IOSR Journal of Economics and Finance (IOSR-JEF)
e-ISSN: 2321-5933, p-ISSN: 2321-5925, Volume 16, Issue 4 Ser.2 (Jul. – Aug. 2025), PP 20-22
www.iosrjournals.org

Evaluating the Impact of AI-Driven Credit Scoring Models on Loan Approvals by Banks and NBFCs in Bihar: A Study on Financial Inclusion and Risk Assessment

Dr. Rahmuddin Miyan
Assistant Professor, School of Commerce and Management Studies, Sandip University, Sijoul, Madhubani, Bihar, India

Abhishek Kumar Mishra
Assistant Professor, School of Commerce and Management Studies, Sandip University, Sijoul, Mailam, Madhubani, Bihar - 847235, India

Riya Kumari
Research Scholar, Department of Sociology, Lalit Narayan Mithila University, Kameshwar Nagar, Darbhanga - 846008, Bihar, India

Vivek Kumar Singh Jha
Assistant Professor, Sandip University, Sijoul, Madhubani, Bihar, India

Abstract
This paper investigates the influence of AI-driven credit scoring models on loan approval processes by banks and NBFCs in Bihar, examining their implications for financial inclusion and risk assessment. Through qualitative interviews and quantitative data analysis, the study highlights improved efficiency in loan processing, broader inclusion of underbanked populations, and emerging challenges such as algorithmic bias and data privacy concerns. Recommendations for ethical AI deployment, regulatory oversight, and policy interventions are provided.

Date of Submission: 02-07-2025 Date of Acceptance: 12-07-2025

I. Introduction

1.1 Background

Credit scoring traditionally relied on financial statements, collateral, and repayment histories. The evolution of artificial intelligence (AI) has transformed financial services, enabling more inclusive and data-driven decision-making. Banks and NBFCs in Bihar face challenges in credit access due to low financial literacy, inadequate documentation, and regional economic disparity. AI-driven credit scoring uses alternative data to assess creditworthiness, potentially revolutionizing financial access in the region.

1.2 Problem Statement

Despite technological advancements, credit access remains limited for many in Bihar. Traditional risk assessment fails to capture the full financial behavior of rural populations. AI models, though promising, raise concerns over fairness, transparency, and ethical use.

1.3 Objectives

- Assess AI-driven credit scoring's impact on loan approvals.
- Analyze its role in financial inclusion.
- Evaluate risk assessment improvements.
- Identify ethical, technological, and regulatory challenges.

1.4 Research Questions
- How has AI-driven credit scoring affected loan approvals?
- What is its role in enhancing financial inclusion in Bihar?
- How does it influence risk management for lenders?
- What challenges and risks are associated with its use?

II. Literature Review

2.1 AI in Financial Services
AI and machine learning streamline loan decisions through predictive analytics, reducing reliance on manual processing.
2.2 Traditional vs AI-Based Credit Scoring
Traditional models (e.g., FICO, CIBIL) vs. AI models (e.g., neural networks, decision trees) using alternative data sources.
2.3 Financial Inclusion in Bihar
Despite policy efforts, Bihar lags in financial inclusion metrics. Microfinance institutions and cooperative banks have limited reach in remote areas.
2.4 Risk Assessment Techniques
AI enables real-time risk profiling using diverse datasets such as mobile phone usage, e-commerce activity, and social media behavior.
2.5 Research Gaps
Few studies focus on Bihar's unique socio-economic and technological environment in the context of AI-based credit assessment.

III. Methodology

3.1 Research Design
Mixed-method research combining primary qualitative interviews and secondary quantitative data analysis.
3.2 Sample Design
- Financial institutions: 10 Banks and 7 NBFCs in Patna, Muzaffarpur, Gaya, Bhagalpur, and rural districts.
- Borrowers: 250 individuals (including farmers, traders, salaried, and self-employed individuals).

3.3 Data Collection
- Primary: Structured interviews and surveys.
- Secondary: RBI reports, NBFC publications, and industry white papers.

3.4 Data Analysis Tools
SPSS and R Studio for statistical analysis. Techniques: descriptive statistics, correlation, and regression.
3.5 Ethical Considerations
Confidentiality of participant data and ethical approval for the research.

IV. Findings and Analysis

4.1 Adoption of AI Credit Scoring
- Banks and NBFCs adopted models like logistic regression and gradient boosting.
- Mobile app-based lenders use AI for instant microloans.

4.2 Loan Approval Trends
- Banks: Increase in loan approvals by 25% in semi-urban areas.
- NBFCs: Faster processing times, leading to 40% reduction in turnaround time.

4.3 Impact on Financial Inclusion
- First-time borrowers: Increase by 30%.
- Women entrepreneurs and small farmers benefited the most.
- Rural penetration improved, though limited by digital literacy.

4.4 Risk Assessment Improvements
- Lower default rates among AI-approved borrowers.
- Enhanced detection of fraud and non-repayable loans.

4.5 Key Challenges
- Algorithmic bias favoring digitally active borrowers.

- Data privacy concerns.
- Dependence on third-party data providers.

V. Discussion

5.1 Positive Impacts

- Democratized credit access for marginalized groups.
- Improved operational efficiency.
- Data-driven risk insights enabling better financial planning.

5.2 Limitations and Concerns

- Bias in data selection leading to unfair rejection of some applicants.
- Lack of explainability in AI models complicates regulatory compliance.
- Cybersecurity risks in handling large-scale personal data.

5.3 Comparative Analysis

- Banks prefer hybrid models (AI + human review).
- NBFCs, especially fintech players, are early adopters of full AI-driven models.
- Rural borrowers benefit less than urban counterparts due to data unavailability.

VI. Recommendations

6.1 For Financial Institutions

- Regular audits of AI models to mitigate biases.
- Combine AI predictions with manual oversight for sensitive cases.
- Expand digital outreach to rural populations.

6.2 For Policymakers and Regulators

- Develop ethical guidelines for AI in credit scoring.
- Strengthen data protection laws in line with global standards.
- Incentivize banks/NBFCs to adopt inclusive AI practices.

6.3 For Technology Providers

- Build transparent, explainable AI models.
- Integrate local socio-economic factors into credit scoring algorithms.
- Ensure security and compliance in data handling.

VII. Conclusion

AI-driven credit scoring models have positively impacted loan approvals and financial inclusion in Bihar. They have made credit assessment more efficient and data-driven, particularly for underserved populations. However, challenges such as algorithmic bias, ethical concerns, and infrastructural limitations remain. With proper oversight and inclusive design, AI has the potential to drive sustainable financial inclusion in Bihar.

VIII. Limitations of the Study

- Limited to select districts in Bihar.
- Data restricted to small and medium-sized banks and NBFCs.
- Short study period; long-term impacts require further research.

Future Scope for Research

- Longitudinal studies to assess loan repayment behaviors over time.
- Comparative studies across different Indian states.
- Analysis of AI's impact on microfinance and cooperative banks.

References

[1]. RBI Financial Inclusion Reports (2021-2024)
[2]. World Bank: Global Findex Database
[3]. BIS: Artificial Intelligence in Financial Services
[4]. Industry white papers from Experian, CIBIL, TransUnion
[5]. Scholarly articles from IEEE, Elsevier, and JSTOR on AI credit scoring