Artificial Intelligence in Fintech: Transforming Financial Inclusion for Women Entrepreneurs

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Abstract

This study investigates the role of Artificial Intelligence (AI) in financial technology (fintech) and its impact on the financial inclusion of women entrepreneurs. It explores awareness, usage patterns, and the challenges faced in adopting AI-driven fintech tools. Primary data was collected through structured questionnaires and analyzed using statistical tests including chi-square, t-test, and correlation analysis. The findings suggest that while AI-fintech tools can significantly improve access to credit and financial decision-making, several barriers such as digital illiteracy, lack of awareness, and trust issues limit their adoption. The paper concludes with strategic recommendations for fintech developers, policymakers, and support organizations to enhance the inclusivity and accessibility of AI-powered financial services.

Keywords: Artificial intelligence, fintech, women entrepreneurs, financial inclusion, digital literacy

Introduction:

has revolutionized the financial sector by introducing faster, smarter, and more accessible services. From automated credit scoring and digital lending to AI-powered budgeting apps, fintech platforms have increasingly leveraged intelligent algorithms to provide customized financial solutions. While these innovations offer significant potential for all users, their relevance becomes even more critical for women entrepreneurs, who often face structural and systemic barriers in accessing finance through traditional banking systems.

Women-led businesses, especially in developing economies like India, continue to struggle with limited access to formal credit, lack of collateral, and a lack of financial literacy. According to various global and national studies, a significant gender gap exists in entrepreneurship due to insufficient financial inclusion. AI-enabled fintech tools present an opportunity to bridge this gap by offering alternative credit assessment models, user-friendly financial services, and mobile-based platforms that can reach underserved segments. These tools can play a pivotal role in democratizing access to finance, reducing biases, and accelerating the growth of women-led enterprises.

However, despite their potential, the adoption and awareness of AI-fintech services among women entrepreneurs remain relatively low. Barriers such as digital illiteracy, fear of cyber fraud, lack of trust, and limited access to digital infrastructure hinder the widespread adoption of these innovations. Understanding these gaps is essential for developing more inclusive and impactful fintech ecosystems.

This research aims to explore the level of awareness, usage, and impact of AI-fintech tools on financial inclusion among women entrepreneurs. It will also identify the challenges faced in adopting these tools and examine whether AI users experience greater access to credit and improved financial outcomes compared to non-users. By collecting primary data and analyzing it through suitable statistical methods, this study seeks to offer insights that can support fintech developers, policymakers, and women-focused organizations in building more inclusive, gender-sensitive, and effective digital financial solutions.

Objectives of the study

1. To assess the awareness and usage of ai-based fintech tools among women entrepreneurs.
2. To evaluate the impact of ai-powered financial services on access to credit and financial decision-making.
3. To identify the challenges faced by women entrepreneurs in adopting ai-enabled fintech services.

Review of literature : 10 peer-reviewed articles and reports were analyzed to understand the existing knowledge on AI in fintech and gendered access to finance. Studies highlight the transformative role of AI in personal finance but also point to the gender gap in digital adoption and financial literacy. While AI can remove human biases, it can also replicate them if algorithms are not designed inclusively.

Singh and Aggarwal (2022) studied the level of awareness and usage of AI-based fintech tools among small-scale women entrepreneurs in rural and semi-urban India. Using a structured questionnaire, they collected responses from 150 women business owners. The study revealed that most participants had limited knowledge of AI-driven digital tools like mobile banking, credit scoring apps, and robo-advisors. Poor digital literacy and lack of training programs were the main barriers identified. The authors emphasized that government and financial institutions should organize awareness and capacity-building workshops. They concluded that digital education and infrastructure are necessary to enhance fintech adoption and financial inclusion among women entrepreneurs.

Demirgüç-Kunt et al. (2018) analyzed data from the World Bank's Global Findex Database to understand how digital financial services promote financial inclusion worldwide. Their study found that AI-powered fintech solutions help women gain better access to banking, savings, and credit facilities. The findings indicated that digital tools are reducing the gender gap in financial access, especially in developing economies. They also highlighted that fintech adoption improves women's participation in the formal financial system. The researchers concluded that AI-based innovation in finance has a transformative role in empowering women financially across global markets.

Jagtiani and Lemieux (2019) explored how alternative data and machine learning models used in fintech lending platforms influence credit access. Their study used data from the Lending Club platform in the United States to examine whether AI systems could reduce gender bias in lending. The results showed that AI-based algorithms make more objective credit decisions than traditional methods. Women entrepreneurs benefited from improved chances of loan approval due to fairer data-driven evaluation. The authors concluded that AI-driven fintech has strong potential to promote equality and transparency in financial decision-making.

Narayan and Sahni (2021) examined how AI-based financial tools influence decision-making among women entrepreneurs in India. Using a mixed-method approach combining surveys and interviews, they found that AI tools such as robo-advisors and automated budgeting systems help users make smarter financial decisions. The study emphasized that these tools provide personalized advice and improve financial planning efficiency. However, it also noted that many women hesitate to use AI applications due to low confidence in technology. The authors suggested training and awareness programs to build trust and enhance AI literacy.

Kumar and Bansal (2020) explored the relationship between fintech usage and business growth in women-led startups in India. Their quantitative study surveyed 200 entrepreneurs across major cities. The findings revealed a strong positive correlation between the use of fintech apps and improved financial management, including cash flow, loan access, and payment tracking. Women using digital tools reported faster business growth and greater access to investors. The study concluded that fintech adoption not only supports daily operations but also encourages financial discipline and business scalability.

The PwC (2020) industry report focused on women entrepreneurs' perception of AI-enabled fintech platforms in India. The report collected data from both urban and semi-urban users to understand adoption barriers. It found that although many women recognize the benefits of AI in finance, concerns about data privacy, cyber fraud, and misuse of personal information prevent full adoption. The report also mentioned that trust in digital platforms is a key factor influencing user behavior. PwC recommended that fintech firms strengthen security frameworks and build transparent systems to enhance user confidence.

Sharma and Gupta (2021) studied the technological challenges faced by rural women entrepreneurs while adopting AI-based financial services. Using interviews and case studies, they found that poor internet connectivity, limited smartphone ownership, and low awareness about fintech tools restrict financial inclusion. The researchers highlighted that the rural digital divide remains a major obstacle to fintech growth. Their study suggested that improving digital infrastructure and organizing awareness campaigns can help overcome these challenges. The authors concluded that technological access must improve for AI-fintech to benefit all sections of society.

The IMF (2022) working paper emphasized the policy benefits of integrating AI into financial inclusion strategies. The study used comparative data from developing economies to assess how AI can help governments target underserved women entrepreneurs. It found that AI-driven credit scoring and risk assessment systems make financial services more inclusive and efficient. The paper also discussed how automation can personalize financial products for women-owned businesses. In conclusion, the IMF recommended that countries invest in AI-based tools to strengthen their digital financial ecosystems and reduce gender inequality.

Research gap:

While several studies have highlighted the role of fintech and AI in improving financial services and decision-making, there is still limited empirical research focusing specifically on women entrepreneurs' experiences with AI-driven fintech solutions. Most existing literature examines fintech adoption in general or broadly discusses digital financial inclusion without disaggregating data based on gender-specific challenges and opportunities. Furthermore, few studies employ primary data to assess the real-time awareness, adoption patterns, and impact of AI-powered financial tools among women entrepreneurs, especially in emerging economies like India. There is also a scarcity of research that explores barriers such as digital literacy, trust in AI systems, and infrastructure access from a gendered lens. This gap underscores the need for a comprehensive, data-driven investigation into how AI in fintech is perceived, accessed, and utilized by women entrepreneurs, and what specific interventions can bridge the inclusion gap.

Research methodology:

This study uses a descriptive quantitative approach to examine the impact of AI-based fintech on financial inclusion among women entrepreneurs. Primary data was collected through a structured Google Forms questionnaire targeting 100 women entrepreneurs selected via purposive sampling. The questionnaire covered demographic details, awareness and usage of AI-fintech tools, and perceived benefits and challenges. It included multiple-choice, yes/no, and Likert scale questions. Data collection was conducted online over a two-week period, ensuring voluntary participation and confidentiality. The collected responses were analyzed using Microsoft Excel and SPSS. Statistical methods applied include descriptive statistics to summarize responses, chi-square test to evaluate the relationship between awareness and financial inclusion, independent samples t-test to compare access to credit, and Spearman's correlation to assess confidence in financial decision-making. Ethical considerations such

as informed consent and data privacy were strictly followed to ensure the integrity of the research.

Hypotheses

H1: There is a significant relationship between awareness of ai-fintech tools and financial inclusion among women entrepreneurs.

H2: Women entrepreneurs who use ai-enabled fintech services experience improved access to credit compared to those who do not.

Data analysis :

The results show a positive correlation between awareness levels and financial inclusion. Out of the 100 respondents, 63% were aware of ai-based fintech tools, and among them, 78% reported that such tools helped improve their financial planning and access to credit. The chi-square test revealed a statistically significant association ($p < 0.05$) between awareness and usage of ai-fintech tools. Independent samples t-test showed that women entrepreneurs who used ai tools scored significantly higher in perceived access to credit compared to non-users. Spearman's rank correlation further indicated a moderate positive relationship between frequency of ai tool usage and financial confidence. Key challenges identified through frequency analysis included lack of training (55%), limited digital access (42%), and fear of misuse or fraud (39%).

Hypothesis test calculations:

Hypothesis 1 (h1): A chi-square test was conducted to determine the relationship between awareness of ai-fintech tools and financial inclusion.

Table no. 1 awareness of ai-fintech tools and financial inclusion

	Improved financial inclusion	No improvement	**Total**
Aware of ai tools	45	18	63
Not aware of ai tools	12	25	37
Total	57	43	100

From the table:
- Out of 63 women who were aware of ai-fintech tools, 45 reported improvements in financial inclusion.
- Out of 37 women who were not aware, only 12 reported improvements.

Expected frequencies and chi-square value were calculated as:

The chi-square statistic is 14.4625. The p-value is .000143. The result is significant at $p < .05$.

Since the p-value (0.000143) is less than 0.05, the result is statistically significant.

This means that the relationship between awareness of AI-fintech tools and financial inclusion is not due to chance. Therefore, Hypothesis 1 (H1) — "Awareness of AI-fintech tools significantly improves financial inclusion among women entrepreneurs" is supported.

Hypothesis 2 (h2): An independent samples t-test was used to compare the mean perceived access to credit between users and non-users of ai-fintech tools.

Table no. 2 comparison of credit access between users and non-users of ai-fintech tools

Group	Mean	Sd	N
Users	4.2	0.6	40
Non-users	3.6	0.7	40
T = 4.12	Df = 78	Critical value at p = 0.05	

Since 4.12 > 1.99, the difference in mean values is significant.

Therefore, hypothesis 2 (h2) — "users of ai-fintech tools have better access to credit compared to non-users" Is supported.

Hypothesis 1 (h1): Chi-square test results

Table no. 3 chi-square test

	Improved financial inclusion	No improvement	Total
Aware of ai tools	45	18	63
Not aware of ai tools	12	25	37
Total	57	43	100

Table no. 4 chi-square test summary

Chi-square (x²)	Degrees of freedom		Critical value (α = 0.05)		Result
14.49	1		3.841		Alternate hypothesis is accepted
Category	Improved (observed)	No improvement (observed)	Row total	Expected (improved)	Expected (no improvement)	Chi-square contribution
Aware	45	18	63	35.91	27.09	2.301 + 3.050
Not aware	12	25	37	21.09	15.91	3.918 + 5.193
Column total	57	43	100	—	—	X² = 14.46

Hypothesis 2 (h2): Independent samples t-test results

Table no. 5 independent samples t-test results

Group	Mean (access to credit)
Users	56
Non-users	44

Table no. 6 group comparison

Group	Mean (access to credit)	Standard deviation (sd)	Sample size (n)
Users	4.2	0.6	40
Non-users	3.6	0.7	40

Table no. 7 t-test summary

T-value	Degrees of freedom (df)	Critical value (α = 0.05)	Result
4.12	78	1.99	Alternate hypothesis is accepted
Statistic	**Value**		

Mean difference (users – non-users)	0.60
Standard error of difference	0.1458
T-value	4.12
Degrees of freedom (df)	78
Critical t (α = 0.05, two-tailed)	1.99
P-value	< 0.001
Pooled sd	0.652
Cohen's d	0.92 (large effect)
95% ci for mean difference	(0.31, 0.89)

Table no. 8 summary of findings

Hypothesis	Test used	Statistic	Critical value	Result	Conclusion
H1	Chi-square test	X^2 = 14.49	3.841	Alternate hypothesis is accepted	Awareness of ai-fintech tools is linked to financial inclusion.
H2	Independent t-test	T = 4.12	1.99	Alternate hypothesis is accepted	Ai-fintech users report better credit access than non-users.

Interpretation:
Both hypotheses are statistically supported:
- H1: Awareness of ai-fintech tools is significantly associated with improved financial inclusion (x^2 = 14.49 > 3.841).
- H2: Users of ai-fintech services have a higher means perceived credit access (4.2 vs. 3.6; t = 4.12 > 1.99).

These results highlight ai-fintech's potential to empower women entrepreneurs but also underscore the need to address barriers to adoption (e.g., digital literacy, trust).

Table no. 9 hypothesis test summary

Hypothesis	Test type	Variables / description	Results / findings
H1	Chi-Square Test	Independent Variable: Awareness of AI-fintech tools (Aware vs. Not Aware) Dependent Variable: Financial inclusion (Improved vs. No Improvement)	X^2 = 14.49, df = 1 Critical value = 3.841 (α = 0.05) Significant (X^2 > 3.841, p < 0.05)
H2	Independent t-Test	Independent Variable: Use of AI-fintech tools (Users vs. Non-users) Dependent Variable: Perceived access to credit (scale 1-5)	Users: Mean = 4.2 (SD = 0.6) Non-users: Mean = 3.6 (SD = 0.7) t = 4.12, df = 78 Significant (t > 1.99, p < 0.05)

Managerial Implications

The research findings present significant strategic opportunities for fintech companies, financial institutions, and policymakers. With 63% awareness of AI-fintech tools translating to 78% reporting improved financial planning, organizations should prioritize targeted awareness campaigns specifically designed for women entrepreneurs. The substantial difference in perceived credit access between users (4.2) and non-users (3.6) indicates that AI-fintech adoption directly correlates with business growth potential.

Financial service providers should develop gender-sensitive AI solutions that address the identified barriers of inadequate training (55%), limited digital access (42%), and security concerns (39%). Investment in comprehensive digital literacy programs becomes crucial, as awareness significantly correlates with adoption. Companies should establish dedicated support systems, including mentorship programs and simplified user interfaces, to reduce the learning curve for women entrepreneurs.

The moderate positive correlation between AI tool usage frequency and financial confidence suggests that sustained engagement drives better outcomes. Therefore, fintech firms should focus on creating sticky, user-friendly platforms with continuous educational resources. Strategic partnerships with women entrepreneur networks and business associations can facilitate wider reach and trust-building.

Policymakers should consider regulatory frameworks that encourage AI-fintech innovation while ensuring data protection and fraud prevention. Government initiatives promoting digital infrastructure development and subsidized training programs could accelerate adoption rates. The research demonstrates that bridging the awareness gap directly translates to enhanced financial inclusion, making targeted interventions economically viable and socially impactful for sustainable entrepreneurial ecosystem development.

Findings Based on Objectives

Objective 1: Awareness and Usage Assessment

The study reveals a moderate level of awareness among women entrepreneurs regarding AI-based fintech tools, with 63% of respondents demonstrating familiarity with these technologies. This awareness rate, while encouraging, indicates substantial room for improvement, particularly considering that 37% of women entrepreneurs remain unaware of potentially transformative financial tools. Among those aware of AI-fintech solutions, adoption patterns show promising engagement levels, with users reporting regular utilization of various AI-powered features including automated financial planning, credit scoring, and personalized investment recommendations.

The awareness-to-adoption conversion rate demonstrates positive momentum, suggesting that once women entrepreneurs understand the capabilities of AI-fintech tools, they are likely to integrate them into their business operations. However, the gap between awareness and universal adoption highlights the need for more comprehensive outreach and education initiatives specifically targeting women-led enterprises.

Objective 2: Impact on Credit Access and Financial Decision-Making

The quantitative analysis provides compelling evidence of AI-fintech's transformative impact on financial accessibility. The independent samples t-test results clearly demonstrate that users of AI-enabled fintech services experience significantly superior perceived access to credit compared to non-users, with mean scores of 4.2 versus 3.6 respectively. This 16.7% improvement in credit accessibility represents a substantial advancement in addressing one of the most critical challenges faced by women entrepreneurs.

Furthermore, the Spearman's correlation analysis reveals a moderate positive relationship between the frequency of AI tool usage and financial confidence, indicating that sustained engagement with these

technologies builds entrepreneurial competence over time. Among the 63% who were aware of AI-fintech tools, 78% reported tangible improvements in financial planning capabilities, suggesting that these technologies not only provide access to capital but also enhance overall financial literacy and strategic decision-making skills.

Objective 3: Adoption Challenges Identification

The research identifies three primary barriers hindering widespread AI-fintech adoption among women entrepreneurs. Lack of adequate training emerges as the most significant challenge, affecting 55% of respondents, highlighting the critical need for comprehensive digital literacy programs. Limited digital access affects 42% of participants, underscoring infrastructure and connectivity challenges that disproportionately impact women entrepreneurs, particularly in rural or underserved areas.

Security concerns, including fear of misuse or fraud, influence 39% of respondents, reflecting the importance of trust-building measures and robust cybersecurity frameworks. These challenges are interconnected, as inadequate training often amplifies security concerns, while limited digital access restricts opportunities for skill development and confidence building in AI-fintech utilization.

Conclusion

This study clearly shows that AI-based fintech tools can make a big difference in improving financial inclusion for women entrepreneurs. The results prove that women who are aware of and use these tools have better access to banking and credit facilities. Awareness of AI-fintech tools is strongly linked with higher financial inclusion, and users enjoy better financial planning and confidence in handling money matters. The study also found that many women still face barriers like lack of training, poor internet access, and fear of data misuse. These challenges need support from the government, fintech companies, and educational institutions to help more women benefit from digital finance. AI-fintech tools not only help individual businesswomen but also contribute to the overall growth of the economy. When more women gain access to financial services, it supports entrepreneurship and promotes equality. In the future, more research should study how long-term use of AI-fintech affects women's business growth and how training or awareness programs can increase adoption. Overall, this research highlights that technology, when used wisely and inclusively, can be a strong force for empowering women and building a more equal financial world.

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