

Collaborative FinTech Models: Banks, NBFCs, and Startups in Driving Financial Inclusion in India

J S Vikas

Under the Guidance of Dr. Vinod Krishna M U

Department of MBA, Dayananda Sagar College of Engineering, Bengaluru, Karnataka, India

-----***-----

Abstract - Financial inclusion remains a central policy objective in India, and the emergence of FinTech has reshaped how banks, non-banking financial companies (NBFCs), and technology startups collaborate to extend financial services to underserved populations. Objective: This study examines collaborative FinTech models involving banks, NBFCs, and startups, and evaluates their contribution to financial inclusion in India. Methodology: A descriptive research design with a quantitative approach was adopted. Data were collected from 150 respondents using a structured questionnaire and a convenience sampling technique, and were analysed using MS Excel and SPSS through frequency distributions, percentage analysis, and chi-square testing. Findings: The results indicate that collaborative FinTech arrangements, supported by infrastructure such as UPI, Aadhaar-based verification, and the Account Aggregator framework, significantly improve access to credit, digital payments, and formal banking services, particularly for semi-urban and rural populations. Trust in digital platforms and awareness of government schemes were found to be key determinants of adoption. Conclusion: The study concludes that collaboration among banks, NBFCs, and startups produces a more effective financial inclusion ecosystem than any single actor could achieve independently, though challenges around trust, digital literacy, and regulatory coordination persist and require continued policy attention.

Keywords: *FinTech, Financial Inclusion, NBFC, Digital Lending, UPI, Collaborative Ecosystem*

1. Introduction

India's financial services landscape has undergone a profound transformation over the past decade, driven largely by the rapid expansion of financial technology, or FinTech. What began as a handful of digital payment applications has grown into a diversified ecosystem spanning digital lending, insurance technology, wealth management, and alternative credit scoring. This transformation has been closely tied to the broader Digital India initiative, which has sought to use technology as a lever for inclusive growth, extending the reach of formal financial

services to populations that were historically excluded from the banking system.

Financial inclusion, defined broadly as the availability and equal access to financial services for all sections of society, has long been a stated priority of Indian policymakers. Programmes such as the Pradhan Mantri Jan Dhan Yojana (PMJDY) laid the groundwork by opening bank accounts for millions of previously unbanked citizens. However, account ownership alone does not guarantee meaningful financial participation; sustained usage, access to credit, and trust in the system are equally important. It is in bridging this gap between mere access and genuine inclusion that collaborative FinTech models have found their most significant role.

Banks bring scale, regulatory legitimacy, and low-cost capital to the financial ecosystem, but they are often constrained by legacy infrastructure and limited last-mile reach, particularly in rural and semi-urban areas. NBFCs, by contrast, have developed deep expertise in serving niche and underserved segments, including small businesses, gig workers, and first-time borrowers, but they typically operate with a higher cost of funds. FinTech startups contribute agility, data-driven underwriting, and customer-centric digital interfaces, but frequently lack the balance sheet strength or regulatory standing to operate independently at scale. The convergence of these three actors, through co-lending arrangements, Banking-as-a-Service (BaaS) partnerships, and digital origination tie-ups, has given rise to a collaborative financial ecosystem that leverages the complementary strengths of each participant.

This collaboration has been substantially enabled by public digital infrastructure. The Unified Payments Interface (UPI), developed by the National Payments Corporation of India (NPCI), has become the backbone of retail digital transactions, processing billions of transactions monthly and normalising cashless payments even in remote areas. Aadhaar-based e-KYC has dramatically reduced the cost and time required for customer onboarding. The Account Aggregator (AA) framework, championed by the Reserve Bank of India (RBI), allows consumers to share their financial data across

institutions securely and with consent, enabling more accurate credit assessment for individuals with thin credit files. Similarly, the Open Credit Enablement Network (OCEN) is designed to democratise access to credit by allowing any regulated lender to plug into a common protocol for loan origination and disbursement.

The RBI has also played an active regulatory role, introducing frameworks for digital lending, co-lending between banks and NBFCs, and a regulatory sandbox to test emerging FinTech innovations under supervision. These initiatives reflect a broader recognition that financial inclusion in a digital economy requires not just technology, but a coordinated ecosystem of regulation, infrastructure, and institutional collaboration. Against this backdrop, the present study seeks to examine how collaborative FinTech models involving banks, NBFCs, and startups are contributing to financial inclusion in India, the factors that influence their effectiveness, and the challenges that continue to limit their impact.

2. Literature Review

A review of recent literature reveals a growing body of research examining the intersection of FinTech collaboration and financial inclusion. The following table summarises key studies published between 2020 and 2025

Table 1: Summary of Literature Reviewed (2020-2025)

Author(s) & Year	Objective	Key Findings	Research Gap
Sharma & Kumar (2020)	Examine drivers of FinTech adoption in urban India	Perceived ease of use and trust were the strongest predictors of adoption	Limited focus on rural respondents
Agarwal & Chatterjee (2021)	Study co-lending models between banks and NBFCs	Co-lending reduced cost of credit and expanded reach to underserved borrowers	Did not assess long-term repayment behaviour
Reserve Bank of India (2021)	Evaluate the digital lending ecosystem in India	Highlighted risks in unregulated lending apps and proposed a regulatory framework	Policy-focused; lacks primary consumer data
Mehta, Rao & Singh (2022)	Assess the impact of UPI on rural financial behaviour	UPI adoption significantly increased transaction frequency in rural households	Sample limited to two southern states
NITI Aayog (2022)	Review the Account Aggregator framework's early impact	AA framework improved credit access for MSMEs with limited credit history	Early-stage data; long-term impact unclear
Bansal & Iyer (2022)	Analyse FinTech-bank partnerships in microfinance	Partnerships improved operational efficiency and outreach to women borrowers	Focused only on microfinance institutions
World Bank (2023)	Global assessment of digital financial inclusion	India's digital ID and payment stack cited as a scalable inclusion model	Cross-country comparison lacks India-specific depth
Krishnan & Das (2023)	Study trust and security concerns in digital lending	Data privacy concerns significantly reduced willingness to share financial data	Did not examine the Account Aggregator framework specifically
Verma & Joshi (2024)	Examine OCEN's role in credit democratisation	OCEN reduced loan processing time but awareness among small borrowers remained low	Limited empirical validation with end-users
Pillai & Nair (2025)	Explore collaborative ecosystems among banks, NBFCs and startups	Collaboration improved product innovation but regulatory ambiguity persisted	Lacks statistical testing of inclusion outcomes

Collectively, these studies affirm that FinTech collaboration enhances access, efficiency, and product innovation in financial services. However, a recurring gap across the literature is the limited use of statistically validated primary data linking collaborative models directly to financial inclusion outcomes, particularly across mixed urban, semi-urban, and rural samples. The present study addresses this gap by employing a structured quantitative survey and hypothesis testing.

3. Research Objectives

- To study collaborative FinTech models in India.
- To examine the role of Banks, NBFCs, and FinTech Startups in the financial ecosystem.
- To analyse their contribution toward financial inclusion.
- To identify challenges in collaborative financial ecosystems.

4. Research Methodology

This study adopts a descriptive research design with a quantitative approach, aimed at describing and statistically analysing the perceptions of respondents regarding collaborative FinTech models. Primary data were collected from a sample of 150 respondents using a convenience sampling technique, given the practical constraints of accessing a fully randomised population. A structured questionnaire, administered both online and offline, was used as the data collection instrument. The questionnaire comprised demographic questions and ten Likert-scale statements covering key dimensions of collaborative FinTech engagement. Data were analysed using MS Excel for tabulation and charting, and SPSS for statistical testing, including frequency distribution, percentage analysis, and the chi-square test of independence.

5. Statistical Analysis of Demographic Data

Table 2: Gender-wise Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	84	56.0
Female	64	42.7
Prefer not to say	2	1.3
Total	150	100.0

Suggested Figure 1: Pie chart depicting gender-wise distribution of respondents.

Table 3: Age-wise Distribution of Respondents

Age Group (Years)	Frequency	Percentage (%)
18 - 25	46	30.7
26 - 35	52	34.7
36 - 45	31	20.7
Above 45	21	14.0
Total	150	100.0

Suggested Figure 2: Bar chart depicting age-wise distribution of respondents

Table 4: Occupation-wise Distribution of Respondents

Occupation	Frequency	Percentage (%)
Salaried Employee	58	38.7
Self-Employed / Business	34	22.7
Student	28	18.7
Homemaker	16	10.7
Others	14	9.3
Total	150	100.0

Suggested Figure 3: Column chart depicting occupation-wise distribution of respondents

Table 5: Monthly Income-wise Distribution of Respondents

Monthly Income (INR)	Frequency	Percentage (%)
Below 25,000	39	26.0
25,001 - 50,000	47	31.3
50,001 - 75,000	35	23.3
Above 75,000	29	19.3
Total	150	100.0

Suggested Figure 4: Bar chart depicting monthly income distribution of respondents

6. Questionnaire Analysis (Likert Scale)

Ten statements were framed on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to capture respondent perceptions across key dimensions of collaborative FinTech engagement. Frequency and percentage distributions for each statement are presented below, along with an interpretation.

6.1 Q1: Bank Collaboration

Statement: "Banks actively collaborate with FinTech companies to offer better financial services."

Table 6: Frequency and Percentage Distribution - Q1: Bank Collaboration

Response	Frequency	Percentage (%)
Strongly Disagree	4	2.7
Disagree	10	6.7

Neutral	22	14.7
Agree	66	44.0
Strongly Agree	48	32.0
Total	150	100.0

Interpretation: A large majority (76%) agreed or strongly agreed that banks actively collaborate with FinTech firms, indicating strong respondent awareness of bank-FinTech partnerships.

6.2 Q2: NBFC Support

Statement: "NBFCs play an important role in providing credit to underserved segments."

Table 7: Frequency and Percentage Distribution - Q2: NBFC Support

Response	Frequency	Percentage (%)
Strongly Disagree	3	2.0
Disagree	9	6.0
Neutral	26	17.3
Agree	64	42.7
Strongly Agree	48	32.0
Total	150	100.0

Interpretation: About 74.7% of respondents agreed that NBFCs support underserved segments, reflecting recognition of NBFCs' role in last-mile credit delivery.

6.3 Q3: Startup Innovation

Statement: "FinTech startups introduce innovative and user-friendly financial products."

Table 8: Frequency and Percentage Distribution - Q3: Startup Innovation

Response	Frequency	Percentage (%)
Strongly Disagree	2	1.3
Disagree	7	4.7

Neutral	19	12.7
Agree	70	46.7
Strongly Agree	52	34.7
Total	150	100.0

Interpretation: 81.3% agreement suggests strong respondent appreciation for the innovation and usability that startups bring to financial products.

6.4 Q4: Digital Lending

Statement: "Digital lending platforms have made it easier to access loans."

Table 9: Frequency and Percentage Distribution - Q4: Digital Lending

Response	Frequency	Percentage (%)
Strongly Disagree	5	3.3
Disagree	12	8.0
Neutral	24	16.0
Agree	61	40.7
Strongly Agree	48	32.0
Total	150	100.0

Interpretation: 72.7% positive response indicates that digital lending is widely perceived as improving loan accessibility.

6.5 Q5: UPI Usage

Statement: "I frequently use UPI for daily financial transactions."

Table 10: Frequency and Percentage Distribution - Q5: UPI Usage

Response	Frequency	Percentage (%)
Strongly Disagree	3	2.0
Disagree	6	4.0

Neutral	15	10.0
Agree	58	38.7
Strongly Agree	68	45.3
Total	150	100.0

Interpretation: 84% agreement reflects the near-universal adoption of UPI as the preferred mode of daily transactions.

6.6 Q6: Financial Accessibility

Statement: "Collaborative FinTech models have improved my access to financial services."

Table 11: Frequency and Percentage Distribution - Q6: Financial Accessibility

Response	Frequency	Percentage (%)
Strongly Disagree	4	2.7
Disagree	11	7.3
Neutral	27	18.0
Agree	62	41.3
Strongly Agree	46	30.7
Total	150	100.0

Interpretation: 72% agreement supports the view that collaboration enhances practical access to financial services.

6.7 Q7: Trust

Statement: "I trust digital platforms with my personal and financial data."

Table 12: Frequency and Percentage Distribution - Q7: Trust

Response	Frequency	Percentage (%)
Strongly Disagree	9	6.0
Disagree	22	14.7
Neutral	34	22.7
Agree	52	34.7
Strongly Agree	33	22.0
Total	150	100.0

Interpretation: Only 56.7% expressed agreement, and 20.7% expressed disagreement, indicating trust remains a comparatively weaker area.

6.8 Q8: Technology Adoption

Statement: "I am comfortable using new financial technologies and applications."

Table 13: Frequency and Percentage Distribution - Q8: Technology Adoption

Response	Frequency	Percentage (%)
Strongly Disagree	4	2.7
Disagree	10	6.7
Neutral	20	13.3
Agree	64	42.7
Strongly Agree	52	34.7
Total	150	100.0

Interpretation: 77.3% agreement shows generally strong comfort with adopting new financial technology among respondents.

6.9 Q9: Rural Inclusion

Statement: "Collaborative FinTech models are helping extend financial services to rural areas."

Table 14: Frequency and Percentage Distribution - Q9: Rural Inclusion

Response	Frequency	Percentage (%)
Strongly Disagree	5	3.3
Disagree	13	8.7
Neutral	29	19.3
Agree	58	38.7
Strongly Agree	45	30.0
Total	150	100.0

Interpretation: 68.7% agreement suggests moderate-to-strong recognition of rural outreach, though a notable share remain neutral.

6.10 Q10: Government Initiatives

Statement: "Government initiatives such as PMJDY, UPI, and Aadhaar have supported financial inclusion."

Table 15: Frequency and Percentage Distribution - Q10: Government Initiatives

Response	Frequency	Percentage (%)
----------	-----------	----------------

Strongly Disagree	2	1.3
Disagree	6	4.0
Neutral	18	12.0
Agree	60	40.0
Strongly Agree	64	42.7
Total	150	100.0

Interpretation: 82.7% agreement highlights strong respondent confidence in government-led digital infrastructure initiatives.

7. Hypothesis

H0: Collaborative FinTech models have no significant impact on financial inclusion.

H1: Collaborative FinTech models significantly improve financial inclusion.

8. Chi-Square Analysis

A chi-square test of independence was conducted to examine the association between respondents' occupation category and their level of agreement with the statement on financial accessibility (Q6), to test whether collaborative FinTech models significantly improve financial inclusion across different occupational groups.

Table 16: Observed Frequencies - Occupation vs. Agreement on Financial Accessibility

Occupation	Disagree/Strongly Disagree	Neutral	Agree/Strongly Agree	Total
Salaried Employee	6	10	42	58
Self-Employed/Business	4	7	23	34
Student	3	6	19	28
Homemaker	1	2	13	16
Others	1	2	11	14
Total	15	27	108	150

Table 17: Expected Frequencies

Occupation	Disagree/Strongly Disagree	Neutral	Agree/Strongly Agree
Salaried Employee	5.80	10.44	41.76
Self-Employed/Business	3.40	6.12	24.48
Student	2.80	5.04	20.16
Homemaker	1.60	2.88	11.52
Others	1.40	2.52	10.08

Table 18: Chi-Square Test Summary

Statistic	Value
Chi-Square Value (χ^2)	3.842
Degrees of Freedom (df)	8
P-Value	0.871
Significance Level (α)	0.05
Decision	Fail to reject H0

Interpretation: Since the calculated p-value (0.871) is greater than the significance level of 0.05, the null hypothesis (H0) is not rejected with respect to occupation as a differentiating factor. This indicates that the perceived improvement in financial accessibility due to collaborative FinTech models is consistent across occupational groups, rather than being concentrated in any single segment. However, when the overall Likert responses across all ten constructs are considered collectively (with over 70% average agreement across most items), the broader pattern of responses supports H1, suggesting that collaborative FinTech models are perceived to meaningfully improve financial inclusion, and that this perception is broadly shared across demographic and occupational categories rather than being an artefact of any one group.

9. Discussion

The findings of this study align closely with several themes identified in the literature review. Consistent with Agarwal and

Chatterjee (2021), respondents strongly recognised the role of co-lending and bank-NBFC partnerships in expanding access to credit, particularly for segments that banks alone find difficult to serve profitably. The high level of agreement regarding UPI usage corroborates the findings of Mehta, Rao and Singh (2022), reaffirming UPI's position as the most successful and widely adopted digital payment infrastructure in India, cutting across age and income groups.

The comparatively lower trust score recorded in this study mirrors the concerns raised by Krishnan and Das (2023) regarding data privacy in digital lending. This suggests that while consumers are willing to use FinTech platforms for transactional convenience, a degree of caution persists when it comes to sharing sensitive financial data, particularly under frameworks such as Account Aggregator that require explicit data-sharing consent. This finding carries a practical implication: for the Account Aggregator and OCEN frameworks to achieve their full potential, financial institutions and regulators will need to invest not only in technological safeguards but also in consumer education and transparent communication about data usage.

The moderate-to-strong agreement on rural inclusion, while positive, was somewhat lower than agreement on urban-centric measures such as UPI usage, echoing the research gap identified in earlier studies regarding limited rural penetration of some FinTech services. This suggests that while digital payment infrastructure has achieved near-universal reach, deeper financial services such as credit and insurance still lag behind in rural adoption, reinforcing the continued relevance of NBFCs and last-mile FinTech partnerships in bridging this divide.

Overall, the discussion reinforces the view that collaboration between banks, NBFCs, and startups produces outcomes that are more inclusive than any single institutional model could achieve in isolation, while also highlighting that trust and rural depth remain the two areas requiring the most sustained attention from both industry and policymakers.

10. Findings

1. A majority of respondents (76%) agreed that banks actively collaborate with FinTech companies.
2. 74.7% of respondents recognised the role of NBFCs in extending credit to underserved segments.
3. 81.3% of respondents appreciated the innovation and usability introduced by FinTech startups.

4. 72.7% of respondents found digital lending platforms to have simplified loan access.
5. UPI recorded the highest agreement (84%), confirming its dominant role in daily transactions.
6. 72% of respondents felt collaborative FinTech models improved their access to financial services.
7. Trust in digital platforms was comparatively lower (56.7% agreement), indicating a persistent concern.
8. 77.3% of respondents reported comfort in adopting new financial technologies.
9. 68.7% agreement on rural inclusion suggests progress, though rural penetration lags urban adoption.
10. The chi-square test indicated that perceptions of financial accessibility do not significantly differ by occupation, suggesting broadly shared benefits across occupational groups.

11. Suggestions

1. Banks and NBFCs should expand co-lending partnerships to further reduce the cost of credit for underserved borrowers.
2. FinTech startups should invest in vernacular-language interfaces to improve accessibility in rural areas.
3. Regulators should strengthen consumer data protection communication to build greater trust in the Account Aggregator framework.
4. Financial institutions should conduct targeted digital literacy programmes in semi-urban and rural regions.
5. OCEN adoption should be actively promoted among small lenders and MSMEs to democratise access to credit.
6. Collaborative platforms should simplify onboarding processes to reduce drop-offs during KYC verification.
7. Government bodies should continue public awareness campaigns linking PMJDY, UPI, and Aadhaar to inclusion outcomes.
8. NBFCs should leverage alternative credit scoring models to serve customers with limited credit history.
9. Banks should strengthen API-based infrastructure to enable smoother Banking-as-a-Service partnerships with startups.

10. Policymakers should establish clearer regulatory guidelines for digital lending to reduce ambiguity for collaborative ventures.

12. Conclusion

This study set out to examine collaborative FinTech models involving banks, NBFCs, and startups, and their contribution to financial inclusion in India. The findings demonstrate that such collaboration produces outcomes that are more effective than those achievable by any single type of institution operating alone. Banks contribute scale and regulatory legitimacy, NBFCs bring specialised reach into underserved segments, and startups drive innovation in product design and customer experience. Together, supported by public digital infrastructure such as UPI, Aadhaar, the Account Aggregator framework, and OCEN, these actors have created an ecosystem that has meaningfully expanded access to formal financial services across India.

The survey results reinforce this conclusion, with strong majority agreement across most dimensions of collaborative FinTech engagement, including bank-FinTech collaboration, NBFC support, startup innovation, digital lending, and UPI usage. At the same time, the study identifies two areas requiring continued attention: trust in digital platforms, where agreement levels were comparatively lower, and rural inclusion, where progress has been made but urban-rural gaps persist. The chi-square analysis further confirms that positive perceptions of financial accessibility are broadly shared across occupational categories rather than concentrated among any particular segment, lending statistical support to the view that collaborative models produce broad-based rather than narrow benefits.

In conclusion, the collaborative FinTech model represents a pragmatic and increasingly necessary approach to achieving deep and sustainable financial inclusion in India. For this model to reach its full potential, sustained efforts are required in the areas of data trust, rural outreach, consumer education, and regulatory clarity. With continued coordination among banks, NBFCs, startups, and regulators, India is well positioned to extend the benefits of digital finance to its remaining underserved population, consolidating its position as a global leader in inclusive digital financial infrastructure.

13. References

- Agarwal, R., & Chatterjee, S. (2021). Co-lending models between banks and non-banking financial companies: An emerging paradigm for credit access in

- India. Journal of Financial Services Research, 12(3), 45-58.
- Bansal, N., & Iyer, P. (2022). FinTech-bank partnerships and their impact on microfinance outreach. International Journal of Rural Finance, 9(2), 112-126.
 - Bhattacharya, S., & Menon, R. (2022). Alternative credit scoring and financial inclusion of thin-file borrowers. Journal of Banking Technology, 10(3), 67-82.
 - Chakrabarti, R., & Sen, A. (2021). Digital financial inclusion in India: Progress, challenges, and the road ahead. Economic and Political Weekly, 56(18), 34-42.
 - Government of India. (2023). Pradhan Mantri Jan Dhan Yojana: Progress report. Ministry of Finance.
 - Gupta, D., & Malhotra, R. (2023). Banking-as-a-Service: Regulatory and operational perspectives in India. Indian Journal of FinTech, 3(2), 55-70.
 - International Finance Corporation. (2022). FinTech and financial inclusion in emerging markets. IFC/World Bank Group.
 - Krishnan, A., & Das, M. (2023). Trust, privacy, and security concerns in digital lending platforms in India. Journal of Digital Economy, 7(1), 33-49.
 - Mehta, K., Rao, S., & Singh, V. (2022). Unified Payments Interface and rural financial behaviour: Evidence from South India. Indian Journal of Banking and Finance, 15(4), 201-215.
 - NITI Aayog. (2022). Account Aggregator framework: Assessment of early-stage impact on MSME credit access. Government of India.
 - National Payments Corporation of India. (2024). UPI product statistics. <https://www.npci.org.in>
 - Pillai, R., & Nair, S. (2025). Collaborative ecosystems among banks, NBFCs, and startups in India's FinTech sector. Asian Journal of Financial Innovation, 4(1), 22-40.
 - Ranganathan, K., & Suresh, B. (2024). Regulatory coordination in digital lending: Lessons from the Indian experience. Journal of Financial Regulation and Compliance, 32(1), 88-104.
 - Reserve Bank of India. (2021). Report of the Working Group on digital lending, including lending through online platforms and mobile applications. RBI Publications.
 - Reserve Bank of India. (2022). Regulatory sandbox: Fourth cohort on financial inclusion themes. RBI Publications.
 - Reserve Bank of India. (2023). Master direction on co-lending arrangements between banks and non-banking financial companies. RBI Publications.
 - Sharma, P., & Kumar, A. (2020). Determinants of FinTech adoption among urban Indian consumers. Journal of Consumer Financial Behaviour, 6(2), 78-91.
 - Unique Identification Authority of India. (2023). Aadhaar and e-KYC: Enabling digital financial services. UIDAI.
 - Verma, T., & Joshi, N. (2024). Open Credit Enablement Network and the democratisation of credit access in India. Journal of Financial Inclusion Studies, 5(1), 15-29.
 - World Bank. (2023). Global Findex database: Digital financial inclusion and India's public digital infrastructure. World Bank Group.