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(REVIEW ARTICLE)

The role of artificial intelligence in enhancing financial inclusion: A review of its impact on financial services for the unbanked population in the United States

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Abstract

Financial inclusion, the strategy for assuring availability of accessible, affordable and reliable financial services, is critical for reducing poverty and fostering economic development globally. Despite progress, billions of people worldwide remain excluded from formal financial systems. Artificial Intelligence (AI) presents a transformative opportunity to bridge these exclusion gaps by offering innovative solutions that enhance the availability, affordability and the usability of financial services.

Based on the existing research and literature review, the study examines the potential advantages, challenges, and ethical considerations associated with AI-driven financial services. This research also offers an overview of AI applications in financial services, exploring how advanced data driven methodologies such as machine learning, natural language processing, and predictive analytics are transforming the field of financial inclusion. The findings underscore AI's role in broadening access to financial services, improving financial literacy, and fostering inclusive economic growth.

This research contributes to both theoretical understanding and practical applications, offering insights for policymakers, financial institutions, and fintech innovators to understand and advance inclusive financial systems globally.

Keywords: Financial inclusion; Underbanked; Underserved; Artificial Intelligence; Financial services; Minority groups; Socio-economic impact; Regulatory frameworks; Ethical considerations; Sustainable development.

1. Introduction

The study explores the global challenge of financial inclusion, defined by the World Bank as access to affordable and suitable financial products and services.

Traditional systems have struggled to reach underserved populations due to barriers like geographical remoteness and high transaction costs, perpetuating socio-economic inequalities. Artificial Intelligence in financial services represents a transformative shift, offering capabilities such as machine learning and natural language processing. These technologies enable personalized services, process automation, and innovative product development, potentially lowering costs and enhancing regulatory compliance. Despite AI's potential, global financial exclusion remains

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significant, with 1.7 billion adults unbanked worldwide. Issues of affordability, usability, and relevance of financial services persist for marginalized groups like women, rural populations, and small-scale entrepreneurs.

The study address questions on how AI can expand financial inclusion globally, its socio-economic impacts, and the influence of regulatory frameworks and ethics. It emphasizes the theoretical contribution to understanding the practical implications of AI's role for policy, financial systems, financial institutions, and fintech innovators across developed and developing economies.

AI-driven financial services can empower marginalized communities and promote inclusive economic development by overcoming systemic barriers. However, challenges include data privacy concerns, regulatory complexities, and the digital divide.

The study's scope includes various AI technologies and their implications, with limitations in data availability and biases in AI datasets noted.

2. Review of Relevant Literature

Research on artificial intelligence (AI) and financial inclusion should utilize AI and machine learning (ML) tools for data analysis and forecasting. As noted by [1], "fuzzy logic and other ML techniques must be used to interpret data or market conditions". Policymakers should ensure that AI initiatives for enhancing financial inclusion are tailored to specific objectives. It is crucial to account for factors such as human behavior, financial infrastructure, and government policies before deploying AI for financial services. Addressing the barriers to financial inclusion through technology is essential, as it not only helps in overcoming these obstacles but also ensures that technology fulfills its intended purpose.

[1] highlight that "financial inclusion is a significant indicator of accomplishing targets for human development". They point out that financial inclusion is vital for fostering economic growth by enhancing business activities and improving the circulation of funds. However, traditional financial systems face numerous barriers that impede financial inclusion. The authors argue that "with the evolution of Industry 4.0, applications of AI have facilitated the process of financial inclusion to a great extent". AI tools are deemed crucial for overcoming these barriers, as they provide capabilities beyond the limited processing and analysis abilities of traditional methods.

[3] emphasizes the need for continuous innovation in financial technology, asserting that "future fintech advancements should prioritize ethical considerations and a commitment to inclusivity". The study argues that responsible use of big data is crucial for harnessing its full potential to advance financial inclusion. Mhlanga notes that "this study lays a foundation for subsequent empirical studies to explore the nuanced interplay between big data and financial inclusion", aiming to foster a more inclusive and equitable financial ecosystem.

The research focused on examining how artificial intelligence (AI) affects digital financial inclusion. This concept is increasingly important in discussions about how to engage financially active individuals at the lower end of the economic spectrum. Fintech companies are leveraging AI to promote digital financial inclusion, aiming to integrate low-income groups, women, youth, and small businesses into the mainstream financial system.

The study found that AI significantly impacts digital financial inclusion by enhancing risk detection, measurement, and management, reducing information asymmetry, providing customer support through chatbots, and improving fraud detection and cybersecurity. In terms of risk management, AI is revolutionizing financial inclusion by utilizing algorithms to automate these processes, allowing vulnerable groups—such as women, youth, and smallholder farmers—who were previously excluded from traditional banking due to risk concerns, to access financial services.

Moreover, AI addresses information asymmetry by enabling access to various online platforms and social networks that generate extensive personal data. This helps bridge the gap between financial institutions and individuals, thereby enhancing financial inclusion. While there are concerns regarding AI's role in the evolving industry, it is crucial to recognize its significant contributions to digital financial inclusion.

Consequently, the study recommends that both financial and non-financial institutions embrace and expand their use of AI, as it offers considerable advantages in facilitating access to the formal financial market for those who have been historically marginalized.

According to the [4], the rise of artificial general intelligence (AGI) in Latin America is significantly transforming the financial sector. The article highlights that with over 600 venture-backed fintech companies in the region, there is a

marked shift from traditional banking towards innovative AGI applications. This shift is not only increasing the number of bank accounts but also fostering a broader movement towards financial education and empowerment. The piece asserts that "these advancements represent a new era of financial empowerment and innovation"

[5] highlights the crucial role of artificial intelligence (AI) in advancing financial inclusion and its potential to reduce poverty and stimulate global economic growth. The article points out that "an unbiased system is required for financial inclusion, which can be achieved by utilizing Artificial Intelligence". AI's influence in banking is significant, with its market value projected to exceed $130 billion by 2027. The article outlines various applications of AI in the financial sector, including "detecting fraudulent transactions, customer management, enhancing privacy and security, [and] understanding documents". This transformation underscores AI's potential to revolutionize the banking industry and broaden access to financial services.

[6] leveraging technology to digitize financial services can enhance financial inclusion by improving operational efficiency. The article explains that operational efficiency is crucial for developing a viable business model to serve financially excluded populations. It notes, "Achieving operational efficiency is a precondition for an economically viable business model for engaging with the excluded". The article emphasizes that capturing a portion of the low per capita daily-spending capacity of these consumers is essential for covering service costs and ensuring the sustainability of financial institutions.

[7] highlight the complexity of addressing financial exclusion for people with disabilities, asserting that "addressing the multiple dimensions of financial exclusion of people with disability requires a comprehensive, multifaceted approach, integrating attitudinal change, ICT accessibility, and a commitment to disability justice". They emphasize the importance of collaborative efforts from banks, policymakers, and global stakeholders such as the Asian Development Bank and GDI Hub to effectively improve financial inclusion for individuals with disabilities.

[8] discusses the potential of artificial intelligence (AI) to enhance financial inclusion, particularly for vulnerable populations. He notes that "advances in technology would definitely assist the vulnerable sections of society" but emphasizes that "the policymakers should evaluate the advances in AI and ML prior to implementing these technologies" (p.3) Gohil advocates for regulating AI and ML to protect these populations, promoting open banking, and investing in digital infrastructure. He also recommends conducting a cost-benefit analysis to ensure that AI and ML technologies contribute positively to the economy by extending financial services to unbanked groups, thereby supporting overall development.

[9] explores the potential effects of generative AI on wealth disparities among Black communities. The article highlights a significant concern: Black Americans currently capture only about 38 cents of every dollar of new household wealth, despite making up 13 percent of the U.S. population. The report warns that if this trend persists and the projected growth of Black households materializes, "by 2045, racially disparate distribution of new wealth created by generative AI could increase the wealth gap between Black and White households by $43 billion annually. This projection underscores the need for targeted policies to address the potential exacerbation of existing wealth disparities.

[10] discusses the evolving regulatory landscape in response to fintech innovations. They highlight that "regulatory and supervisory policy tools will have to adapt" to address the challenges posed by emerging financial service providers, which may not be adequately covered by existing regulations. The authors emphasize the difficulty in balancing "competition and stability" within the restructured financial services sector and note that "rules for control over data" must be established to ensure privacy, enhance financial inclusion, and prevent new forms of discrimination and bias. They also reference the "distributional effect of machine learning in US mortgages" and the fintech gender gap, illustrating how technology impacts different racial groups differently in terms of credit scoring.

3. Data Collection Methods and Data Analysis Techniques

This study utilizes a mixed-methods design, merging quantitative and qualitative research to investigate how AI contributes to improving financial inclusion for those without access to traditional banking services. The quantitative component delivers concrete data on financial inclusion rates and the usage of AI-powered financial tools, providing statistical backing for the effectiveness of these technologies.

4. A mixed method approach is used to facilitate a comprehensive exploration of the research problem.

Quantitative data offers quantifiable results and statistical insights into financial inclusion rates and the adoption of AI-driven financial services, while qualitative data offers quantifiable results, enabling an understanding of the experiences, challenges, and advantages associated with AI initiatives. Combining these methods enriches the analysis and ensures a robust examination of AI's impact on financial inclusion.

The data collection for this study relies exclusively on secondary sources. The rationale for using secondary data is two-fold: (a) the availability of comprehensive datasets and reports from reputable organizations, and (b) **The ability to conduct a comprehensive analysis without the time-consuming and resource-intensive process of primary data gathering.**

These sources include:

- Industry Reports: Reports from organizations such as the World Bank provide valuable insights into global and national trends in financial inclusion and the deployment of AI technologies in financial services. Also includes data from the Federal Deposit Insurance Corporation (FDIC) **[11]** which offers detailed information on the state of financial inclusion in the United States, including demographic disparities and barriers to banking access.
- Academic Journals and Publications: Peer-reviewed journals and academic publications covering topics such as AI, financial inclusion, mobile banking, and credit scoring offer empirical evidence and theoretical frameworks that underpin the analysis.
- Online Databases and Archives: Data from financial institutions, technology companies, and relevant governmental agencies provide up-to-date information on AI-driven financial inclusion initiatives and their outcomes.

Given the reliance on secondary data, the research instruments include document analysis of industry reports, academic journals, and financial data from online databases, as well as content analysis, a qualitative method used to identify patterns, themes, and trends in the textual data from these documents related to AI-driven financial inclusion. The validity of the research instruments is ensured by the credibility of the data sources, reports from reputable organizations and peer-reviewed journals which are reliable and valid. Reliability is further enhanced through the triangulation of the data sources by cross-verifying information from multiple documents to ensure consistency and accuracy.

The data analysis employs both qualitative and quantitative approaches to interpret the gathered information. These analysis techniques were chosen to provide a detailed and nuanced understanding of the role of AI in financial inclusion, capturing both the numerical trends and the qualitative insights.

- Quantitative Analysis: Data on financial inclusion rates, mobile banking adoption, and credit scoring outcomes are analyzed using statistical methods to identify trends, correlations, and patterns. This involves utilizing descriptive statistics to summarize the data and inferential statistics to generalize about the unbanked population.
- Qualitative Analysis: Content analysis is utilized to identify and assess themes within qualitative data. This process involves coding the data, organizing the codes into themes, and interpreting the results to understand the key benefits, challenges, and best practices related to AI-driven financial inclusion initiatives.

Furthermore, given the nature of secondary data research, several ethical considerations are considered to ensure compliance with ethical standards. All secondary data sources used are publicly available and do not contain personal or confidential information. The study adheres to data privacy regulations and guidelines, ensuring that no sensitive information is disclosed or misused.

Proper attribution is given to all data sources and references used in the study, respecting intellectual property rights and avoiding plagiarism. This ensures the academic integrity of the research. Efforts are made to maintain objectivity and minimize bias in data analysis. This includes cross-referencing data from multiple sources.

Finally, the research process is documented transparently, with clear explanations of the methodologies and analytical techniques used. This enhances the credibility and replicability of the study.

5. Discussion of Results and Findings

We analyzed Data from the FDIC on the impact on financial services across four relevant demographics (Race/Ethnicity, Education Level, Disability and Household/Family income).

5.1. Unbanked Households by Race/Ethnicity (2021)

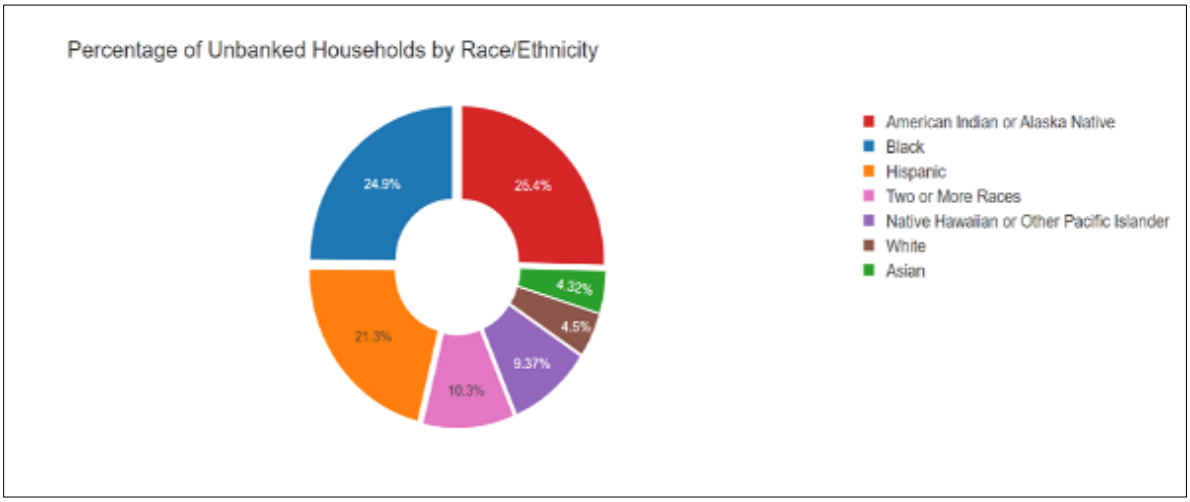

Figure 1 Percentage of Unbanked Households by Race/Ethnicity (2021)

The data shows significant disparities in banking access across different racial and ethnic groups. American Indian or Alaska Native, and Black households exhibit the highest percentages of unbanked individuals. Hispanic households also show a high percentage of unbanked individuals. Conversely, White households have the lowest percentage of unbanked individuals.

5.2. Unbanked Households by Education Level (2021)

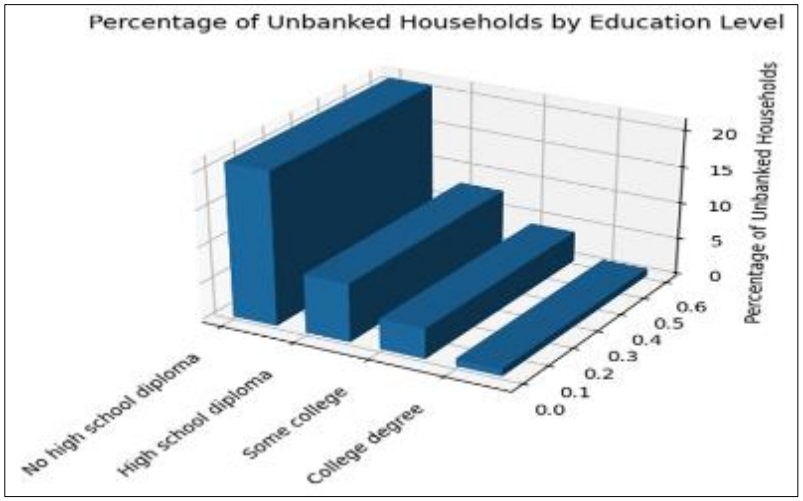

Figure 2 Percentage of Unbanked Households by Education Level (2021)

The findings reveal an inverse relationship between education level and the percentage of unbanked households. As the level of education increases, the percentage of unbanked households decreases significantly. Households where the highest level of education is "No high school diploma" show the highest percentage of unbanked status, while those with a college degree have the lowest percentage.

5.3. Unbanked Households by Disability (2021)

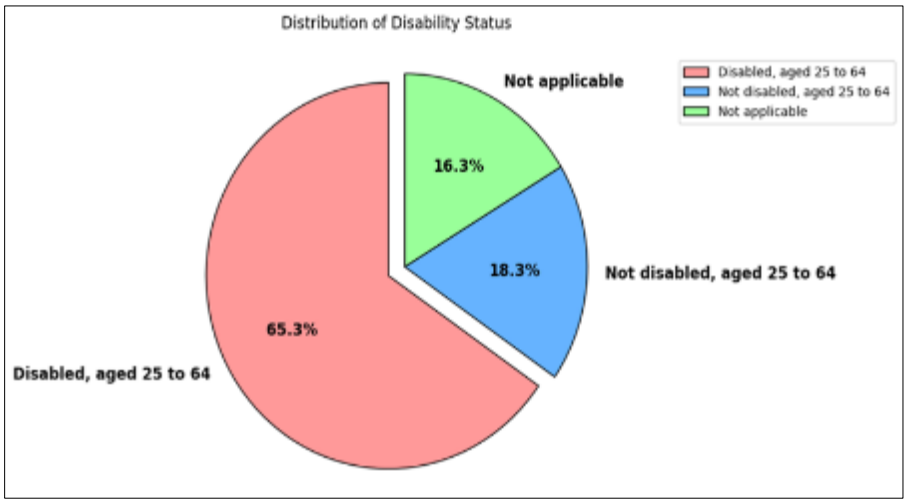

Figure 3 Percentage of Unbanked Households by Disability (2021)

The data shows that approximately 18% of households headed by a non-disabled individual are unbanked, compared to 65% of households with a disabled member. This disparity can be attributed to several factors, including higher living costs, irregular income patterns, and barriers to accessing traditional banking services. Disabled individuals often face higher living costs due to medical expenses and other disability-related needs. These financial burdens can lead to economic instability, making it difficult for them to maintain traditional banking relationships. Additionally, many disabled individuals rely on government advantages, which may be viewed as less stable by AI-driven credit scoring models, thereby affecting their perceived creditworthiness. These models, which typically prioritize regular income from employment, may not adequately capture the financial reality of disabled individuals, leading to their exclusion from financial services. Finally, beyond the opportunities provided by digital banking services, physical accessibility to some components of banking services still remains a significant barrier.

5.4. Unbanked Households by Family Income (2021)

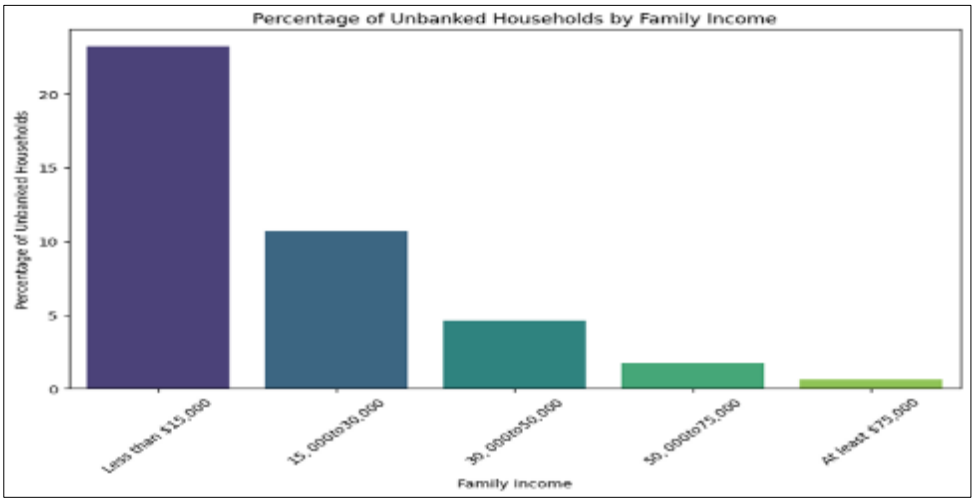

Figure 4 Percentage of Unbanked Households by Family Income (2021)

This data shows a significant disparity between individuals with and without family income. Households without significant family income are more likely to be unbanked, with 27% falling into this category, compared to 5% of households with family income. This highlights the challenges faced by individuals without steady family income in accessing traditional banking services.

Traditional financial systems and AI algorithms often rely on steady income as a key indicator of creditworthiness. Individuals without family income, often engaged in irregular or informal employment, are not adequately captured by

these systems and are excluded from financial services [12]. This exclusion perpetuates a cycle of financial instability and marginalization, entrenching their unbanked or underbanked status.

Research by [13] suggests that incorporating alternative data sources, such as utility and rental payment histories, could help AI systems better assess the creditworthiness of individuals without family income. However, the adoption of such practices remains limited, and many in this demographic continue to face barriers to accessing essential financial services.

6. Analysis and Interpretation of Results

The data reveals stark disparities in banking access across racial, ethnic, and socioeconomic groups in the US. American Indian or Alaska Native, and Black households exhibit the highest rates of unbanked individuals, at 25.4% and 24.9% respectively, while White and Asian households have the lowest rates, at 4.5% and 4.32% respectively. These disparities are influenced by systemic barriers such as geographical limitations in rural and underserved urban areas, limited digital literacy, and discriminatory lending practices.

The research investigated the influence of artificial intelligence (AI) on digital financial inclusion, a topic that is gaining importance in efforts to engage financially active individuals at the lower end of the economic spectrum. Fintech companies are utilizing AI to enhance digital financial inclusion, with the goal of incorporating low-income populations, women, youth, and small businesses into the mainstream financial landscape.

The findings reveal that AI plays a crucial role in advancing digital financial inclusion by improving risk detection, measurement and management, decreasing information asymmetry, offering customer support via chatbots, and bolstering fraud detection and cybersecurity. In the realm of risk management, AI is transforming financial inclusion through the automation of these processes, enabling vulnerable groups—such as women, youth, and smallholder farmers—who have been historically excluded from traditional banking due to risk factors, to gain access to financial services.

Additionally, AI mitigates information asymmetry by facilitating access to various online platforms and social networks that generate rich personal data. This access helps close the gap between financial institutions and individuals, thereby promoting greater financial inclusion. Despite some concerns about AI's role in the evolving industry, it is essential to acknowledge its substantial contributions to digital financial inclusion.

As a result, the study advocates for both financial and non-financial institutions to adopt and enhance their use of AI, as it provides significant benefits in improving access to the formal financial market for those who have been traditionally marginalized. [14].

These groups are often excluded from traditional banking services due to inherent biases in AI algorithms that prioritize stable income sources.

Overall, addressing these disparities requires addressing systemic barriers, improving financial literacy, and ensuring that AI technologies used in financial services are inclusive and unbiased.

7. Barriers to Financial Inclusion

High unbanked rates among American Indian or Alaska Native, Black, and Hispanic households highlight significant barriers to financial inclusion. Key determinants include race/ethnicity, education level, financial literacy, disability status, and family income. These groups face geographical limitations, discriminatory lending practices, and a lack of trust in mainstream financial systems [15].

Geographical limitations in rural or underserved urban areas restrict access to banking infrastructure, compounded by the digital divide with lower internet penetration and limited digital literacy. Systemic biases in banking practices and credit scoring models favoring white, employed, and educated groups also disproportionately affect minorities.

Higher education levels are associated with greater banking access and utilization, with households without high school diplomas showing the highest unbanked rates. Traditional credit models undervalue non-traditional income sources and fail to consider higher living costs associated with disability, limiting access to financial services.

Income level significantly impacts banking access, with 27% of households without family income being unbanked compared to 5% with family income. Traditional credit models and AI algorithms often exclude individuals without steady, formal income, perpetuating economic instability**.** Incorporating alternative data sources, like utility and rental histories, could improve access, but adoption remains limited.

8. Potential Impact of AI on Financial Products and Services

AI integration in financial services holds potential to enhance financial inclusion by addressing traditional barriers. AI-driven alternative credit scoring, using data points like utility payments and social media activity, expands access to credit for the underserved [16].

AI contributes to socioeconomic stability by empowering individuals, particularly women and disabled persons, enhancing financial autonomy and decision-making. Increased financial participation fosters economic growth by expanding savings and investment bases [17]. However, equitable AI applications require addressing biases in algorithms and ensuring fair deployment through transparent design, audits, and robust regulatory frameworks [18].

Persistent disparities in banking access among minorities due to geographical limitations, discriminatory practices, and educational barriers necessitate targeted financial education initiatives [19]. While AI offers promising solutions, mitigating biases and addressing multifaceted barriers are crucial for promoting equitable access to financial services.

9. Conclusion

Integrating AI into financial services promises innovative solutions to enhance financial inclusion for underserved communities. However, it remains evidently essential to address inherent biases within AI algorithms to prevent perpetuating existing disparities. Financial regulators must devise robust strategies to detect, mitigate, and monitor biases to ensure fairness.

A holistic approach integrating technological advancements with targeted interventions, educational initiatives, and inclusive policies is needed for comprehensive financial inclusion. Collaborative efforts among stakeholders can create supportive ecosystems for equitable access to AI-driven financial services [20].

Developing inclusive AI systems involves utilizing diverse datasets and engaging in participatory design processes. Enhancing digital literacy through educational programs empowers underserved populations to confidently use AI-based financial tools. Effective regulatory frameworks are essential to guide ethical AI deployment, ensuring data privacy, algorithmic transparency, and bias mitigation.

Financial institutions should focus on developing targeted financial products for underserved populations, ensuring accessibility, affordability, and suitability. Continuous monitoring and evaluation of AI-driven financial services are crucial to maintaining their effectiveness and equity over time.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Fazal, A., Ahmed, A., Abbas, S., & Rasool, A. (2022). How artificial intelligence is promoting financial inclusion? A study on barriers of financial inclusion. In Proceedings of the 2022 International Conference on Business Analytics for Technology and Security (ICBATS). https://doi.org/10.1109/ICBATS54253.2022.9759038

[2] Fazal, A., Ahmed, A., & Nisar, S. (2023). Artificial Intelligence and Financial Inclusion: A Systematic Literature Review. Journal of Asian Development Studies Vol. 12, Issue 3. https://www.researchgate.net/profile/Anam-Fazal3/publication/374197643_Artificial_Intelligence_and_Financial_Inclusion_A_Systematic_Literature_Review/links/6513b04fcce2460b6c36d1fe/

[3] Mhlanga, D. (2024). The role of big data in financial technology toward financial inclusion. Frontiers in Big Data, 7, 1184444. https://doi.org/10.3389/fdata.2024.1184444

[4] World Economic Forum. (2024, January 11). How Artificial General Intelligence will drive an inclusive financial sector in Latin America. https://www.weforum.org/agenda/2024/01/ai-is-driving-the-evolution-of-a-more-inclusive-financial-sector-in-latin-america-here-is-how/

[5] Ydata. (2022, November 23). The impact of artificial intelligence on financial inclusion. https://ydata.ai/resources/the-impact-of-artificial-intelligence-on-financial-inclusion

[6] International Banker. (2024, June 17). Digitize financial services to improve financial inclusion. https://internationalbanker.com/finance/digitize-financial-services-to-improve-financial-inclusion/

[7] Puli, L., Layton, N., Bell, D., & Shahriar, A. Z. (2024). Financial inclusion for people with a disability: A scoping review. Global Health Action, 17, 2342634. https://doi.org/10.1080/16549716.2024.2342634

[8] Gohil, A. (2024). Leveraging artificial intelligence for financial inclusion: Benefits, challenges, and the path forward. Journal of Emerging Technologies and Innovative Research (JETIR), 11(7). https://www.jetir.org/papers/JETIR2407187

[9] McKinsey Institute of Black Economic Mobility. (2023, December 19). The impact of generative AI on Black communities. https://www.mckinsey.com/bem/our-insights/the-impact-of-generative-ai-on-black-communities

[10] Feyen, E., Frost, J., Gambacorta, L., Natarajan, H., & Saal, M. (2021). Fintech and the digital transformation of financial services: Implications for market structure and public policy (BIS Papers No. 117). Bank for International Settlements. https://www.bis.org/publ/bppdf/bispap117.pdf

[11] FDIC (2021). FDIC National Survey of Unbanked and Underbanked Households - Executive Summary. https://www.fdic.gov/system/files/2024-07/2021execsum.pdf.

[12] Morgan, P. J., & Trinh, L. Q. (2023). Determinants and impacts of financial literacy in developing countries. Journal of Banking & Finance, 37 (7), 2763-2772.

[13] Mader, P., & Jackson, T. (2023). Financial inclusion for the masses? Innovations in digital finance for emerging markets. Development Policy Review, 36 (S1), O73-O94.

[14] Kim, J., & Kang, S. (2023). Education and financial inclusion: A study on the role of education in promoting financial access. Journal of Financial Services Research.

[15] KPMG. (2020). The future of fintech: Perspectives and opportunities. KPMG International. https://kpmg.com/xx/en/home/insights/2023/09/the-future-of-fintech.html

[16] Lal, R., & Sachdev, I. (2023). Artificial intelligence and financial inclusion: The next big thing. Journal of Financial Regulation and Compliance, 27 (2), 304-319.

[17] Ritika Tyagi (2023). Empowering the Unbanked: A revolution in Financial Inclusion through Artificial Intelligence. International Journal of Research in Engineering, Science and Management Volume 6, Issue 10, October 2023 https://www.ijresm.com | ISSN (Online): 2581-5792

[18] Alvarez Ruiz, L. (2023). Empowering women through digital financial inclusion: Comparative study before and after COVID-19. Sustainability. https://www.mdpi.com/2071-1050/15/12/9154

[19] Rana.S., & O.E. (2020). AI and Financial inclusion: An overview. Journal of Fintech. 1(1).8

[20] Frost, J., Gambacorta, L., Huang, Y., Shin, H. S., & Zbinden, P. (2023). BigTech and the changing structure of financial intermediation. Economic Policy. https://academic.oup.com/economicpolicy/article/34/99/451/5567321

[21] World Bank Group. (2019). Financial inclusion and the role of digital financial services. World Bank Group Policy Research Working Paper No. 8900. https://pubdocs.worldbank.org/en/230281588169110691/Digital-Financial-Services.pdf