

DOI: <https://doi.org/10.36719/2663-4619/126/89-93>

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AI-Based Credit Scoring for Financial Inclusion: Insights from South Korea

Abstract

This study investigates artificial intelligence (AI)-based credit scoring systems aimed at enhancing financial inclusion in the context of South Korea. It highlights how AI models, compared to traditional credit scoring methods, can more accurately assess individual credit risk and expand access to financial services. The study also examines issues related to AI technologies, including transparency, ethical principles, and data security. The findings indicate that, when properly implemented, AI-based credit scoring can promote financial inclusion, particularly for population groups with limited or no access to traditional banking services.

Keywords: *financial inclusion, credit risk assessment, South Korea, artificial intelligence, financial technology*

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Maliyyə daxilliyi üçün süni intellekt əsaslı kredit qiymətləndirməsi: Cənubi Koreyadan məlumatlar

Xülasə

Bu tədqiqat Cənubi Koreya kontekstində maliyyə inklüzivliyini artırmaq üçün süni intellekt (AI) əsasında kredit qiymətləndirmə sistemlərini araşdırır. Həmçinin, AI modellərinin ənənəvi kredit skora metodu ilə müqayisədə fərdlərin kredit riskini daha dəqiq qiymətləndirməsi və maliyyə xidmətlərinə çıxış imkanlarını genişləndirməsi qeyd olunur. Tədqiqat həmçinin AI texnologiyalarının şəffaflıq, etik prinsiplər və məlumat təhlükəsizliyi kimi məsələlərini qiymətləndirir. Nəticələr göstərir ki, düzgün tətbiq edildikdə AI-based kredit skora maliyyə inklüzivliyinin artırılmasına, xüsusilə də ənənəvi bank xidmətlərinə çıxışı olmayan və ya az çıxışı olan əhali qruplarına yardım edə bilər.

Açar sözlər: *maliyyə inklüzivliyi, kredit riskinin qiymətləndirilməsi, Cənubi Koreya, süni intellekt, maliyyə texnologiyaları*

Introduction

In recent years, financial inclusion has become a key priority for both developed and developing countries, as it ensures that individuals and businesses have access to useful and affordable financial products and services. Access to credit is a central component of financial inclusion, enabling individuals and small enterprises to invest, manage financial risks, and improve their economic well-being. However, traditional credit scoring methods, which rely mainly on historical financial data and standardized metrics, often exclude individuals with limited credit history or irregular income, thereby perpetuating financial inequality.

Artificial intelligence (AI) offers significant potential to transform credit scoring by analyzing large volumes of structured and unstructured data, detecting patterns, and generating predictive models that are more accurate and inclusive than conventional methods. In South Korea, a technologically advanced country with widespread digital infrastructure, AI-based credit scoring provides an opportunity to enhance financial inclusion by expanding access to loans and other financial services for underbanked and underserved populations (Gupta, 2022).

At the same time, implementing AI in credit scoring raises important ethical, regulatory, and technical challenges. Issues such as transparency, algorithmic fairness, data privacy, and security must be carefully addressed to ensure that AI-driven financial solutions do not reinforce biases or undermine user trust. This study explores the potential of AI-based credit scoring to improve financial inclusion in South Korea while highlighting the associated opportunities and challenges.

Furthermore, AI-based credit scoring systems can incorporate alternative data sources beyond traditional financial records, such as mobile phone usage, utility payments, social behavior patterns, and online transaction histories. By leveraging these diverse data points, AI models can generate more comprehensive risk profiles, allowing lenders to assess the creditworthiness of individuals who might otherwise be excluded from formal financial systems. This approach is particularly relevant for young adults, freelancers, and small business owners in South Korea, many of whom have limited or no formal credit history.

In addition, the integration of AI in credit assessment has the potential to improve efficiency and reduce operational costs for financial institutions. Automated decision-making can streamline loan approval processes, reduce human error, and enable faster responses to market demands. However, the increased reliance on algorithms also introduces risks, such as opaque decision-making processes and potential algorithmic biases, which could disproportionately affect certain demographic groups (Jan & Ahmed, 2025).

Therefore, this study emphasizes a balanced perspective, exploring both the advantages and limitations of AI-based credit scoring for financial inclusion. By examining practical applications, policy implications, and ethical considerations, the research aims to provide insights for policymakers, financial institutions, and technology developers on how to implement AI-driven credit systems that are fair, transparent, and effective in expanding access to financial services in South Korea (Darji, 2025).

Research

This study uses a comprehensive approach to investigate the role of AI-based credit scoring in enhancing financial inclusion in South Korea. The methodology integrates both qualitative and quantitative techniques to capture the technical, social, and ethical dimensions of AI-driven credit assessment systems. By combining multiple data sources and analytical strategies, the research aims to provide a complete understanding of how AI can improve access to financial services while addressing potential risks and challenges (Nallamala, 2021).

Data collection for this research involves a variety of sources to ensure depth and reliability. Primary data includes publicly available information from financial institutions, government reports, and national statistics on credit access, loan approvals, and underserved populations. These datasets provide insights into the current state of financial inclusion in South Korea and highlight gaps in traditional credit scoring systems. Secondary sources include academic publications, industry reports, and case studies on AI applications in finance and financial technology adoption, as well as regulatory frameworks governing AI use in credit evaluation. In addition, semi-structured interviews and surveys were conducted with banking professionals, FinTech developers, and policy experts. These interactions provided practical insights into real-world AI implementation, including operational challenges, data management, and regulatory compliance considerations (Rehman et al., 2025).

The analytical methods employed in this study are designed to examine the collected data from multiple perspectives. Descriptive analysis is used to summarize demographic and socio-economic factors affecting financial inclusion, such as income levels, credit history availability, and regional disparities. Comparative analysis evaluates the performance of AI-based credit scoring models

against traditional methods, focusing on predictive accuracy, inclusivity, and the ability to assess individuals with limited financial history. Case study analysis examines specific AI credit initiatives implemented by South Korean banks and FinTech companies to identify best practices, measurable outcomes, and potential challenges. Thematic analysis is applied to qualitative data from interviews and surveys, highlighting key issues such as algorithmic transparency, ethical use of AI, fairness in credit decisions, and data privacy concerns (“Automated credit scoring: Leveraging machine learning for financial inclusion”, 2024).

The methodological framework of this research combines technical evaluation with socio-economic and ethical considerations. This integrated approach allows the study to assess AI-based credit scoring systems not only in terms of predictive accuracy and operational efficiency but also regarding their impact on financial inclusion, equity, and accessibility. The framework emphasizes the importance of balancing technological innovation with responsible and ethical implementation to ensure that AI-based solutions serve all segments of the population effectively (Khan et al, 2025).

Finally, the study acknowledges certain limitations, including restricted access to proprietary AI algorithms used by banks and FinTech companies, as well as potential biases in survey responses or expert interviews. To mitigate these limitations, the study uses data triangulation, combining multiple sources and methods to ensure reliability and validity. Despite these constraints, the chosen methodology provides a robust and multidimensional analysis of AI-based credit scoring systems and their implications for financial inclusion in South Korea (“Machine learning applications in financial credit scoring research”, 2025).

This approach ensures that the research addresses both the practical and theoretical aspects of AI in credit assessment, providing valuable insights for policymakers, financial institutions, and technology developers (Chitturi, 2025).

Artificial intelligence (AI) has rapidly transformed the financial sector, introducing new tools and methodologies for evaluating creditworthiness, managing risks, and promoting financial inclusion. Traditional credit scoring methods, which primarily rely on historical financial data, such as income, employment history, and past loan repayment records, often fail to accurately assess the creditworthiness of individuals with limited financial history (Muñoz-Cancino et al., 2022). This limitation disproportionately affects young adults, freelancers, small business owners, and other underserved groups, preventing them from accessing loans and financial services. AI-based credit scoring addresses this gap by leveraging advanced algorithms to analyze a broader range of data, including structured and unstructured information, allowing for more inclusive and accurate credit assessments (Smith, 2025).

Ethical and regulatory considerations are therefore critical in implementing AI-based credit scoring. Transparency, accountability, and fairness must be integrated into algorithm design and deployment. Regulators in South Korea have begun emphasizing guidelines for ethical AI use, including principles for data privacy, consent, and responsible algorithmic decision-making. Compliance with these standards ensures that AI-driven credit systems not only enhance efficiency and accuracy but also protect consumer rights and promote social equity (Li et al., 2024).

Moreover, the use of AI in credit scoring creates opportunities for innovation in financial products. Personalized lending solutions, dynamic interest rates, and risk-adjusted loan offerings can be developed using predictive models, allowing lenders to cater to diverse customer needs. These innovations can encourage entrepreneurship, support small businesses, and provide financial security to households that were previously excluded from formal financial systems (“Machine learning powered financial credit scoring: A systematic literature review”, 2026).

In summary, AI-based credit scoring represents a transformative tool for enhancing financial inclusion in South Korea. By expanding access to credit for underserved populations, improving operational efficiency, and enabling innovative financial products, AI has the potential to reshape the landscape of banking and financial services. However, the successful implementation of these systems requires careful attention to ethical, regulatory, and technical considerations to ensure fairness, transparency, and accountability. The integration of AI into credit scoring not only addresses

limitations of traditional methods but also promotes equitable access to financial resources, supporting economic growth and social inclusion (Hoang et al., 2021).

Conclusion

AI-based credit scoring has emerged as a powerful tool for enhancing financial inclusion, particularly in technologically advanced economies such as South Korea. By leveraging advanced algorithms and analyzing both traditional and alternative data sources, AI systems can more accurately assess credit risk and provide access to financial services for individuals who are often excluded by conventional credit scoring methods. This includes young adults, freelancers, small business owners, and other underbanked populations.

The study highlights that AI-based credit scoring not only improves predictive accuracy but also enhances operational efficiency for financial institutions by automating loan assessment, reducing human error, and accelerating decision-making processes. Additionally, AI-driven systems enable innovation in financial products, such as personalized lending solutions and dynamic interest rate models, which can further support entrepreneurship and economic growth.

However, the adoption of AI in credit assessment raises significant ethical, regulatory, and technical challenges. Issues such as algorithmic bias, transparency, data privacy, and accountability must be carefully addressed to ensure that AI systems are fair and trustworthy. Proper regulatory oversight, adherence to ethical AI guidelines, and ongoing monitoring of algorithmic performance are essential to maximize the benefits of AI while minimizing potential risks.

Overall, AI-based credit scoring represents a transformative approach that can contribute substantially to financial inclusion in South Korea. When implemented responsibly, it has the potential to provide equitable access to financial resources, foster economic participation, and support social and economic development, making it an essential component of modern financial ecosystems.

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Received: 07.06.2025

Accepted: 14.11.2025