for financial institutions is the regulatory ambiguity surrounding the use of AI in decision-making processes, such as credit scoring, risk assessment, and fraud detection. They call for clear guidelines on issues like data privacy, algorithmic accountability, and transparency.

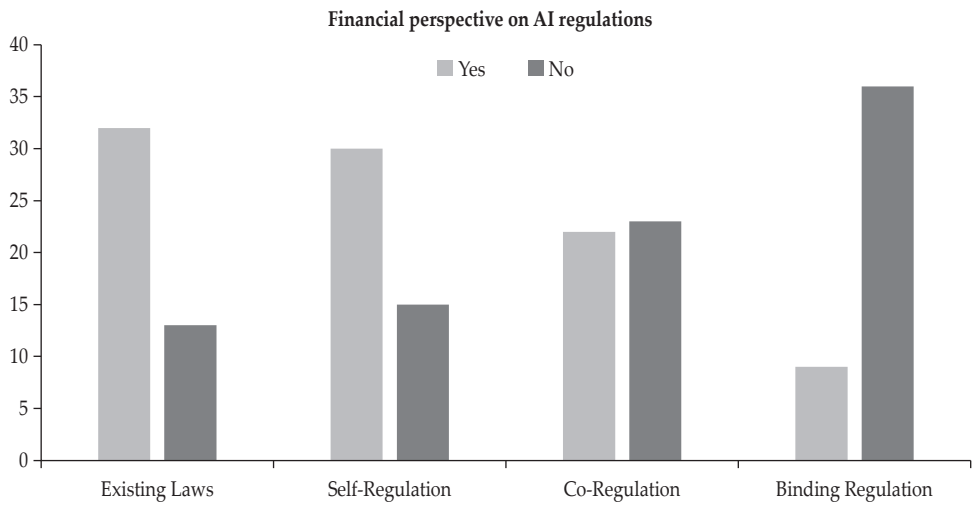
Institutions also emphasise the need for regulatory frameworks that are adaptable to the rapid evolution of AI technologies. Financial institutions support a two-tier regulatory approach: self-regulation through internal governance mechanisms, supplemented by targeted regulations for high-risk areas. They believe this approach will allow them to innovate responsibly while ensuring compliance with core regulatory principles. Conversely, a senior professor at the Department of Commerce, AMU,[28] highlighted the necessity for regulation by quoting prominent industry leaders, "Google president Kent Walker has stated, 'AI is too important not to regulate, and too important not to regulate well, in addition to it he also expressed that financial services are using AI are on the top of the list, so there must be a proper regulation which would help innovations to foster well'". Similarly, another professor at the Department

[27] {Interviewee 3 (IT & System Manager, Bank)}, interviewed by {Author 1}, {Noida/Open}, {Date of Interview (Dec 11, 2024)}.

[28] {Interviewee 4 (Senior Professor, Commerce)}, interviewed by {Author 1}, {Aligarh/Open}, {Date of Interview (Dec 5, 2024)}.

of Commerce, Delhi University,[29] stated that "Microsoft President Brad Smith said that there has never been an industry that has successfully regulated itself entirely. He emphasised the need for more laws and regulations, adding that AI regulations should not be overlooked. He added that reports and decisions made by AI should be made accountable for the handler to whom it may be used for further consideration". Moreover, collaboration between regulators, financial institutions, and technology providers is important for developing a regulatory framework that balances innovation with risk management. Further, we surveyed 45 individuals, including bank managers (Indian Banks) and senior professors, and research scholars in the Departments of Commerce at Aligarh Muslim University and Delhi University, to measure the importance from a financial perspective of four aspects: existing laws, self-regulations, co-regulations, and binding regulations regarding regulations of AI integration in financial sectors. Results of the survey are presented in Figure 2 below.

Figure 2. Financial perspective



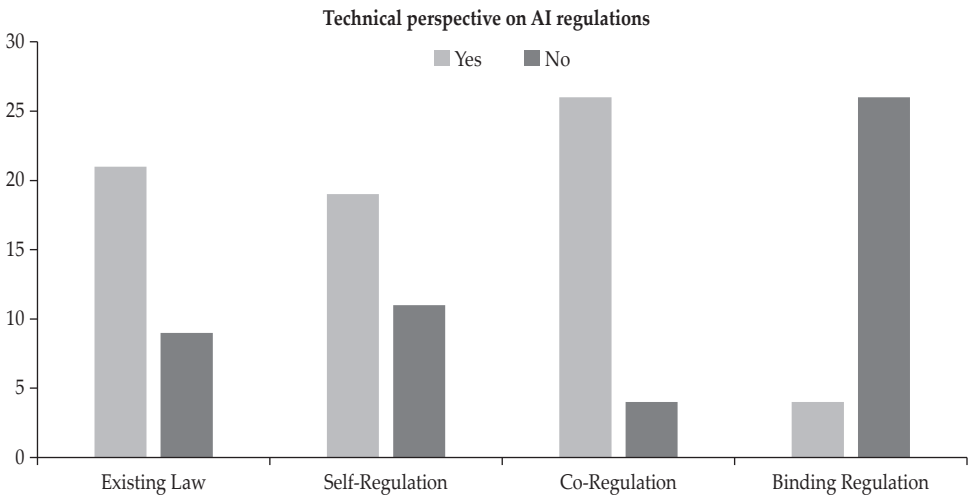
C. Technical Perspective

Technology providers, particularly those specialising in AI solutions for the financial sector, play an important role in shaping the regulatory landscape. From their perspective, the integration of AI in finance offers opportunities for innovation, efficiency, and enhanced customer experiences. However, they also recognise the challenges posed by regulatory uncertainty and the potential

[29] {Interviewee 5 (Senior Professor, Commerce)}, interviewed by {Author 1}, {New Delhi/Open}, {Date of Interview (Dec 19, 2024)}.

for over-regulation. One of the experts[30] asserted that "there is hardly any harm in AI integration in the financial services industry, regulating through existing legal provisions is enough at this time". Many technology providers advocate for a flexible, risk-based regulatory approach. They caution against adopting a comprehensive AI law, arguing that it could stifle innovation and hinder the deployment of AI solutions. Instead, they propose an iterative regulatory model that evolves in tandem with technological advancements. This model should focus on high-risk use cases, such as algorithmic trading and automated lending, where the potential for harm is greatest. Technology providers emphasise the significance of collaboration between industry stakeholders and regulators to develop practical, implementable guidelines. Although one expert[31] raises concerns about intellectual property rights provisions, stating that "despite the effectiveness of IPR Act provisions, intellectual property of financial AI technology should require a special provision". They support the idea of self-regulation, underpinned by industry standards and voluntary commitments, to address immediate risks. However, they acknowledge the need for targeted regulations to ensure accountability and transparency, particularly in areas involving consumer data and algorithmic decision-making.

Figure 3. Technical perspective



Overall, technology providers believe that a balanced regulatory approach will enable them to innovate while maintaining consumer trust and protecting the financial system's integrity. They call for ongoing dialogue with regulators

[30] {Interviewee 6 (Technical Expert in IT firm)}, interviewed by {Author 1}, {Noida/Open}, {Date of Interview (Dec 12, 2024)}.

[31] {Interviewee 7 (Technical Expert in IT firm)}, interviewed by {Author 1}, {Noida/Open}, {Date of Interview (Dec 13, 2024)}.

to ensure the regulatory framework remains adaptive and supportive of technological progress. A survey was conducted on four aspects, such as existing laws, self-regulations, co-regulations, and binding regulations, with 30 individuals, including IT systems managers (From the top three Indian Banks) and senior professors and research scholars in the Departments of Commerce at Aligarh Muslim University and Delhi University, to measure the importance from a financial perspective of four aspects, existing laws, self-regulations, co-regulations, and binding regulations. In Figure 3, the responses are presented.

D. Banking Customer Perspective

Banking customers, as end-users of AI-driven financial services, have a vested interest in the regulatory framework governing AI integration in the financial sector. From their perspective, AI offers the promise of more personalised, efficient, and accessible financial services. However, they are also acutely aware of the potential risks, such as data privacy breaches, algorithmic biases, and a lack of transparency. Customers express a strong desire for a regulatory framework that ensures their data is protected and used ethically. They are concerned about the potential for AI to make biased or unfair decisions, particularly in areas like loan approvals and credit scoring. Customers want assurances that AI-driven decisions are transparent, explainable, and subject to human oversight. One of the customers[32] expressed his view that:

"Financial institutions must be held accountable for ensuring that AI does not misuse or share sensitive financial data without explicit consent. There should be strict compliance with data protection laws, along with strong encryption and anonymisation protocols to safeguard customer information".

While customers appreciate the benefits of innovation, they also call for robust regulatory safeguards to protect their rights. They support targeted regulations for high-risk AI applications, ensuring that financial institutions are held accountable for the outcomes of their AI systems. One research scholar[33] stated*:*

"AI systems must be regularly audited to prevent biases based on gender, caste, or socioeconomic status. Financial institutions should ensure that their AI models do not reinforce existing inequalities, particularly in loan approvals and credit scoring. Transparency in AI decision-making is crucial to prevent algorithmic discrimination and ensure fair access to financial services for all individuals."

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[32] {Interviewee 8 (Banking customer)}, interviewed by {Interviewer}, {Aligarh/Open}, {Date of Interview (Dec 6, 2024)}.

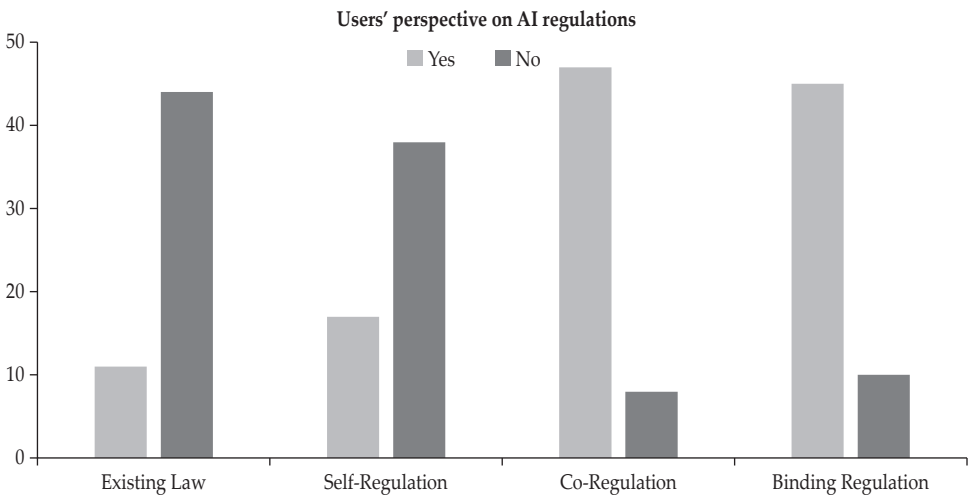
[33] {Interviewee 9 (Research Scholar, Law)}, interviewed by {Author 1}, {Aligarh/Open}, {Date of Interview (Dec 6, 2024)}.

Customers are particularly concerned about the use of AI in areas that could have significant personal and financial impacts, such as automated lending and investment advice. Another customer[34] remarked:

"AI should not be the final authority on critical financial decisions. If an error occurs, institutions must be held accountable, and customers should have access to a transparent grievance redressal mechanism. There should always be an option for human intervention in AI-based decisions to ensure fairness and accuracy."

In summary, banking customers seek an appropriate regulatory approach that fosters innovation while prioritising consumer protection. They believe that clear, enforceable guidelines are necessary to enhance trust in AI-driven financial services and to ensure that these technologies are used ethically and responsibly. We surveyed approximately 55 banking customers on AI regulations in the financial sector, measuring the importance of existing laws, self-regulations, co-regulations, and binding regulations. Figure 4 presents the survey findings.

Figure 4. Banking customers' perspective



Part II: Scope and objective of AI regulations for the financial sector

To address how AI should be regulated within India's financial sector, it may be useful to draw analogies with other general-purpose technologies. In a RAND research paper,[35] Michael J. D. Vermeer compares AI with technologies such

[34] {Interviewee 10 (Banking customer)}, interviewed by {Author 1}, {location/method}, {Date of Interview (Dec 6, 2024)}.

[35] Michael J. D. Vermeer, *Historical Analogues That Can Inform AI Governance,* (RAND Corporation, 2024), www.rand.org/t/RRA3408-1.

as the internet, nuclear technology, encryption, and genetic engineering. His comparison underscores key factors shaping their governance, including the risks they pose, the degree of agreement on those risks, and the importance of the collaborative role of government and industry in managing them. Drawing from this analogy, we argue that for a two-way utilisation, general-purpose technology like AI, three foundational principles of regulation must be clarified upfront for its integration into the financial sector:

1. **Objectives**. Policymakers must explicitly define the purposes of any regulatory actions in the financial sector. Typically, regulation addresses market failures such as information asymmetry, negative externalities, abuse of market power, and consumer harm. In the financial context, this includes mitigating systemic risks, ensuring consumer protection, and promoting transparency and accountability. For instance, regulations should aim to prevent discriminatory lending practices or data breaches caused by AI systems.
2. **Scope**. AI regulation in the financial sector should clearly delineate which aspects require oversight. Given challenges like the "black box" problem of AI and rapid technological evolution, it is essential to focus on specific areas such as data inputs (e.g., customer data used for AI training), decision-making outputs (e.g., automated credit approvals), and operational processes (e.g., AI-driven fraud detection). The 'black box' issue in AI describes the challenge of interpreting or explaining how advanced machine-learning and deep-learning models arrive at their decisions.[36] This targeted approach ensures that regulation is practical and enforceable.
3. **Liability**. The regulation should specify who is accountable for AI-related outcomes in the financial sector. This includes distinguishing the roles and responsibilities of AI developers, AI deployers, and financial institutions that use AI. Clear liability frameworks are necessary to address issues such as erroneous financial advice or unauthorised use of customer data by AI systems. This will require updating existing legal definitions and frameworks to accommodate the unique characteristics of AI applications in finance.

By focusing on the objectives, scope, and liability regarding AI integration in the Indian financial sector, a regulatory framework could be built that promotes innovation while ensuring the responsible use of AI.

Nature of AI Risks in the Financial Sector

A risk-based approach to AI regulation is increasingly favoured in the financial sector, aiming to mitigate potential harm to individuals and the financial

[36] Cynthia Rudin and Joanna Radin, "Why Are We Using Black Box Models in AI When We Don't Need To? A Lesson from an Explainable AI Competition," *Harvard Data Science Review* 1, no. 2 (2019), https://doi.org/10.1162/99608f92.5a8a3a3d.

system at large. This approach is endorsed by senior professors and scholars, as well as key stakeholders such as bank managers, IT professionals, and banking customers. In current discussions, the concepts of risk and harm are often conflated. However, a critical distinction exists that risk pertains to the "probability of harm occurring and its severity", as explained by a group of experts led by AI pioneer Professor Yoshua Bengio, in a report on the safety of advanced AI.[37] In this context, risk has a "future orientation", assessing the aggregate impacts of AI systems on financial markets and individuals. This future-oriented perspective justifies focusing AI regulation on risk rather than harm, since harm refers to incidents that have already occurred. Consequently, an essential component of a risk-based regulatory approach involves gathering evidence of potential harm to evaluate and anticipate associated risks. The classification of risks within the financial sector is pivotal. A UK government report categorises AI risks into three types: malfunctions, malicious use, and systemic risks. In financial services, these could manifest as fraud, system errors leading to financial instability, and widespread economic disruptions. Risks can also be classified as safety risks, such as unauthorised transactions or breaches of financial data, and risks to fundamental rights, including discriminatory lending practices, with overlaps between these categories.

Moreover, risks may vary across different stages of AI deployment, including design, development, and implementation. They also differ in scope (e.g., systemic financial risks), timescale (short-, medium-, or long-term impacts), and whether they are sources or inputs (e.g., data quality versus automated financial decisions). The Massachusetts Institute of Technology AI risk repository[38] identified 1000+ types of risk, divided into seven taxonomies, of which four are directly related to financial risk and three are categorically related to the financial sector. Regulatory frameworks, such as the EU AI Act,[39] classify these risks into levels such as unacceptable, high, limited, and minimal, providing a structured approach that India could adapt to safeguard its financial ecosystem. The incorporation of AI into the financial sector introduces a range of risks that require careful management through appropriate regulation. Table 2 below outlines significant AI-related risks in the financial sector, with illustrative examples of potential harm, to inform ongoing policy discussions. This analysis encompasses various forms of AI, including generative AI, general-purpose AI, and artificial general intelligence.

[37] Yoshua Bengio et al., "International AI Safety Report 2025," Department for Science, Innovation and Technology (DSIT), January 19, 2025, https://internationalaisafetyreport.org/publication/international-ai-safety-report-2025.

[38] *"What Are the Risks from Artificial Intelligence?"* Massachusetts Institute of Technology AI Risk Repository. 2025. https://airisk.mit.edu/.

[39] "What Are the Risks."

Table 2.
AI risk categories in the financial sector

Potential Risk	Associated Harms
1. Data Privacy and Security Risks	Threats and vulnerabilities arising from the integration of AI in the financial sector, where sensitive customer data may be misused, improperly accessed, or exposed to breaches.
2. Algorithmic Bias and Discrimination	Unfair treatment or outcomes in financial decisions caused by biased AI systems, impacting certain groups disproportionately.
3. Transparency and Accountability	The inability to understand or explain AI-driven decisions in the financial sector, leading to challenges in assigning responsibility for errors or biases.
4. Fraudulent Activities	AI-powered malicious attacks, such as identity theft, fraud detection bypass, and unauthorised financial transactions.
5. System Malfunctions	Errors in AI models causing incorrect financial predictions, transaction failures, or market instability.
6. Discriminatory Practices	Algorithmic bias leading to unfair lending decisions, insurance pricing, or credit scoring.
7. Privacy Violations	Breaches of sensitive customer data used for training AI models or in operational processes.
8. Cybersecurity Threats	Exploitation of AI vulnerabilities for cyber-attacks on critical financial infrastructure.
9. Accountability Gaps	Difficulty in determining responsibility for errors or harm caused by autonomous AI systems.
10. Systemic Financial Risks	AI amplifying risks of market volatility or causing cascading failures across interconnected financial systems.
11. Unintended Consequences	AI-driven decisions leading to unintended harm, such as unauthorised or incorrect transactions.
12. Economic Disruptions	Widespread job displacements or economic imbalances due to AI automation in financial operations.
13. Ethical Concerns	Manipulative AI applications targeting vulnerable consumers or exploiting behavioural biases.
14. Data Quality Issues	Inaccurate or biased training data leading to flawed AI model outputs.
15. Regulatory Compliance Risks	Non-compliance with existing laws due to the complexity and evolving nature of AI technology.

The above-mentioned categories of risks[40] associated with AI integration into the financial sector should be studied in detail to develop a proper AI risk-categorising framework tailored to India. India must develop an AI risk classification framework tailored to its financial sector, with a focus on high-risk applications such as credit scoring, lending, fraud detection, and consumer protection. Given AI's significant impact, stringent oversight is essential, informed by scientific research and market studies. Regulatory efforts should consider local adoption levels, digital literacy, and consumer awareness. Some risks may be mitigated through subsidies or reskilling programs, while

[40] Mohanty Amlan and Shatakratu Sahu, *"India's Advance on AI Regulation,"* Carnegie Endowment for International Peace, November 21, 2024, https://carnegieendowment.org/research/2024/11/indias-advance-on-ai-regulation?lang=en&center=india.

long-term threats require ongoing monitoring. Existing financial regulations should be evaluated and adapted to address AI-specific challenges, ensuring an appropriate approach that fosters innovation while safeguarding financial stability and consumer interests.

Part III: Policy roadmap for regulating AI in India's financial sector

The current legal framework in India can be amended to some extent to address risks linked with the incorporation of AI systems into the financial sector. However, relying solely on modifying existing legal instruments to regulate AI systems, particularly in assigning liability, represents a reactive rather than a proactive approach. A robust regulatory framework for AI integration in India's financial sector requires a preventive or precautionary approach. This would involve instituting an effective governance regime and market supervision mechanisms to closely monitor the deployment of AI applications, extending beyond areas such as algorithmic trading. To this end, a pre-market approval system for authorising the deployment of specific AI systems in the financial sector is recommended.

Additionally, India should consider implementing an AI-specific regulatory framework for the financial sector. This framework should encompass licensing, registration, due diligence, ongoing monitoring, explainability requirements, fit-and-proper tests for key AI personnel, a robust sanctioning process for non-compliant AI systems, and personal accountability mechanisms. These measures aim to minimise the risks of financial losses and other harms associated with AI integration. Moreover, a dedicated regulatory and licensing body is crucial. India should establish an AI-specific unit within regulatory bodies such as the RBI or the SEBI. This unit should collaborate with an independent AI review committee to ensure thorough assessments of AI systems before deployment. Such a proactive and comprehensive regulatory framework would not only safeguard the financial ecosystem but also build trust among stakeholders, fostering responsible innovation in India's AI-driven financial sector.

As AI deployment is in its nascent state, full regulation may stifle its innovative potential. However, scholars and the legal community suggest a balanced approach to regulating AI in the financial sector through three methods: self-regulation, where financial institutions establish internal standards and practices for AI deployment; co-regulation, involving collaboration between regulators and industry stakeholders to create flexible, adaptive guidelines; and binding regulations, which mandate pre-market approval, licensing, registration, and ongoing monitoring to ensure safety, accountability, and ethical use. This multi-tiered framework seeks to support innovation while

safeguarding financial stability and consumer protection. The following are to be taken into consideration while devising regulatory provisions:

1. Self-regulation

In the context of regulating AI integration in India's financial sector, self-regulation[41] has garnered significant attention as a viable regulatory model, supported by several compelling arguments. Industry stakeholders advocate self-regulation, citing India's success in digital advertising and alignment with NITI Aayog[42] and the RBI[43] principles. Financial institutions and start-ups benefit from self-regulation, enhancing trust, market positioning, and securing contracts while providing a cost-effective credibility signal. Self-regulation has emerged as a viable model for governing AI in India's financial sector, supported by legal precedent such as the IT Act, which permits industry-developed codes of practice under Section 43A for data protection. Similarly, the RBI's 2021 guidelines on digital lending encourage self-regulatory organisations (SROs) to craft codes for fintech accountability, mirroring the U.S. NIST AI Risk Management Framework[44] (NIST AI RMF), a voluntary, sector-agnostic set of guidelines that were subsequently rescinded.[45] However, unlike the binding EU AI Act, Article 9, which mandates ex-ante conformity assessments for high-risk AI systems, India's self-regulatory framework lacks statutory teeth, relying on market incentives like reputational gains. For instance, the NITI Aayog's Responsible AI Strategy[46] proposes non-binding ethical principles, contrasting with China's 2023 Generative AI Measures, which impose mandatory security reviews and algorithmic transparency (Article 4) under state oversight.

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[41] "The code for Self-Regulation of Advertising Content in India," Advertising Standards Council of India, June 2022 edition, https://www.ascionline.in/wp-content/uploads/guidelines/ASCI_Codes_Guidelines_Book.pdf; Ministry of Electronics Information Technology "Intermediary Guidelines and Digital Media Ethics Code)" February 25, 2021, updated April 6, 2023. https://mib.gov.in/sites/default/files/2024-02/IT%28Intermediary%20Guidelines%20and%20Digital%20Media%20Ethics%20Code%29%20Rules%2C%202021%20English.pdf.

[42] "Responsible AI, #AIForAll, Approach Document for India: Part 2 – Operationalizing Principles for Responsible AI," NITI Aayog, Government of India, November 2022, https://www.niti.gov.in/sites/default/files/2022-11/Ai_for_All_2022_02112022_0.pdf.

[43] "Unchecked Use of AI in Banking Poses Risk: RBI Governor Shaktikanta Das," The Times of India, October 15, 2024, https://timesofindia.indiatimes.com/business/india-business/unchecked-use-of-aiin-banking-poses-risk-rbi-governor-shaktikanta-das/articleshow/114227753.cms.

[44] Nandhini Swaminathan and David Danks, "Application of the NIST AI Risk Management Framework to Surveillance Technology," arXiv preprintarXiv:2403.15646 (2024). https://doi.org/10.48550/arXiv.2403.15646.

[45] Joseph R. Biden, Exec. Order 14110, 88 Fed. Reg. 75191 (November 1, 2023), https://www.federalregister.gov/documents/2023/11/01/2023-24283/safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence.

[46] "Responsible AI, #AIForAll,"

In the EU, self-regulation coexists with binding laws. For example, the Digital Services Act of 2023[47] allows platforms to adopt voluntary codes under Article 45, provided they align with EU fundamental rights. Conversely, India's Digital Personal Data Protection Act[48] (DPDP 2023), while enabling sectoral SROs under Section 36, stops short of mandating AI-specific rules. Startups, as seen in China's 2021 Personal Information Protection Law (PIPL), face minimal penalties for non-compliance, fostering innovation but risking ethical gaps. India's approach mirrors the U.S. Securities and Exchange Commission (SEC)'s 2023 advisory for self-policing AI bias in trading algorithms yet lacks the EU's ex-post audit requirements (EU AI Act, Article 68) to validate self-regulatory claims. Thus, India's self-regulation model, while flexible, requires statutory guardrails (e.g., amendments to the RBI Act) to align with global accountability standards. The following aspects need to be addressed while implementing self-regulation:

- **Transparency**. Mirroring the EU AI Act's explainability mandates, Indian institutions must disclose AI decision-making processes (e.g., credit scoring algorithms).
- **Accountability**. Assign clear responsibilities for AI outcomes, as seen in the U.S. SEC's guidance for AI-driven trading systems.
- **Ethical Compliance**. Adopt bias-mitigation practices aligned with Singapore's Monetary Authority of Singapore (MAS) AI Ethics Guidelines.
- **Risk Mitigation**. Proactively address risks, including algorithmic discrimination, similar to the EU's high-risk AI classification.
- **Performance Monitoring**. Implement iterative evaluations, as advocated by the NIST AI RMF.

While self-regulation offers flexibility, its reliance on market incentives risks creating gaps in enforcement, similar to those faced in the U.S. SEC's voluntary frameworks. This emphasises the need for co-regulation to balance industry autonomy with systemic safeguards.

2. Co-regulation

Many experts emphasise the urgent need for co-regulatory models in India to address the integration of AI into the financial sector. Co-regulation[49] offers a middle ground, easing the burden on public institutions while still providing

[47] "*The Digital Services Act: Practical Implications for Online Services and Platforms," Latham & Watkins,* March 2023, https://www.lw.com/admin/upload/SiteAttachments/Digital-Services-Act-Practical-Implications-for-Online-Services-and-Platforms.pdf

[48] "The Digital Services Act."

[49] Andreas Doelker, "Self-Regulation and Co-Regulation: Prospects and Boundaries in an Online Environment" (PhD diss., University of British Columbia, 2010), https://open.library.ubc.ca/soa/cIRcle/collections/ubctheses/24/items/1.0071207.

stronger accountability than self-regulation. It is particularly suited to managing "high-risk use cases" in finance, where government oversight is essential for mitigating systemic risks and ensuring consumer protection.

Co-regulation merges industry self-governance with state oversight, offering a middle path between India's fragmented self-regulation and the centralised EU AI Act. Under the EU framework, co-regulatory audits of high-risk AI systems (e.g., credit scoring) require firms to align with industry standards and submit to ex post government inspections. Similarly, India's DPDP Act enables sectoral SROs. However, enforcement relies on the Data Protection Board, unlike the U.S. SEC's 2023 rules for AI in asset management, which empower the SEC to penalise non-compliance despite industry co-drafted guidelines.

In contrast, China's 2023 Interim Measures for Generative AI impose state-approved industry standards (Article 7), merging self-governance with rigid oversight. India's RBI Guidelines on Digital Lending (2022) propose a hybrid model, encouraging FinTech SROs to design codes under RBI supervision similar to the EU's Digital Services Act, where platforms adopt voluntary codes (Article 45) subject to EU Commission review. India lacks statutory penalties for non-compliance, unlike China's fines under the Cybersecurity Law (2021) or the U.S. Federal Trade Commission's Section 5 authority to prosecute unfair trade practices (which applies to misuse of AI in the banking sector). However, there are significant challenges with adopting co-regulatory models in India:

Challenges in India

1. **Conceptual Ambiguity**. Unlike the EU's clear distinction between self-regulation and binding rules, India's SROs (e.g., in digital lending) often operate under de facto state control, diluting co-regulation's collaborative intent.
2. **Structural Barriers**. India's history of failed co-regulatory models (e.g., online gaming) reflects systemic issues like political resistance to decentralisation, contrasting sharply with China's top-down AI governance, which enforces compliance through state audits.
3. **Implementation Delays**. Prolonged regulatory voids, as seen in India's digital payment sector, risk exacerbating AI-driven financial fraud, unlike the phased rollout of the EU AI Act.

Proposed Co-Regulatory Provisions*:*

- **Collaboration**. Foster partnerships akin to the U.S. NIST-SEC collaboration for fintech oversight.
- **Standards**. Develop enforceable guidelines inspired by the EU's sector-specific transparency rules.

- **Adaptability**: Integrate agile policymaking, as seen in Singapore's iterative MAS guidelines.

Despite its promise, co-regulation faces scepticism in India due to weak enforcement and loosely implemented regulations, unlike the EU's strict penalties for non-compliance. However, premature binding rules risk stifling innovation, as stakeholders have cautioned.

3. Binding regulation

Despite support for self- and co-regulation models, there are notable concerns about their efficacy. Critics argue that the entities profiting from AI systems should not solely determine their own regulations,[50] as this creates a conflict of interest and leads them to find loopholes in co-regulatory provisions to bypass them. Instances of failure[51] in adopting generative AI guidelines due to overly broad and prescriptive scopes highlight the practical challenges of self-regulation and co-regulation. Furthermore, scepticism exists among policymakers who question whether the Indian government can rely on big tech and financial corporations to self-regulate effectively. They contend that binding regulations are essential for managing risks such as algorithmic bias, systemic failures, and data privacy breaches in the financial sector.[52]

Binding regulations[53] for AI integration in the financial sector are a critical yet complex undertaking in the Indian context. Many experts caution against prematurely adopting binding rules for various reasons. First, there is a lack of an integrated risk assessment specific to AI in financial services to establish new rights and obligations. Second, there is a lack of empirical evidence demonstrating market failure, raising concerns about imposing higher compliance costs on stakeholders. Third, many anticipated risks can be mitigated under existing legal frameworks, though a detailed gap analysis is essential to identify regulatory lacunae. Binding regulations should prioritise a hybrid approach, combining risk management practices from the U.S. model

[50] Philipp Hacker, "The European AI Liability Directives–Critique of a Half-Hearted Approach and Lessons for the Future," *Computer Law & Security Review* 51 (2023): 105871, https://doi.org/10.1016/j.clsr.2023.105871.

[51] Richard Judge et al. "Regulating for Resilience," National Preparedness Commission, September 6, 2024. https://nationalpreparednesscommission.uk/publications/regulating-for-resilience/.

[52] Johanna Moberg, and Alexis Olevall, "Artificial Intelligence within Financial Services-In Relation to Data Privacy Regulation" (Master's Thesis, University of Gothenburg, 2018), https://gupea.ub.gu.se/server/api/core/bitstreams/9a03c2eb-b3b2-4775-916a-5e23b9073dca/content.

[53] Nathalie A. Smuha, "From a 'Race to AI' to a 'Race to AI Regulation': Regulatory Competition for Artificial Intelligence," *Law, Innovation and Technology* 13, no. 1 (2021): 57-84, https://doi.org/10.1080/17579961.2021.1898300.

with consumer protections[54] and ethical standards[55] from the EU model. Risk management ensures that AI systems in financial operations are assessed for potential threats, emphasising transparency, accountability, and effective mitigation strategies.

Simultaneously, adopting the EU's focus on consumer protection and ethical standards guarantees fairness, equity, and reliability, safeguarding consumers from discrimination and unethical practices. A solid regulatory framework must incorporate robust consumer protection and ethical standards to safeguard users against bias, fraud, and privacy violations. State-driven initiatives should promote AI-driven financial inclusion, particularly in underserved regions. Harmonising AI regulations with data protection laws ensures compliance while fostering trust. Addressing ethical AI challenges, including bias and accountability, is crucial for fairness. Finally, global regulatory collaboration is essential for establishing standardised best practices, ensuring the responsible and secure deployment of AI in the financial ecosystem. The following could serve as guiding principles for AI binding regulations in the Indian financial sector:

1. Emphasise Innovation while Managing Risk

The United States follows an innovation-focused regulatory approach[56] that balances technological growth with robust risk management and compliance frameworks. This model shows the importance of fostering financial innovation, especially in AI-driven financial services, while implementing risk management strategies. In India, the financial sector is growing rapidly with the introduction of AI-based services like digital lending, credit scoring, and fraud detection systems. However, India must be cautious about potential risks, including fraud, cybersecurity issues, and data breaches. Regulatory bodies like the RBI and SEBI can find inspiration in the U.S. model by ensuring that AI innovation does not compromise financial stability, consumer trust, or privacy protection. This can be done through:

- Clear guidelines for AI use in financial products to ensure responsible adoption of technology.
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[54] Kislaya Prasad, "Regulating AI: The Corporate Innovation vs. Consumer Protection Tradeoff," *SSRN* (2024), http://dx.doi.org/10.2139/ssrn.4726374.

[55] Lucia Vesnic-Alujevic et al., "Societal and Ethical Impacts of Artificial Intelligence: Critical Notes on European Policy Frameworks," *Telecommunications Policy* 44, no. 6 (2020): 101961, https://doi.org/10.1016/j.telpol.2020.101961.

[56] Xukang Wang and Ying Cheng Wu, " Balancing Innovation and Regulation in the Age of Generative Artificial Intelligence," *Journal of Information Policy* 14 (2024): 385-416, DOI:10.5325/jinfopoli.14.2024.0012.

- Creating a dynamic regulatory framework that adapts to the evolution of AI technologies, enabling both innovation and compliance with existing financial laws.

2. Incorporate Strong Consumer Protections and Ethical Standards

The EU's regulatory model is distinguished by its strong emphasis on consumer protection,[57] data privacy, and the ethical use of AI. The EU General Data Protection Regulation (GDPR)[58] is a key framework that ensures data privacy, transparency, and accountability, especially concerning how AI uses personal data. Given India's vast population and the challenges of data privacy, it is crucial to adopt a similar model to protect consumers from potential exploitation by AI algorithms.

India's approach should focus on:

- **Consumer rights protection**. This involves ensuring that AI algorithms do not harm users, whether through unfair discrimination, loss of privacy, or lack of transparency.
- **Ethical AI usage.** Indian regulators can encourage the financial sector to adopt ethical AI guidelines to make sure that AI models are fair, transparent, and accountable.
- **Data protection laws**. A national data protection framework, inspired by the GDPR, should be established to ensure that personal data is safeguarded and used responsibly in AI-powered financial services.

3. State-Driven Promotion of AI for Financial Inclusion

The Chinese model for AI regulation is state-driven,[59] with the primary focus on using AI for financial inclusion, improving economic efficiency, and integrating AI with the social credit system. Given India's large and diverse population, financial inclusion remains a key challenge. India can draw from China's model by leveraging AI to enhance financial access for underserved populations, including rural communities, microenterprises, and low-income individuals.

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[57] Valery Stepenko et al., "EU Personal Data Protection Standards and Regulatory Framework," *Journal of Applied Security Research* 17, no. 2 (2022): 190-207. https://doi.org/10.1080/19361610.2020.1868928.

[58] The General Data Protection Regulation 2016/279 (European Union), 2018.

[59] Webster Graham et al., *"China's 'New Generation Artificial Intelligence Development Plan' (2017),"* DigiChina, August 1, 2017, https://digichina.stanford.edu/work/full-translation-chinas-new-generation-artificial-intelligence-development-plan-2017/.

India can:

- Develop AI-based financial inclusion strategies that target underserved sections of society, facilitating greater access to banking, credit, and insurance.
- Encourage public-private partnerships that enable the use of AI to promote financial literacy and access to banking services.
- Focus on integrating AI with government welfare schemes, ensuring efficient disbursement and monitoring of funds to the right beneficiaries, similar to China's integration of AI with social credit systems.

4. Harmonise AI Regulation with Data Protection Laws and Consumer Protection

Balancing AI innovation[60] with the need for data protection[61] and consumer rights[62] is a common challenge in both the EU and the U.S. India must establish regulatory guidelines that harmonise AI regulations with data protection frameworks and consumer protection laws. This will ensure that innovation does not compromise the privacy and security of consumers' financial information.

India should:

- Ensure that AI models used in the financial sector adhere to data privacy standards like encryption, data anonymisation, and secure data storage.
- Mandate transparency in AI decision-making processes, ensuring that consumers can easily understand how AI models affect their financial decisions.
- Set clear regulations on accountability and liability for AI-driven decisions in financial services, such as in lending, where AI algorithms can determine a person's creditworthiness.

5. Tackle Ethical AI Challenges and Bias

One of the challenges faced globally, particularly in the U.S. and EU, is the issue of AI bias. AI systems used in financial services must ensure fairness, transparency, and equity to avoid discrimination based on race, gender, or

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[60] Anil Kumar Yadav Yanamala et al., "Balancing Innovation and Privacy: The Intersection of Data Protection and Artificial Intelligence," *International Journal of Machine Learning Research in Cybersecurity and Artificial Intelligence* 13, no. 1 (2022): 1-43, http://ijmlrcai.com/index.php/Journal/article/view/23.

[61] Grzegorz Mazurek and Karolina Małagocka, "Perception of Privacy and Data Protection in the Context of the Development of Artificial Intelligence," *Journal of Management Analytics* 6, no. 4 (2019): 344-64, https://doi.org/10.1080/23270012.2019.1671243.

[62] Agnieszka Jabłonowska et al., " Consumer Law and Artificial Intelligence: Challenges to the EU Consumer Law and Policy Stemming from the Business' Use of Artificial Intelligence - Final Report of the ARTSY Project" (*EUI Department of Law Research Paper* No. 2018/11, European University Institute, 2018), http://dx.doi.org/10.2139/ssrn.3228051.

socioeconomic background. For instance, algorithms used in credit scoring should be rigorously tested to avoid reinforcing existing biases.
India can:

- Implement audits for AI fairness to ensure algorithms are not inadvertently biased.
- Promote diverse AI training datasets that better reflect India's diverse population and socio-economic conditions.
- Establish regulatory bodies to monitor AI algorithms for potential biases and unethical practices, ensuring that AI does not disproportionately disadvantage marginalised groups.

6. Collaborate with Global Regulatory Bodies

Given that AI technologies transcend borders, India should actively engage with international regulatory bodies to ensure that its AI regulations align with global standards. This would help Indian financial institutions comply with international standards, especially in cross-border financial transactions.
India should:

- Participate in international dialogues on AI ethics and regulations, particularly with organisations such as the Organisation for Economic Co-operation and Development (OECD) and the Financial Stability Board.
- Align its AI regulations with international standards to promote trust and improve interoperability in the global financial market.

IV. CONCLUDING REMARKS

India must undertake stakeholder-specific measures for AI developers, regulators, and policymakers that balance innovation with accountability, ensuring secure and inclusive AI-driven financial governance. AI developers must adopt ethical-by-design frameworks (e.g., bias audits and explainable AI) and align with global standards such as the NIST AI RMF. Collaboration with regulators via sandbox testing for high-risk tools (e.g., credit scoring) ensures innovation while mitigating risks, fostering trust in AI-driven financial services, and complying with evolving sector-specific guidelines.

Regulators should establish co-regulatory SROs to oversee high-risk AI applications (e.g., fraud detection), mandate risk-tiered compliance inspired by the EU AI Act and create a dedicated AI unit for enforcement. Harmonising AI governance with India's DPDP Act and RBI guidelines ensures accountability without stifling fintech growth. Policymakers must enact binding regulations to address systemic risks (e.g., AI-driven lending), amend existing laws (e.g., the RBI Act), and fund AI literacy programs. Aligning with global frameworks (the EU AI Act, OECD Principles) ensures interoperability, while stakeholder

collaboration balances innovation with consumer protection, thereby securing India's position in ethical AI governance.

This paper analysed existing legal frameworks and proposed a three-tiered regulatory approach for AI, i.e., self-regulation, co-regulation, and binding regulation based on insights from experts, scholars, and banking customers. Self-regulation fosters industry-driven AI governance, co-regulation balances flexibility with oversight, and binding regulation ensures compliance with ethical and risk-management standards. A robust AI governance framework that integrates stakeholder collaboration and international best practices is essential for mitigating risks while fostering financial innovation. Establishing a dedicated AI regulatory unit within RBI or SEBI will enhance oversight, ensuring that India's AI-driven financial sector remains secure, transparent, and inclusive, and that regulatory policies align with technological advancements. To foster balanced innovation and accountability for AI integration in India's financial sector. Stakeholder-specific measures include: (1) AI developers adopting ethical-by-design practices (e.g., bias audits) aligned with standards like the NIST AI RMF; (2) regulators (RBI/SEBI) establishing sector-specific oversight bodies and a dedicated AI unit for high-risk applications (e.g., fraud detection); and (3) policymakers enacting binding rules for systemic risks and fostering global alignment with EU/OECD frameworks. Self-regulation empowers industry-led governance, co-regulation blends flexibility with accountability, and binding rules enforce compliance. By integrating these layers, India can ensure secure, transparent, and inclusive AI-driven financial growth while mitigating risks.

However, despite its contributions, this study is constrained by its reliance on publicly available regulatory documents and expert interviews and is limited to India's domestic framework, which may limit insights into cross-border AI governance. The study may not apply to cases outside the jurisdiction of the Indian legal system. Stakeholder perspectives, though diverse, were restricted to legal and financial experts, potentially overlooking grassroots consumer challenges in AI-driven financial services.

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APPENDIX A.

Table A1.
Questions asked to the experts during interview

Q. No.	Questions asked during interview.
1	Do you believe the existing legal framework is sufficient to regulate AI in the financial sector, or is a new, AI-specific regulatory model required?
2	What are the most significant risks associated with AI-driven financial services, and how should regulations address these risks effectively?
3	Which regulatory approach—self-regulation, co-regulation, or binding regulation—do you think is most suitable for AI in finance, and why?
4	How can AI regulations balance financial innovation with consumer protection and data privacy in India's financial sector?
5	What role should regulatory bodies like RBI and SEBI play in AI governance, and how can collaboration with industry stakeholders improve regulatory effectiveness?

APPENDIX B.

Table B1.
Survey questionnaire.

Q. No.	Questions asked to the participants of survey.
1	Do you believe that India's existing legal framework is sufficient to regulate AI in the financial sector? (Yes/No)
2	Should financial institutions be allowed to regulate AI through self-regulation without government intervention? (Yes/No)
3	Do you think a co-regulatory approach, involving collaboration between industry stakeholders and regulators, is the best way to govern AI in finance? (Yes/No)
4	Should India implement binding regulations with strict licensing, monitoring, and enforcement mechanisms for AI-driven financial services? (Yes/No)

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