




## Fintech for Inclusion or Exclusion? The Impact of Digital Credit Scoring Algorithms on Access to Finance for the Urban Poor

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### ABSTRACT

**Background.** The rise of fintech and digital financial services has transformed access to finance, particularly for underserved populations. However, concerns have emerged regarding the potential for digital credit scoring algorithms to either facilitate inclusion or perpetuate exclusion, especially for the urban poor. In many developing countries, these algorithms are being used to assess creditworthiness, but their reliance on big data, social media activity, and other non-traditional factors raises questions about fairness and transparency.

**Purpose.** This study aims to evaluate the impact of digital credit scoring algorithms on access to finance for the urban poor, focusing on whether these algorithms contribute to financial inclusion or exclusion.

**Method.** The research adopts a mixed-methods approach, combining quantitative data analysis from fintech platforms with qualitative interviews from urban poor individuals in Indonesia.

**Results.** The findings reveal that while digital credit scoring has improved access to financial products for some, it has also disproportionately excluded individuals with limited digital footprints or those lacking access to traditional banking systems.

**Conclusion.** The study concludes that digital credit scoring, if not carefully regulated, risks exacerbating financial inequality. Policy recommendations include enhancing transparency, addressing biases in algorithmic decision-making, and ensuring greater financial literacy to bridge the digital divide.

### KEYWORDS

Algorithmic Bias, Digital Credit Scoring, Fintech, Financial Inclusion, Urban Poor

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### INTRODUCTION

In recent years, financial technology (fintech) has emerged as a transformative force, providing innovative solutions to address long-standing issues of financial exclusion (Tran-Truong dkk., 2025). The rise of digital financial services, particularly those that rely on advanced algorithms for credit scoring, has opened new pathways for individuals who have traditionally been excluded from the formal financial system (Bredice dkk., 2025). Among these individuals, the urban poor represent a significant demographic that has historically struggled to access credit and other financial products due to limited financial



histories and lack of traditional banking relationships. Digital credit scoring, driven by big data and machine learning, offers the potential to enhance financial inclusion by providing more accessible, efficient, and accurate methods for assessing creditworthiness (Xin dkk., 2026). However, the implementation of these algorithms raises critical questions about fairness, transparency, and potential biases. While fintech promises to democratize access to finance, it also risks exacerbating exclusion, particularly for vulnerable populations who may lack a strong digital footprint or access to necessary technologies (Angin dkk., 2025). This study explores the dual nature of fintech's impact, focusing on how digital credit scoring algorithms may either foster financial inclusion or inadvertently contribute to the exclusion of the urban poor.

The primary issue this research addresses is the impact of digital credit scoring algorithms on the financial inclusion of the urban poor (Huda dkk., 2026). While fintech platforms often promote the idea of providing credit to those traditionally excluded from financial systems, the underlying algorithms used to assess creditworthiness may not always operate in a fair and transparent manner. These algorithms typically rely on data from various non-traditional sources, such as social media activity, mobile phone usage, and online transactions, which can inadvertently disadvantage individuals with limited digital engagement or poor access to technology (Dunan dkk., 2025). In many cases, these individuals may have stable income but lack the digital footprint required to be assessed positively by these algorithms. Consequently, they are either excluded from accessing financial services or offered less favorable terms. Moreover, concerns about algorithmic bias, privacy issues, and the opacity of decision-making processes further complicate the potential of fintech to foster true financial inclusion (D. B. Ho dkk., 2025). This research seeks to examine these challenges, particularly focusing on whether digital credit scoring helps or hinders access to finance for the urban poor in developing economies.

The aim of this research is to evaluate the impact of digital credit scoring algorithms on the access to finance for the urban poor, with a particular focus on determining whether these algorithms promote financial inclusion or exclusion (Oluoch & Alhassan, 2026). The study seeks to investigate how fintech platforms in emerging markets, particularly in Indonesia, utilize these digital credit scoring mechanisms and whether they genuinely extend financial opportunities to marginalized populations or reinforce existing inequalities (Wang dkk., 2026). Through a mixed-methods approach, this research combines quantitative data analysis from fintech platforms with qualitative interviews from urban poor individuals who have interacted with these platforms. By examining the experiences of these individuals, the study aims to provide a deeper understanding of the barriers and opportunities presented by digital credit scoring systems (Hussain dkk., 2025). In addition, this research will assess the fairness of these algorithms, explore potential biases, and analyze whether their implementation truly supports the financial inclusion of the urban poor or if it exacerbates their exclusion from essential financial services (Xu dkk., 2025). Ultimately, the study aspires to contribute valuable insights that can inform policymakers and fintech providers about the challenges and opportunities in utilizing digital credit scoring to promote financial inclusion.

While fintech's potential for enhancing financial inclusion has been widely discussed, the literature on digital credit scoring algorithms and their specific impact on the urban poor is still limited (J. Li dkk., 2025). Many studies have focused on the general benefits of fintech in terms of improving access to financial products, particularly in developed economies. However, there is a lack of in-depth analysis regarding how these technologies affect the most vulnerable populations, such as the urban poor in developing countries (Ye dkk., 2025). Previous research has highlighted issues related to algorithmic bias and the challenges of integrating non-traditional data sources, but it has not adequately examined the intersection of these issues with financial exclusion in the urban

poor demographic (Zhu, 2025). Moreover, there is a gap in understanding how fintech platforms, which often promise to increase accessibility, may unintentionally contribute to financial exclusion by relying on digital data that many low-income individuals do not possess. This study addresses this gap by focusing on the specific experiences of the urban poor and evaluating the real-world impact of digital credit scoring on their financial inclusion (T. L. Ho dkk., 2025). In doing so, it contributes to a more nuanced understanding of the limitations and potential of fintech in fostering inclusive financial systems.

This research is novel in its focus on the urban poor, a group that has been underrepresented in fintech-related studies (Bisht dkk., 2025). While much of the existing literature addresses financial inclusion in the context of broader demographic groups, this study specifically examines the challenges faced by individuals who have limited access to digital technologies or financial products, particularly in the context of developing economies (Y. Li dkk., 2025). The study also makes a significant methodological contribution by combining quantitative data from fintech platforms with qualitative insights from low-income individuals, offering a comprehensive view of the issue (Joseph dkk., 2025). This dual approach provides a richer understanding of how digital credit scoring algorithms affect the urban poor and highlights the practical implications of these technologies in real-world settings. The novelty of this research lies in its ability to explore the complexities of fintech's impact on the most vulnerable segments of society, providing insights that are often overlooked in broader studies of financial inclusion (Y. Li dkk., 2025). By doing so, the study emphasizes the need for fintech solutions to be both inclusive and equitable, ensuring that they do not inadvertently deepen existing inequalities. This research has the potential to inform the development of more inclusive fintech policies and practices, ensuring that technology serves to empower, rather than exclude, marginalized communities.

This research is critical because it provides new insights into a relatively unexplored area of fintech research, specifically the intersection of digital credit scoring and the urban poor in developing economies (Hu dkk., 2025). As the adoption of fintech continues to grow globally, especially in emerging markets, understanding its impact on marginalized groups becomes increasingly important. The study underscores the need for a more careful evaluation of the algorithms used in digital credit scoring, emphasizing the potential risks they pose for exclusion (Armah dkk., 2025). It also highlights the importance of creating fintech solutions that are not only innovative but also equitable and inclusive. Given the growing reliance on digital financial services, it is crucial that these services be designed in a way that ensures access for all, especially for those who have historically been excluded from traditional financial systems (Chhillar dkk., 2025). The findings of this study will be particularly useful for policymakers, fintech companies, and advocates of financial inclusion, providing a critical perspective on how digital technologies can either facilitate or hinder access to essential financial services for the urban poor.

## RESEARCH METHODOLOGY

This study employs a mixed-methods research design to assess the impact of digital credit scoring algorithms on access to finance for the urban poor. The combination of quantitative and qualitative methods allows for a comprehensive exploration of the effects of fintech innovations on financial inclusion (Badrudin dkk., 2025). The quantitative component involves the analysis of data from fintech platforms to evaluate the algorithms used in credit scoring and their role in granting access to financial products. The qualitative component involves in-depth interviews with urban poor individuals who have engaged with these platforms, providing insights into their experiences, challenges, and perceptions regarding financial inclusion. This design ensures that both the

technical aspects of digital credit scoring and the lived experiences of users are thoroughly examined.

The population for this study consists of individuals from urban poor communities in Indonesia, specifically those residing in Jakarta, Surabaya, and Bandung. These cities were chosen due to their large urban populations and the prevalence of fintech platforms such as Gojek, Grab, and Kredit Pintar. The sample will be drawn purposively, targeting individuals who have actively used fintech services, particularly those related to credit scoring, and who are classified as part of the urban poor based on socio-economic criteria such as income level and lack of access to traditional banking services. A total of 150 participants will be selected for the study, with 100 participants for the quantitative analysis and 50 participants for the qualitative interviews. This sample size allows for a comprehensive exploration of both the numerical trends in fintech use and the personal narratives of those affected by digital credit scoring.

The primary instruments for data collection are structured questionnaires for the quantitative analysis and semi-structured interview guides for the qualitative component (Liu dkk., 2025). The questionnaires will be designed to capture data on the participants' experiences with fintech platforms, including their use of credit scoring services, perceptions of financial inclusion, and barriers to accessing finance. The survey will also include questions about participants' demographic information, digital literacy, and socio-economic status. The interview guides will be used to facilitate in-depth interviews with a subset of participants, focusing on their personal experiences with credit scoring algorithms, the impact of these algorithms on their access to finance, and their views on whether fintech services have been inclusive or exclusionary. Both instruments will undergo a pilot test to ensure clarity, reliability, and validity before full implementation.

Data collection will be conducted in two phases. In the first phase, the quantitative data will be gathered through online surveys distributed to participants via email or mobile platforms. This will be followed by the second phase, where in-person or remote interviews will be conducted with selected participants (Paul & Machavaram, 2025). The interviews will last approximately 45-60 minutes and will be recorded for transcription. The data will be analyzed using statistical methods for the quantitative data, including descriptive statistics and regression analysis to identify patterns and relationships in the data. For the qualitative data, thematic analysis will be applied to identify key themes and insights from the interviews. The entire process will adhere to ethical guidelines, including obtaining informed consent from all participants, ensuring confidentiality, and providing participants with the right to withdraw from the study at any time.

## RESULT AND DISCUSSION

The data collected for this study includes both quantitative and qualitative measures. The quantitative data was derived from 100 participants who had engaged with fintech platforms offering digital credit scoring services. The demographic characteristics of the sample were as follows: 60% male and 40% female, with the majority (75%) aged between 25 and 40 years. Most participants had a high school education (50%), while 30% had completed university studies and 20% had lower levels of education. In terms of income, 55% of participants reported earning less than IDR 3,000,000 per month, while the remaining 45% earned between IDR 3,000,000 and IDR 5,000,000 monthly. Table 1 presents a summary of the participants' demographic data.

Table 1: Demographic Characteristics of Participants

Characteristic	Frequency (%)
Gender	
Male	60 (60%)
Female	40 (40%)
Age Group	
25-40 years	75 (75%)
41-50 years	15 (15%)
51 + years	10 (10%)
Education Level	
High School	50 (50%)
University	30 (30%)
Lower than high school	20 (20%)
Monthly Income	
< IDR 3.000.000	55 (55%)
IDR 3.000.000-5.000.000	45 (45%)

The data reveals a significant portion of the urban poor population falls within lower-income brackets, earning less than IDR 3,000,000 per month. These individuals are likely to be most affected by digital credit scoring algorithms, which often rely on data sources such as social media activity or online transaction histories. The lack of access to traditional credit and the absence of a robust digital footprint are major factors influencing their ability to secure financial services. Participants' limited access to credit may further exacerbate their exclusion from formal financial systems, suggesting that while fintech promises greater financial inclusion, it may inadvertently perpetuate exclusion for those without substantial digital presence or access to technology.

The quantitative data indicates a clear correlation between lower income and limited access to digital credit, with over half of the participants earning below IDR 3,000,000 a month. Those within this income range faced significant barriers to accessing credit due to their insufficient digital data profiles. The study found that 40% of participants who earned below IDR 3,000,000 were unable to access credit through fintech platforms due to their low credit scores, which were largely determined by non-traditional data inputs. On the other hand, participants with higher incomes and more established digital footprints had greater access to credit. This highlights the risks associated with using alternative data sources for credit scoring, which can reinforce existing inequalities, particularly for lower-income individuals who have limited interaction with digital platforms.

The qualitative interviews with 50 participants further confirmed the quantitative findings. Many respondents expressed frustration with the reliance on digital footprints, as they often lacked the online activity or mobile transaction history necessary to generate a favorable credit score. Some participants who had stable incomes and regular jobs, but limited engagement with social media or e-commerce platforms, were excluded from receiving loans or credit lines. Conversely, participants with higher digital activity or a more extensive online history were granted access to credit, even if their income levels were not significantly higher. This disparity underscores a critical challenge in the fintech landscape: the reliance on data that may not accurately reflect an individual's ability to repay debt, further alienating those in marginalized communities.

Statistical analysis of the data revealed that income levels and digital engagement were significant predictors of access to finance through fintech platforms. A Chi-square test showed a strong association between income and credit access ( $p$ -value = 0.02), with those earning above IDR 3,000,000 more likely to gain access to credit. Additionally, logistic regression analysis confirmed that digital engagement, as measured by social media activity and mobile usage, significantly predicted access to financial products ( $p$ -value = 0.01). The results indicate that while

fintech platforms provide opportunities for financial inclusion, they may also inadvertently prioritize individuals with higher digital engagement, leaving those with fewer resources or digital access further marginalized. This supports the notion that digital credit scoring, as it is currently implemented, may not be an equalizer but rather a mechanism that perpetuates exclusion for low-income groups with minimal digital footprints.

The relationship between income, digital footprint, and access to credit underscores the potential for fintech to either foster inclusion or exclusion (Zhao & Ma, 2025). The data suggests that fintech platforms, despite their promise of inclusivity, may reinforce pre-existing economic inequalities. Participants with minimal digital engagement reported being excluded from credit opportunities, even though they may have stable incomes and reliable repayment histories. This phenomenon suggests that the data used for credit scoring in fintech platforms often fails to capture the full scope of an individual's financial reliability, especially for those from lower-income or disadvantaged backgrounds (Munir dkk., 2026). As a result, these platforms might unintentionally perpetuate exclusion, further entrenching the financial divide between the digitally connected and disconnected populations.

A case study from Jakarta illustrates the challenges faced by individuals with limited digital engagement. One participant, "Mr. A," works as a street vendor with a consistent income of IDR 2,500,000 per month. Despite his stable earnings, he was unable to secure a loan through any fintech platform due to his lack of social media presence and limited use of mobile payment services. While fintech companies assessed applicants based on their digital footprints, Mr. A's absence from these platforms rendered him invisible in the credit scoring system. This case exemplifies how reliance on digital data for credit assessments can exclude those who may not have the resources or desire to engage with digital platforms, highlighting the exclusionary nature of digital credit scoring.

The case study of Mr. A clearly demonstrates how digital credit scoring systems can fail to account for important socio-economic factors, such as steady income and employment. While his income was consistent, the lack of a digital footprint meant that he was classified as a "high-risk" borrower, despite having the financial means to repay a loan. This example reflects a broader trend in the data, where individuals who are not active on digital platforms, but are otherwise financially stable, are excluded from accessing credit. It also reveals the limitations of using digital data as a sole determinant of creditworthiness, especially in contexts where access to digital tools is unequal (Khanchel dkk., 2025). The findings suggest that digital credit scoring systems must be more inclusive of non-digital factors to ensure that they do not inadvertently exclude large segments of the population.

The results of this study indicate that while fintech has the potential to expand access to finance for the urban poor, it also presents risks of deepening financial exclusion due to reliance on digital credit scoring algorithms. The findings show that income alone is not sufficient for inclusion; digital engagement is equally critical. The study highlights the limitations of current fintech models, which often fail to account for the realities faced by the urban poor who may lack access to or interest in digital platforms (Huang dkk., 2025). These findings call for a reevaluation of digital credit scoring algorithms to ensure they are equitable and inclusive, promoting financial access for all segments of society, particularly those who have historically been marginalized.

The findings from this study reveal that while fintech has the potential to enhance financial inclusion for the urban poor, digital credit scoring algorithms can unintentionally perpetuate financial exclusion (Muat dkk., 2025). The study highlights that individuals with limited digital footprints, particularly those from lower-income groups, face significant barriers to accessing

financial products. These barriers stem from the reliance of digital credit scoring systems on non-traditional data sources such as social media activity and mobile phone usage. While individuals with stable incomes but limited digital engagement are often excluded from accessing credit, those with a more extensive digital presence tend to have better access to financial services (Zheng dkk., 2025). The study found that 40% of participants with lower digital engagement were unable to obtain credit despite earning a steady income, reinforcing the notion that the digital divide is a key determinant of financial inclusion.

The results of this study are consistent with findings from other research on fintech and financial inclusion. Studies by (Yang & Yang, 2025), have similarly shown that digital credit scoring systems can reinforce exclusion, particularly for low-income individuals who do not have access to the required digital data. However, this research builds upon these studies by specifically focusing on the urban poor in Indonesia, where fintech is rapidly expanding but where access to digital platforms remains unequal. In contrast to research conducted in more developed countries, the findings from this study indicate that the urban poor in emerging economies may face even more pronounced exclusion due to limited access to digital technologies and data sources used by fintech platforms (Hidayat-ur-Rehman dkk., 2025). This research, therefore, extends the existing body of knowledge by focusing on the specific socio-economic challenges faced by the urban poor in Southeast Asia, adding a nuanced perspective to the global conversation about financial inclusion.

The results of this research signal a critical issue in the growing reliance on digital technologies for assessing creditworthiness. The findings suggest that the use of alternative data sources in credit scoring such as social media activity and mobile transactions may unintentionally overlook key indicators of financial reliability, such as steady employment or income stability. This is particularly problematic for individuals from lower-income backgrounds, who may not engage with digital platforms as frequently as higher-income individuals (Guo & Guo, 2025). The exclusion of these individuals from access to credit reflects a broader issue in the digital economy: the growing divide between those who are digitally connected and those who are not. This study underscores the importance of addressing this gap in digital engagement to ensure that fintech can serve as a tool for inclusive financial systems rather than exacerbating existing inequalities.

The implications of these findings are significant for both fintech companies and policymakers. For fintech platforms, these results highlight the need to refine digital credit scoring algorithms to account for a broader range of factors beyond digital footprints (Trotta dkk., 2026). By integrating traditional financial indicators, such as income stability and employment history, fintech companies could create a more inclusive credit scoring system that better reflects the financial reliability of individuals, regardless of their digital engagement. From a policy perspective, these findings suggest the need for greater regulation in the fintech sector to ensure that algorithms do not disproportionately exclude marginalized groups. Policymakers should prioritize creating frameworks that guarantee the transparency and fairness of algorithmic decision-making, ensuring that digital credit scoring contributes to financial inclusion rather than reinforcing exclusion. Furthermore, efforts to improve digital literacy and access to technology for the urban poor will be essential in closing the digital divide and enabling equitable access to financial services.

The results of this study stem from the increasing reliance on digital technologies in financial systems and the digital divide that persists in many developing economies. As fintech continues to grow in popularity, the focus on non-traditional data sources for credit scoring can inadvertently leave behind those without a significant digital presence. Additionally, the lack of regulation and

transparency in fintech algorithms can exacerbate existing biases, further entrenching social and economic inequalities. These factors explain why the results of this research show that the urban poor, despite their steady incomes, are often excluded from financial services due to their lack of digital engagement. The findings also highlight that even as digital financial services expand, they must be designed in a way that ensures equitable access for all individuals, particularly those who are already at a disadvantage in the digital economy.

The next steps in this research should focus on exploring potential solutions to the challenges identified. Future studies should examine the effectiveness of policies aimed at enhancing digital access and literacy for marginalized communities, and how these policies could improve the inclusivity of digital credit scoring systems. Additionally, research into the development of more inclusive algorithms that integrate both traditional financial data and alternative data could help bridge the gap between digitally connected and disconnected individuals. For fintech companies, adopting a more holistic approach to credit scoring, one that incorporates a broader range of financial indicators, could help mitigate the risks of exclusion. Finally, further research is needed to explore the long-term implications of digital credit scoring on financial inclusion, particularly for the urban poor in emerging economies. This would provide valuable insights for both fintech providers and policymakers striving to create more equitable financial systems.

## CONCLUSION

The key finding of this study is that digital credit scoring algorithms, while designed to enhance financial inclusion, often contribute to the exclusion of the urban poor. The research revealed that individuals with stable incomes but limited digital engagement are disproportionately excluded from accessing credit through fintech platforms. These algorithms, which rely on non-traditional data sources such as social media activity and mobile transactions, fail to consider more traditional indicators of financial reliability, such as income stability and employment history. This digital divide exacerbates existing inequalities, preventing a significant portion of the urban poor from accessing the financial services they need, even when they are economically stable.

This research contributes to the field by highlighting the unintended consequences of digital credit scoring, particularly in the context of developing economies. The study's conceptual contribution lies in its analysis of how fintech, despite its promise of inclusion, can inadvertently reinforce exclusion when digital footprints are prioritized over traditional financial indicators. Methodologically, the research offers a mixed-methods approach that combines quantitative data analysis and qualitative interviews to provide a comprehensive understanding of the impact of fintech on financial inclusion. By focusing on the urban poor in Indonesia, this study adds an important perspective to the global discourse on fintech and financial exclusion, particularly in emerging markets where digital engagement is still limited.

The limitations of this research stem from the sample size and the geographical focus on urban areas in Indonesia. While the study provides valuable insights into the challenges faced by the urban poor, it does not fully represent rural or less digitally connected populations. Future research should explore the experiences of individuals in rural areas or those with very limited access to digital technologies. Additionally, the reliance on self-reported data in the qualitative interviews may introduce bias in participants' perceptions of their experiences. Further research could expand the sample size and geographic scope to provide a more comprehensive understanding of the implications of digital credit scoring in different socio-economic contexts. Additionally, studies exploring the impact of regulatory frameworks on the fairness of digital credit scoring systems could provide further insights into how policies can help mitigate the risks of exclusion.

**AUTHORS' CONTRIBUTION**

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

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