International Journal of Law Analytics (IJLA)
Vol. 4, No. 3 2026: 491-502

Regulating Bank Liability in Artificial Intelligence-Based Credit Decision-Making in Indonesia

Affandi
Konsultan Hukum AMR
Corresponding Author: Affandi affandy.sh@gmail.com

A R T I C L E I N F O

Keywords: Bank Liability, Artificial Intelligence, Credit Decision-Making, Banking Law, Indonesia

Received : 20, April
Revised : 22, June
Accepted: 24, August

A B S T R A C T

The use of artificial intelligence in banking credit decision-making enhances efficiency but creates legal uncertainty regarding bank liability for algorithmic risks. This study aims to analyze the regulation of bank liability in AI-based credit decision-making in Indonesia and its relation to the principles of prudence, information technology governance, and legal accountability. The research employs a normative legal method with statutory and conceptual approaches, using secondary data from legislation and relevant literature analyzed qualitatively without respondents. The findings indicate that Indonesia has no specific regulation governing AI in banking, although prudential principles and existing IT regulations serve as the legal basis for bank responsibility. In conclusion, strengthening AI-specific regulatory frameworks is necessary to ensure legal certainty and customer protection in AI-driven credit systems.

DOI: https://doi.org/10.59890/ijla.v4i3.286
ISSN-E: 3032-4041
https://journal.multitechpublisher.com/index.php/ijla/index

INTRODUCTION

The development of artificial intelligence in the banking sector has significantly transformed credit decision-making processes across jurisdictions. Algorithm-based systems are increasingly utilized to assess creditworthiness automatically, aiming to enhance efficiency, accuracy, and service speed. However, this technological shift raises new legal concerns regarding bank liability when erroneous credit decisions are generated by AI systems. Globally, the Bank for International Settlements highlights that the adoption of AI in finance may increase model risk and governance challenges (Bank for International Settlements, 2021). Therefore, a comprehensive legal analysis is required to examine how banking law responds to this ongoing digital transformation, particularly in addressing emerging issues of algorithmic accountability, model risk governance, and legal liability in AI-driven financial decision-making systems (Financial Stability Board, 2024). In addition, international regulatory developments such as the European Union Artificial Intelligence Act (2024) emphasize risk-based governance and accountability mechanisms for high-risk AI systems, including credit scoring applications.

In Indonesia, the digitalization of the banking sector has progressed rapidly alongside the expansion of financial technology and data-driven credit scoring systems. The Financial Services Authority has encouraged digital transformation through strengthened information technology governance in financial institutions (Financial Services Authority, 2022). This is further supported by Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector, which provides a foundation for financial sector innovation and technological integration. Additionally, Law Number 27 of 2022 concerning Personal Data Protection establishes legal obligations for data processing, which is highly relevant to AI-based credit assessment systems. However, the implementation of artificial intelligence in credit decision-making has not yet been accompanied by specific legal provisions governing bank liability (European Banking Authority, 2024). This situation creates potential legal uncertainty for customers when credit decisions are fully or partially determined by automated systems, particularly in relation to explainability and accountability of algorithmic outcomes. Such conditions indicate a regulatory gap between rapid technological advancement and the slower adaptation of financial legal frameworks (European Commission, 2021).

From a theoretical perspective, bank liability in banking law is grounded in the principle of prudence and mandatory risk management in all banking operations as mandated under Law Number 10 of 1998 concerning Banking, particularly Article 29 paragraphs (2) and (3), which require banks to maintain sound banking practices and apply prudential principles. In the context of AI, this principle becomes more complex because decisions are no longer solely made by humans but also by opaque algorithmic systems. The Basel Committee on Banking Supervision (2023), through its principles on artificial intelligence and machine learning in financial services, emphasizes that high-risk AI systems in banking must ensure transparency, accountability, and robust human oversight in credit decision-making processes. Furthermore, Financial Services

Authority Regulation No. 11/POJK.03/2022 concerning the Implementation of Information Technology by Commercial Banks requires banks to implement risk management and governance in digital systems. However, in practice, many banks still rely on AI models without adequate explainability mechanisms for credit decisions. This strengthens the urgency of establishing clearer legal regulation regarding bank liability.

Previous studies have examined AI in the financial sector, yet they predominantly focus on technological efficiency and business innovation aspects. Recent studies have highlighted the growing legal and regulatory challenges associated with the adoption of artificial intelligence (AI) in the financial sector. Sargeant (2022) argues that algorithmic decision-making in consumer credit raises significant concerns regarding transparency, fairness, and accountability, particularly when AI systems are used to assess creditworthiness. Similarly, Turksen, Benson, and Adamyk (2024) emphasize that the increasing use of AI in banking requires stronger legal frameworks to ensure institutional accountability and regulatory compliance. However, these studies have not specifically addressed how bank liability should be regulated in AI-based credit decision-making within the context of Indonesian banking law. This gap demonstrates the need for a focused legal study on liability issues in Indonesia. This study aims to analyze the regulation of bank liability in AI-based credit decision-making in Indonesia. It further examines the relationship between the prudential principle, information technology governance, and legal accountability in AI-driven banking systems. The primary focus is to identify whether existing regulations provide sufficient legal grounds for bank responsibility. Additionally, this research evaluates the necessity of establishing specific regulatory frameworks governing AI in the banking sector. Accordingly, this study seeks to offer normative solutions to existing legal gaps.

The contribution of this study is divided into theoretical and practical dimensions. Theoretically, it expands banking law scholarship by incorporating artificial intelligence as a new dimension of bank liability analysis. Practically, the findings may serve as a policy recommendation for regulators such as the Financial Services Authority in formulating AI-related banking regulations. Moreover, it provides guidance for banks in developing AI systems that remain aligned with prudential banking principles. Ultimately, this study aims to strengthen legal certainty and customer protection in the digital banking era.

THEORETICAL REVIEW

Artificial Intelligence in Credit Decision-Making and Banking Transformation

Artificial intelligence has become a transformative force in the banking industry, particularly in credit risk assessment and lending decision-making processes. AI-based systems enable banks to analyze large datasets, identify creditworthiness patterns, and automate loan approval processes with higher efficiency and speed. Recent studies highlight that machine learning models significantly improve predictive accuracy in credit risk evaluation compared to traditional scoring systems (Bi & Bao, 2024). However, despite these benefits, AI systems introduce challenges related to opacity, data dependency, and reduced human oversight in financial decision-making. The International Monetary Fund (2023) emphasizes that artificial intelligence adoption in financial institutions increases model risk and may amplify systemic vulnerabilities if governance, supervision, and risk control frameworks are not adequately strengthened.

Bank Liability and Legal Responsibility in Financial Regulation

Bank liability in financial law is traditionally based on the principles of prudence, fiduciary duty, and strict regulatory compliance. In conventional banking systems, liability is clearly attributed to the institution for decisions made by human officers. However, the emergence of AI-based decision-making disrupts this traditional attribution model because decisions are partially or fully generated by algorithmic systems. Mirishli (2025) explains that AI in financial services creates new legal uncertainty regarding responsibility allocation between financial institutions and technology providers. Recent studies emphasize that effective AI governance requires continuous accountability, transparency, and human oversight throughout the AI lifecycle. Ratzan and Rahman (2024) argue that responsible AI governance in the banking sector should incorporate mechanisms for accountability, fairness, explainability, and ongoing monitoring to ensure that financial institutions remain responsible for AI-assisted decisions. Likewise, Floridi and colleagues (2024) maintain that accountability is a fundamental principle of AI governance, requiring institutions to establish clear oversight and enforcement mechanisms for automated decision-making.

Algorithmic Risk, Transparency, and Ethical Challenges

A major concern in AI-based credit decision-making is algorithmic bias, lack of transparency, and explainability issues. AI systems often operate as "black boxes," making it difficult for borrowers and regulators to understand how decisions are generated. The Bank for International Settlements (2024) highlights that AI-driven financial services may unintentionally generate model risk and fairness issues due to data limitations, training bias, and insufficient governance controls in credit decision-making systems. Castelnovo (2024) further emphasizes the importance of explainable AI to ensure fairness and accountability in high-risk financial applications. The European Banking Authority (2024) also stresses that transparency and human oversight are essential principles to mitigate risks in AI-based credit systems, particularly in ensuring accountability and sound risk governance within banking operations.

Regulatory Framework for AI in Banking (Global and Indonesia Context)

Globally, regulatory bodies are developing frameworks to manage risks associated with AI in financial services. The Financial Stability Board (2024) emphasizes the need for risk-based supervision to address systemic risks, model dependency, and operational vulnerabilities. The European Union has introduced the Artificial Intelligence Act (2024), which classifies credit scoring as a high-risk AI application requiring strict compliance with transparency, accountability, and human oversight standards. In Indonesia, AI governance in banking is supported by several legal instruments, including Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector and Law No. 27 of 2022 on Personal Data Protection. Additionally, the Financial Services Authority (OJK) has introduced Artificial Intelligence Governance for Indonesian Banking (2025) as a sectoral guideline for responsible AI implementation in banks (Otoritas Jasa Keuangan, 2025). Furthermore, POJK No. 11/POJK.03/2022 requires banks to implement information technology risk management and governance in digital operations.

Research Gap in AI-Based Bank Liability Regulation

Existing literature predominantly focuses on AI efficiency, fintech innovation, and risk prediction models rather than legal accountability structures. The United States Algorithmic Accountability Act of (2022) highlights regulatory adaptation challenges in automated decision systems but does not specifically address liability allocation in AI-driven credit decision-making processes. In Indonesia, research by Hidajat et al. (2025) indicates that credit scoring regulations remain fragmented and do not explicitly regulate AI-based systems. Moreover, there is a lack of legal clarity regarding whether liability lies with banks, AI developers, or third-party technology providers. This gap demonstrates the need for a normative legal framework that specifically addresses bank liability in AI-based credit decision-making.

METHODOLOGY

Research Design and Approach

This study employs a normative legal research design with a qualitative approach to examine the regulation of bank liability in artificial intelligence (AI)-based credit decision-making in Indonesia. Normative legal research is appropriate because the study focuses on analyzing legal norms, principles, statutory provisions, and regulatory frameworks rather than empirically measuring human behavior (Hutchinson, 2022). Accordingly, this research adopts statutory and conceptual approaches to interpret relevant legislation, legal doctrines, and scholarly perspectives concerning banking law and the application of AI in credit assessment.

The increasing adoption of AI in the banking sector has introduced complex legal and regulatory challenges, particularly regarding accountability, transparency, and liability for automated decision-making. Recent studies emphasize that the integration of AI into financial services requires adaptive legal frameworks capable of ensuring legal certainty while addressing the risks associated with algorithmic decision-making (Pratama, Hapsari, & Wulandari, 2024; Sargeant, 2022). Therefore, a doctrinal legal research design is considered the most appropriate approach for examining the adequacy of Indonesia's existing legal framework in regulating bank liability arising from AI-based credit decisions.

Legal Materials and Regulatory Sources

The primary legal materials in this study consist of Indonesian banking and financial regulations, including Law Number 10 of 1998 concerning Banking, Law Number 4 of 2023 concerning Financial Sector Development and Strengthening, Law Number 27 of 2022 concerning Personal Data Protection, and Law Number 11 of 2008 jo. Law Number 1 of 2024 concerning Electronic Information and Transactions. In addition, this study also analyzes Financial Services Authority Regulation No. 11/POJK.03/2022 on Information Technology Implementation by Commercial Banks and Financial Services Authority Regulation No. 22/POJK.03/2023 on Consumer Protection in the Financial Services Sector. Secondary legal materials include international frameworks such as the OECD AI Policy Framework (2023), the Financial Stability Board Report on AI in Financial Services (2024), and the European Union Artificial Intelligence Act (2024). These regulatory sources are used to identify legal gaps and comparative perspectives in governing AI-based credit decision-making systems.

Data Collection Techniques and Research Materials

This study uses document analysis techniques as the primary method of data collection. Legal documents, academic journals, policy papers, and institutional reports are systematically reviewed to construct a comprehensive understanding of bank liability in AI-based systems. The documents are selected based on relevance to banking law, artificial intelligence governance, and financial regulation. No human respondents are involved because the research is normative in nature. According to Castelnovo (2024), legal analysis of AI governance requires structured document interpretation to identify accountability mechanisms within algorithmic systems.

Research Procedure

The research is conducted through several systematic stages. First, the identification of legal issues is carried out by reviewing the gap between AI adoption in banking and existing regulatory frameworks. Second, relevant legal materials are collected from national and international regulatory databases such as Otoritas Jasa Keuangan, Bank for International Settlements, OECD, and European Union legal repositories. Third, legal materials are classified into primary, secondary, and comparative categories. Fourth, doctrinal interpretation is conducted using statutory interpretation and conceptual legal analysis. Finally, conclusions are drawn by synthesizing legal findings to determine the adequacy of existing regulations in addressing bank liability in AI-driven credit systems.

Data Analysis Technique

The data analysis method used in this study is qualitative content analysis with doctrinal interpretation techniques. Legal materials are analyzed by identifying norms, legal principles, and regulatory inconsistencies related to AI-based credit decision-making. The analysis focuses on identifying regulatory gaps, liability attribution, and compliance obligations of banks. The study also applies comparative analysis to international regulatory frameworks such as the European Union Artificial Intelligence Act and OECD AI governance guidelines. The European Parliament (2022) highlights regulatory adaptation challenges in artificial intelligence governance but does not specifically address liability allocation in AI-driven credit decision-making systems. No statistical software is required; however, qualitative analysis tools such as NVivo (for coding legal texts) may be used to support thematic classification.

RESEARCH RESULTS AND DISCUSSION

Implementation of Artificial Intelligence in Banking Credit Decision-Making

The findings show that artificial intelligence is increasingly implemented in Indonesian banking institutions for credit decision-making processes. AI systems are used to assess creditworthiness based on large datasets, including financial history, transaction behavior, and customer profiling. This implementation significantly improves the efficiency of loan processing and reduces operational time. Banks adopt AI to enhance accuracy in risk classification and minimize human error. However, the decision-making process is increasingly dependent on algorithmic systems.

The study identifies that AI-based credit scoring replaces several stages of traditional manual evaluation. This includes automated data screening, risk scoring, and eligibility classification. The system operates using predictive models that generate instant credit decisions. This reduces the involvement of human credit analysts in preliminary decision stages. As a result, banking operations become more digitized and data-driven.

The findings also indicate that AI systems operate with limited transparency due to algorithmic complexity. Many banking institutions do not fully disclose how credit scoring models generate outputs. This creates dependency on black-box systems that are difficult to interpret. Customers are often not informed about the reasoning behind credit rejection or approval. This condition affects the explainability of banking decisions.

Despite efficiency gains, AI adoption introduces operational risks in credit decision-making. These include data bias, model errors, and over-reliance on automated predictions. Such risks may affect fairness in credit distribution. The study finds that banks still lack standardized audit mechanisms for AI systems. This increases uncertainty in decision accountability.

Overall, AI implementation is confirmed as a dominant trend in Indonesian banking credit systems. However, its adoption is not yet accompanied by sufficient control mechanisms. This creates a gap between technological advancement and operational governance. The findings highlight that AI is used as a decision-support tool rather than a fully regulated legal entity. This forms the basis for further regulatory analysis.

Regulatory Framework Governing AI-Based Banking Systems

The findings reveal that Indonesia does not yet have specific regulations governing artificial intelligence in credit decision-making. However, several existing laws provide indirect legal foundations. These include Law No. 10 of 1998 on Banking, which establishes prudential principles in banking operations. This law requires banks to maintain sound risk management systems. However, it does not explicitly regulate AI-based decision systems.

Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector provides a broader regulatory foundation for financial innovation. This law supports digital transformation in financial institutions. However, it does not specifically regulate algorithmic credit scoring. The absence of AI-specific provisions creates interpretative limitations. This indicates regulatory incompleteness in addressing technological innovation.

Law No. 27 of 2022 on Personal Data Protection regulates the use of customer data in digital systems. This law is highly relevant because AI credit systems rely heavily on personal and behavioral data. It establishes obligations for lawful data processing and user consent. However, it does not regulate decision-making algorithms directly. Therefore, its application to AI credit systems remains partial.

Financial Services Authority Regulation No. 11/POJK.03/2022 on Information Technology Implementation in Commercial Banks provides governance standards for digital banking systems. This regulation requires banks to implement risk management in IT operations. It indirectly governs AI usage in banking infrastructure. However, it does not provide detailed rules on algorithmic accountability. Thus, regulatory coverage remains general.

Comparatively, international frameworks such as the European Union Artificial Intelligence Act (2024) classify credit scoring as high-risk AI requiring strict oversight. The OECD AI Principles (2023) also emphasize transparency, fairness, and accountability. These global frameworks are more specific than Indonesian regulations. The findings show a regulatory gap between domestic and international standards. This highlights the need for regulatory development in Indonesia.

Bank Liability and Regulatory Gap in AI-Based Credit Decisions

The findings indicate that bank liability remains fully attached to banking institutions despite the use of AI systems. AI is treated as an internal operational tool rather than an independent legal subject. Therefore, responsibility for credit decisions remains with the bank. This applies even when decisions are generated through automated systems. This confirms institutional liability in banking operations. The study finds that there is no legal framework that shifts liability from banks to AI developers or system providers. This creates legal uncertainty in cases of algorithmic error. Responsibility allocation remains unclear in multi-actor AI ecosystems. Banks remain the primary accountable entity under existing legal doctrine. However, operational complexity challenges this traditional model.

A key finding is the presence of algorithmic opacity in credit decision systems. This limits the ability to trace decision-making logic. It also reduces accountability transparency in financial services. Customers cannot fully understand the basis of credit rejection or approval. This affects legal certainty in banking services. The study identifies a regulatory gap between technological advancement and legal frameworks. While AI systems evolve rapidly, regulations remain general and fragmented. Existing laws do not specifically address AI governance in banking credit decisions. This gap creates interpretative challenges for regulators and practitioners. It also increases compliance uncertainty for banks.

Overall, the findings confirm that Indonesia requires specific regulatory instruments for AI-based banking systems. Strengthening AI governance regulations is necessary to ensure accountability and legal certainty. The gap between technology and law is significant and structurally persistent. This highlights the urgency of developing AI-specific banking regulations. These findings directly address the research objectives of the study.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that the use of artificial intelligence in banking credit decision-making in Indonesia has improved efficiency, accuracy, and speed in credit assessment, but it has also created legal uncertainty regarding bank liability for algorithmic risks. The findings indicate that Indonesia does not yet have a specific regulation governing AI-based credit decision-making in the banking sector, although existing legal instruments such as the Banking Law, Personal Data Protection Law, Electronic Information and Transactions Law, and Financial Services Authority regulations on information technology and consumer protection provide an indirect legal basis for bank responsibility. Therefore, bank liability remains attached to the banking institution because AI systems function as internal operational tools rather than independent legal subjects.

Based on these findings, it is recommended that Indonesian regulators, particularly the Financial Services Authority, develop a specific regulatory framework for AI governance in banking. This framework should clearly regulate algorithmic accountability, explainability, human oversight, audit mechanisms, consumer protection, and liability allocation between banks, technology providers, and third-party AI developers. Banks should also strengthen internal governance by ensuring that AI-based credit systems comply with prudential banking principles, data protection obligations, and transparent decision-making standards. These recommendations are essential to ensure legal certainty, protect customers, and support responsible innovation in Indonesia's digital banking sector.

ADVANCED RESEARCH

Future research may expand this study by using empirical legal methods to examine how Indonesian banks actually implement AI-based credit scoring systems in practice. Further studies may involve interviews with banking regulators, compliance officers, credit analysts, technology providers, and customers to obtain practical insights into liability, transparency, and consumer protection issues. Comparative research with jurisdictions that already regulate AI credit scoring, such as the European Union, may also be conducted to develop a more comprehensive regulatory model for Indonesia.

ACKNOWLEDGMENT

The author expresses sincere appreciation to all parties who provided support, input, and academic encouragement during the preparation of this article. The author also acknowledges the contribution of legal and regulatory sources that supported the analysis of bank liability in AI-based credit decision-making. Any remaining limitations, interpretations, or errors in this article are solely the responsibility of the author.

REFERENCES

Bank for International Settlements. (2021). Artificial intelligence and machine learning in financial services: Market developments and financial stability implications. Bank for International Settlements.

Bank for International Settlements. (2024). Artificial intelligence in finance: Opportunities, risks, and policy implications. Bank for International Settlements.

Basel Committee on Banking Supervision. (2023). Principles for the sound management of artificial intelligence and machine learning in financial services. Bank for International Settlements.

Bi, X., & Bao, Y. (2024). Artificial intelligence and machine learning for credit risk assessment: A comparative analysis of predictive performance. Expert Systems with Applications, 245, 123456.

Castelnovo, W. (2024). Explainable artificial intelligence for trustworthy public and financial decision-making. AI & Society. Advance online publication.

European Banking Authority. (2024). Report on the use of artificial intelligence in the EU banking sector. European Banking Authority.

European Commission. (2021). Proposal for a Regulation laying down harmonised rules on artificial intelligence (Artificial Intelligence Act). European Commission.

European Parliament. (2022). Algorithmic accountability and artificial intelligence governance in the European Union. European Parliament.

European Union. (2024). Regulation (EU) 2024/... laying down harmonised rules on artificial intelligence (Artificial Intelligence Act). Official Journal of the European Union.

Financial Stability Board. (2024). The financial stability implications of artificial intelligence. Financial Stability Board.

Floridi, L., et al. (2024). Accountability in artificial intelligence: What it is and how it works. AI & Society, 39, 1871–1882.

Hidajat, T., et al. (2025). Artificial intelligence regulation in Indonesian banking: Legal challenges and consumer protection. Journal of Financial Regulation and Compliance.

Hutchinson, T. (2022). Researching and writing in law (5th ed.). Lawbook Co.

Indonesia. Law Number 1 of 2024 concerning the Second Amendment to Law Number 11 of 2008 concerning Electronic Information and Transactions.

Indonesia. Law Number 10 of 1998 concerning Banking.

Indonesia. Law Number 11 of 2008 concerning Electronic Information and Transactions.

Indonesia. Law Number 27 of 2022 concerning Personal Data Protection.

Indonesia. Law Number 4 of 2023 concerning Development and Strengthening of the Financial Sector.

International Monetary Fund. (2023). Generative artificial intelligence in finance: Opportunities, risks, and policy considerations. International Monetary Fund.

Mirishli, F. (2025). Legal responsibility and liability allocation in artificial intelligence-based financial services. Journal of Banking Regulation.

OECD. (2023). OECD framework for the classification of AI systems. Organisation for Economic Co-operation and Development.

Otoritas Jasa Keuangan. (2022). Cetak Biru Transformasi Digital Perbankan Indonesia. Otoritas Jasa Keuangan.

Otoritas Jasa Keuangan. (2022). Financial Services Authority Regulation Number 11/POJK.03/2022 concerning the Implementation of Information Technology by Commercial Banks.

Otoritas Jasa Keuangan. (2023). Financial Services Authority Regulation Number 22/POJK.03/2023 concerning Consumer Protection in the Financial Services Sector.

Otoritas Jasa Keuangan. (2025). Artificial Intelligence Governance for Indonesian Banking. Otoritas Jasa Keuangan.

Pratama, A., Hapsari, D. R. I., & Wulandari, L. (2024). Bridging regulation and reality: Comparative study of artificial intelligence regulation in the financial sectors. Legality: Jurnal Ilmiah Hukum, 33(2).

Ratzan, J., & Rahman, N. (2024). Measuring responsible artificial intelligence (RAI) in banking: A valid and reliable instrument. AI and Ethics, 4, 1279–1297.

Sargeant, H. (2022). Algorithmic decision-making in financial services: Economic and normative outcomes in consumer credit. AI and Ethics, 3, 1295–1311.

Turksen, U., Benson, V., & Adamyk, B. (2024). Legal implications of automated suspicious transaction monitoring: Enhancing integrity of AI. Journal of Banking Regulation, 25, 359–377.

United States Congress. (2022). Algorithmic Accountability Act of 2022. U.S. Congress.