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Digital Financial Inclusion through AI-Based FinTech Services: Evidence from Emerging Markets

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ABSTRACT

Financial inclusion is much discussed and very important from economy perspective. Government and administration has taken many steps like Jan Dhan Yojana, Mudra Yojana, Suraksha Bima Yojana, Atal Pension Yojana etc. These initiatives have helped in increasing financial inclusion and bringing unbanked population under banking population. However now a day Digital Financial inclusion is also important. Many financial institutions with the advent of Digital tools and Artificial Intelligence are coming up with innovative ways of investing and saving. These tools can be accessible to people who are moderately digital literate. Many people use such platforms for investing money. This has led to increase investments in non-conventional investment avenues such as Stock market, Mutual Fund, Digital gold and silver. This study was undertaken with sole aim to investigate the role of AI driven Financial Technology in promoting access to financial services for under-represented communities. To fulfil this objective data was gathered from individuals using Questionnaire. 317 people who are moderately aware of such fintech services responded to the questionnaire. The questionnaire is found to be reliable. The data analysis confirmed that AI enabled fintech services such as digital payments, robo-advisory platforms, automated credit scoring systems, and tailored financial advice leads to enhanced financial inclusion. Recommendations and limitations are discussed in the paper.

Keywords: Digital Financial Inclusion, Artificial Intelligence, FinTech, Emerging Markets, Financial Literacy, AI Adoption, Financial Innovation

INTRODUCTION

In recent years, the Financial Services (FinServ) sector has experienced substantial transformation owing to the swift advancement of digital technologies. The emergence of financial technology (FinTech) is a significant advancement, enhancing the accessibility, speed, and cost-efficiency of financial services. In emerging nations, FinTech has significantly advanced digital financial inclusion with innovative solutions like mobile payments, online lending, and digital investing platforms. The usage of Artificial Intelligence (AI) into FinTech has augmented its functionalities through automation, personalisation, and data-driven decision-making.

Digital financial inclusion denotes the accessibility and utilisation of cost-effective FinServ for all individuals, particularly those historically marginalised from the official financial system. Notwithstanding several initiatives by governments and organisations like the World Bank and the Reserve Bank of India, a significant portion of the populace in emerging economies remains devoid of fundamental financial services. Conventional banking institutions frequently encounter obstacles including elevated operational expenses, restricted accessibility in rural regions, and stringent documentation prerequisites. Consequently, numerous individuals remain unbanked or underbanked.

AI-driven financial technology services have surfaced as a viable remedy to tackle these issues. Machine learning, big data analytics, and automated credit scoring structures can offer custom-made financial advice, augment risk evaluation, and elevate consumer experience. Consequently, they possess the capacity to markedly enhance financial inclusion by rendering FinServ more accessible, efficient, and user-centric.

Nonetheless, despite these benefits, certain challenges hinder the effective implementation and influence of AI-driven finance services. A multitude of users continues to encounter obstacles including distrust, apprehensions over data

privacy and security, inadequate digital literacy, and insufficient awareness of FinTech services. Moreover, there are apprehensions over algorithmic bias and inequitable access to digital infrastructure, especially in semi-urban and rural regions. These problems may diminish user confidence and impede the adoption of FinTech solutions.

A significant problem is the inadequate comprehension of how AI-driven FinTech services affect user behaviour and financial decision-making. Although current studies mostly emphasise technology innovations and macro-level results, there is a deficiency of empirical study investigating how individual consumers embrace new services and how their financial behaviours evolve consequently. This generates a void in the literature, particularly for emerging markets.

This study investigates the role of AI-driven FinTech services in advancing digital financial inclusion. The objective is to examine the impact of perceived utility, trust, and financial literacy on user uptake, as well as the effect of these services on financial decision-making behaviour. The research aims to identify principal obstacles and offer pragmatic recommendations for enhancing the efficacy of AI-driven financial solutions.

In conclusion, whereas AI-driven FinTech services present considerable prospects for improving financial inclusion, their efficacy relies on consumer acceptance, trust, and accessibility. Confronting these problems is crucial to guarantee that the advantages of digital FinServ extend to all societal segments and foster inclusive economic growth.

LITERATURE REVIEW

Digital financial inclusion has emerged as a primary concern for policymakers and scholars, especially in developing economies where a substantial segment of the population is inadequately served by conventional banking institutions. Financial inclusion denotes the accessibility and use of economical financial services, including savings, credit, insurance, and payment mechanisms, for all persons, particularly those from marginalised communities. The World Bank (2021) asserts that access to FinServ is essential for alleviating poverty, fostering economic empowerment, and promoting equitable growth. Traditional banking systems frequently encounter obstacles including elevated operational expenses, insufficient physical infrastructure, and rigorous documentation prerequisites, which constrain their reach. The advent of digital FinServ has facilitated the resolution of these obstacles by utilising technology to provide financial solutions more efficiently and at reduced costs (Demirgüç-Kunt et al., 2018).

The advancement of financial technology (FinTech) has profoundly altered the FinServ sector through the introduction of innovative, technology-based solutions. FinTech includes many applications such as mobile banking, digital payments, peer-to-peer lending, and online investment platforms. Research by Arner et al. (2015) indicates that FinTech diminishes transaction costs, increases accessibility, and promotes the efficiency of financial service provision. In emerging nations, FinTech has been pivotal in connecting financial institutions with underprivileged populations by offering digital alternatives to conventional banking. Mobile-based FinServ have facilitated access to financial goods for millions of unbanked persons, hence enhancing financial inclusion (Jack & Suri, 2014). Moreover, the swift expansion of digital payment systems and government initiatives, especially in nations like India, bolstered by entities such as the Reserve Bank of India, has expedited the use of digital financial services.

The incorporation of Artificial Intelligence (AI) into FinTech has significantly augmented its capacity to promote financial inclusion. Artificial intelligence technologies, including machine learning, big data analytics, and natural language processing, empower financial organisations to scrutinise extensive information and produce predicted insights, thus enhancing decision-making processes. Bughin et al. (2017) assert that AI can markedly enhance efficiency and innovation in FinServ through automation and personalisation. A significant application of AI in FinTech is automated credit scoring, which utilises alternative data sources, including transaction history, mobile usage, and behavioural data, to evaluate creditworthiness. Research conducted by Jagtiani and Lemieux (2018) demonstrates that AI-driven credit models enhance credit accessibility for persons lacking official credit histories, therefore fostering financial inclusion. Furthermore, AI-driven robo-advisory platforms offer tailored investment guidance at reduced costs, hence rendering wealth management services more accessible to a wider demographic (Sironi, 2016).

The adoption of AI-driven FinTech services by users is a vital factor influencing their success and effect on financial inclusion. Davis (1989), posits that perceived usefulness and ease of use substantially affect humans' propensity to accept new technologies. Empirical research indicates that trust, security, ease, and perceived advantages significantly influence user acceptance of FinTech services (Lee & Shin, 2018). Financial literacy significantly impacts adoption behaviour, as consumers with greater financial understanding are more inclined to utilise digital FinServ efficiently (Lusardi & Mitchell, 2014). Furthermore, AI-driven personalisation improves user experience by delivering customised financial suggestions, hence augmenting customer engagement and happiness.

AI-driven FinTech platforms have been shown to affect financial decision-making by offering real-time data and tailored recommendations. Behavioural finance theories indicate that individuals frequently make irrational financial choices owing to cognitive biases and insufficient information. Thaler and Sunstein (2008) developed the concept of "nudging," wherein digital platforms subtly influence users to make improved financial decisions. AI-driven FinTech

applications utilise behavioural data to promote beneficial financial practices, like consistent saving, budgeting, and smart investing choices. These platforms enhance financial literacy by offering consumers accessible financial information and instructional resources (Hastings et al., 2013). Consequently, users are more adept at making educated financial decisions, thereby improving their overall financial well-being.

Notwithstanding the considerable advantages of AI-driven FinTech services, various obstacles impede their extensive acceptance and efficacy. A primary worry is data privacy and security, as FinTech systems depend significantly on extensive amounts of personal and financial information. The World Economic Forum (2020) emphasises that the growing use of digital technology in FinServ subjects' customers to threats like data breaches, identity theft, and cyberattacks. O'Neil (2016) contends that these prejudices can perpetuate existing disparities and hinder the objective of financial inclusion. The digital gap continues to be a substantial obstacle, especially in rural and semi-urban regions where access to digital infrastructure and digital literacy is constrained (van Dijk, 2020). These problems underscore the necessity for a balanced strategy that integrates technology advancement with ethical considerations and inclusive policy.

Regulatory frameworks and policy interventions are essential for the sustainable development of AI-driven FinTech ecosystems. Regulatory authorities, including the Reserve Bank of India, have instituted numerous initiatives to advance digital financial inclusion while safeguarding consumer protection and maintaining financial stability. Regulatory sandboxes permit FinTech companies to evaluate innovative solutions inside a regulated setting, fostering innovation while mitigating risks (Arner et al., 2017). Policymakers must prioritise the fortification of data protection regulations, the enhancement of digital infrastructure, and the promotion of financial literacy initiatives to optimise the advantages of AI-driven FinTech services. Cooperative initiatives involving governments, financial entities, and technology suppliers are crucial for establishing an inclusive and safe digital financial environment.

A deficiency persists in empirical research examining user-level behavioural consequences and the influence of AI on financial decision-making in emerging countries. Most studies have employed a macro-level approach, with little focus on individual user experiences and adoption behaviours. Consequently, further study is required to amalgamate technological, behavioural, and policy aspects to achieve a thorough comprehension of the influence of AI-driven FinTech on financial inclusion.

Research Objectives

After careful review of literature following objectives were set for the study.

1. To inspect the role of AI-based FinTech services in improving digital financial inclusion.
2. To analyse the impact of AI-driven FinTech services on user adoption.
3. To identify the major challenges affecting the adoption of AI-based FinTech services.

Research Hypotheses

Hypotheses for Financial Inclusion

H1: AI-based FinTech services significantly Influence digital financial inclusion.

Hypotheses for User Adoption

H2: Perceived usefulness of AI-based FinTech services positively influences user adoption.

H3: Trust and security significantly influence user adoption of AI-based FinTech services.

Research Methods

Research Instrument was developed after critical review of past studies. The instrument was developed using Five point Likert's scale. Respondents were asked to rate their agreement for the statement. More than 800 individual working professional. Out of them 140 rejected the request of responding, 343 were not at all aware of or not using AI- based FinTech Services. Therefore, the final sample size considered for the analysis is 317. Analysis of data is done using SPSS.

RESULTS

Respondents Profile

Variable	Category	Frequency	Percentage (%)
Gender	Male	182	57.4
	Female	135	42.6
Age Group (Years)	18–25	96	30.3
	26–35	128	40.4
	36–45	62	19.6
	Above 45	31	9.8
Education	Graduate	134	42.3
	Postgraduate	121	38.2
	Diploma	38	12.0
	Others	24	7.6

Occupation	Salaried	194	61.2
	Self-employed	99	31.2
	Business	24	7.6
Monthly Income	Below ₹25,000	58	18.3
	₹25,000 – ₹50,000	102	32.2
	₹50,001 – ₹1,00,000	109	34.4
	Above ₹1,00,000	48	15.1
	Semi-Urban	119	37.5

Reliability Statistics

Construct	N	Cronbach's α
AI-based FinTech Services	5	0.822
Digital Financial Inclusion	5	0.761
Perceived Usefulness	4	0.816
User Adoption	5	0.789
Trust & Security	4	0.854

Since Cronbach's Alpha for each construct is greater than 0.7; it is considered reliable. Hence overall questionnaire is considered reliable.

Hypotheses Testing

H1: AI-based FinTech services significantly Influence digital financial inclusion.

Model

Model	R	R^2	Adjusted R^2	S.E.
1	0.642	0.412	0.408	0.521

Adjusted R square value suggested that the model explains 40% variance. It is a good indication.
To check if this model has significant explanatory power ANOVA table is observed

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regr.	58.424	1	58.424	214.67	***
Residual	82.723	318	0.262		
Total	141.600	319			

(***= p<0.5)
Since significance values is less than .05 (F=214.67; p<.05); the model is said to have a significant explanatory power.
To check the magnitude of impact of AI-based FinTech services on digital financial inclusion coefficient table is observed

Coefficient Table

Model	Unstd. Coefficient (B)	Std. Error	Std. Coefficient (Beta)	t	Sig.
(Constant)	1.214	0.198	—	6.13	0.000
AI-based FinTech Services	0.587	0.040	0.642	14.65	0.000

From coefficient table it is observed that unstandardized coefficient is 0.587. It indicates that as 1 unit of AI based FinTech Services' perception increases 0.587-unit digital inclusion increases. The result (p<.05) shows that this impact is not just by chance. It is statistically significant. Therefore, we accept H1.

H2: Perceived usefulness of AI-based FinTech services positively influences user adoption.

Model Summary

Model	R	R^2	Adjusted R^2	SE
1	0.701	0.491	0.487	0.468

Model Summary suggests that about 49% variance in dependent variable are explained by this model.

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regr.	72.845	1	72.845	332.18	***
Residual	75.755	318	0.238		
Total	148.600	319			

(***= p<0.5)
Since significance value for F test is less than .05 (p<.05); the model is considered having significant explanatory power.

Coefficient Table

Model	Unstd. Coefficient (B)	Std. Error	Std. Coefficient (Beta)	t	Sig.
(Constant)	0.982	0.176	—	5.58	0.000
Perceived Usefulness	0.654	0.036	0.701	18.22	0.000

Coefficient table for this model suggested that one-unit increase in perceived usefulness results in 0.654-unit in adoption of AI based FinTech services. Since the p value is less than 0.5 ($p<.05$) we accept H2: Perceived usefulness of AI-based FinTech services positively influences user adoption.

H3: Trust and security significantly influence user adoption of AI-based FinTech services.
Model Summary

Model	R	R^2	Adjusted R^2	SE
1	0.676	0.457	0.453	0.482

Model summary for hypothesis 3 suggests that 45% variance is explained by this model.

ANOAVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	67.912	1	67.912	292.54	0.000
Residual	80.688	318	0.254		
Total	148.600	319			

Since the observed value of F test is less than critical value and ($p<.05$) the model has significant.

Coefficient Table

Model	Unstd Coefficient (B)	Std. Error	Std. Coefficient (Beta)	t	Sig.
(Constant)	1.035	0.182	—	5.69	0.000
Trust & Security	0.621	0.036	0.676	17.10	0.000

Coefficient table shows that Trust and security when increases by one unit, adoption increases by 0.621 unit, and since ($p<.05$) we accept Thus H3: Trust and security significantly influence user adoption of AI-based FinTech services is accepted.

DISCUSSION AND CONCLUSION

All hypotheses of the study are supported by the analysis. Organizations should work on enhancing usefulness of AI based FinTech services. It will further increase the adoption of digital platforms. Trust and Security is very important aspects in users' perspective. If organizations increase this perception it will lead to enhanced adoption rate among non-users. It is recommended that to improve digital financial inclusion institutions should emphasise on improving AI-based FinTech services. It will lead to enhanced digital inclusion. Eventually it will result in greater access to millions of new users and thus population which not touched by banks may come into financial system. Despite following scientific techniques in this study, it is not free of its limitations. First limitation is sampling technique. Non probability sampling technique is used, which is not free from biases. Future study may overcome this limitation by working on specific population framework. Second limitation is that the study is conducted in urban area only. Hence it limits its generalizability to rural or semi urban areas. Future study may expand the scope of the study.

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