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Legal Accountability for Artificial Intelligence in Financial Services: Consumer Protection and Regulatory Challenges in Indonesia

[1]Muh. Ibnu Sholeh
[1] STAI KH Muhammad Ali Shodiq Tulungagung, Indonesia
[1]indocelllular@gmail.com

**Correspondence Email: indocelllular@gmail.com*

Abstract: *The increasing use of artificial intelligence (AI) in financial services raises legal challenges concerning accountability, algorithmic transparency, and consumer protection. This study examines how Indonesian law addresses responsibility for AI-driven financial decisions, the safeguards available to consumers, and the regulatory measures needed to strengthen legal accountability. It employs normative legal research using statutory and conceptual approaches, supported by documentary analysis of legislation, regulatory instruments, and scholarly literature. The analysis indicates that AI-related accountability requires more than identifying technical errors; it involves assessing applicable legal duties, the roles of relevant actors, the potential harm suffered, and the availability of effective remedies. Consumer protection also depends on accessible explanations, appropriate human review, reliable data, and effective complaint-handling procedures. However, the interaction between general legal obligations and AI governance arrangements presents challenges in determining responsibility and ensuring enforceable safeguards. This study proposes an integrated analytical framework comprising three dimensions: allocation of legal responsibility, algorithmic transparency and safeguards, and consumer redress. The framework provides a structured basis for evaluating existing legal instruments and identifying areas requiring regulatory clarification. It contributes to normative legal scholarship by connecting AI accountability with enforceable consumer protection, while recognizing that the practical effectiveness of the proposed framework requires further empirical assessment.*

Keywords: *Artificial Intelligence, Legal Accountability, Financial Services, Consumer Protection, Indonesia.*

INTRODUCTION

Artificial intelligence (AI) is transforming financial services through applications such as credit scoring, fraud detection, risk assessment, and automated customer profiling. Although these technologies can improve efficiency, they also raise legal concerns regarding algorithmic transparency, discriminatory outcomes, personal data protection, and responsibility for consumer harm. These challenges become more complex when financial decisions involve multiple actors, including financial institutions, AI developers, and technology providers. Consequently,

establishing legal accountability requires clear rules concerning institutional responsibility, consumer rights, and remedies for harmful automated decisions.

AI-driven financial decisions can directly affect consumers' access to credit, financing terms, and economic opportunities. Inaccurate data, biased algorithms, or inadequate human oversight may produce decisions that are difficult for consumers to understand or challenge. Martin and Waldman (2023) demonstrate the importance of examining both decision-making processes and outcomes when assessing the legitimacy of algorithmic decisions. In financial services, this issue raises a fundamental legal question: how can consumers obtain meaningful explanations and effective remedies when an automated decision adversely affects their interests?

Indonesia has begun developing governance arrangements for AI in financial services, particularly in banking. However, the existence of governance principles does not automatically determine how liability should be allocated when an AI system causes harm. Zakiyah et al. (2026) examine the liability of AI providers within Indonesia's regulatory landscape and identify difficulties associated with algorithmic opacity and conventional fault-based liability. Their analysis highlights the need to clarify the obligations of relevant actors and strengthen the enforceability of accountability requirements.

Consumer protection presents a related challenge because AI-related harm may involve several overlapping legal issues, including inaccurate personal data, insufficient disclosure, unfair treatment, and ineffective complaint mechanisms. Poernomo et al. (2026) examine regulatory gaps in Indonesia's consumer protection framework in the AI-driven digital economy and propose a more preventive approach to algorithmic risk. Meanwhile, Damayanti and Arifin (2026) discuss legal certainty concerning AI-related crimes in Indonesia's banking sector, particularly the implications for data protection and the allocation of responsibility. These studies provide relevant foundations for assessing whether existing legal instruments adequately address the risks associated with AI-driven financial decisions.

The regulatory challenge is not limited to identifying applicable rules; it also concerns their implementation and enforceability. García-Llorente and Olmeda (2026) show that AI governance in banking requires supervisory mechanisms capable of translating general principles into enforceable institutional obligations. This perspective is relevant to Indonesia because consumer

protection depends not only on the existence of legal standards but also on clear responsibility, appropriate oversight, and accessible remedies. Accordingly, the relationship between financial regulation, data protection, and general liability principles requires systematic legal examination.

Although these studies address AI liability, consumer protection, legal certainty, and financial-sector governance, further analysis is needed to connect these dimensions within a single framework specifically focused on consumer harm arising from AI use in Indonesian financial services. This study therefore examines the allocation of responsibility among relevant actors, the legal safeguards applicable to AI-driven decisions, and the mechanisms available to consumers seeking redress. Its proposed contribution is an integrated analytical framework connecting legal accountability, algorithmic transparency, and consumer remedies. Rather than presuming that Indonesian law contains a complete regulatory vacuum, the study evaluates the scope and interaction of existing legal instruments to identify specific areas requiring clarification or improvement.

This study addresses three research questions: (1) How is legal accountability for the use of artificial intelligence in financial services established under Indonesia's existing legal framework? (2) To what extent does the Indonesian legal framework protect consumers from harmful, discriminatory, or opaque AI-driven financial decisions? and (3) How can the legal framework be strengthened to clarify responsibility, promote algorithmic transparency, and ensure effective consumer redress? Using normative legal research with statutory and conceptual approaches, this article analyzes relevant legislation, regulatory instruments, and scholarly literature. It seeks to develop a coherent legal framework for evaluating AI accountability and strengthening consumer protection in Indonesia's financial services sector.

METHOD

This study employs normative legal research to examine legal accountability for the use of artificial intelligence (AI) in financial services in Indonesia. Normative legal research focuses on legal norms, principles, and doctrines to develop reasoned legal arguments and assess the adequacy of applicable rules (Negara, 2023; Hariani & Jabbar, 2026). The study applies statutory and conceptual approaches. The statutory approach examines legislation and regulatory instruments

governing financial services, consumer protection, personal data protection, and AI governance, while the conceptual approach analyzes legal accountability, algorithmic transparency, liability, and consumer redress.

The study uses documentary research to collect primary and secondary legal materials. Primary legal materials include Indonesian legislation and relevant regulatory instruments, particularly Law No. 8 of 1999 concerning Consumer Protection, Law No. 27 of 2022 concerning Personal Data Protection, and applicable Financial Services Authority regulations and AI governance guidance. Secondary legal materials comprise peer-reviewed journal articles and academic publications on AI liability, automated decision-making, financial regulation, and consumer rights. The materials are selected according to their relevance to the research questions, legal authority, and academic credibility. This approach is consistent with the distinction between normative legal research, which examines legal rules and their normative implications, and empirical research, which investigates how law operates in practice (McConville & Chui, 2017).

The collected materials are analyzed qualitatively through legal interpretation, doctrinal analysis, and normative synthesis. First, the relevant provisions are examined to identify the obligations and responsibilities of financial institutions and other actors involved in AI deployment. Second, the provisions are analyzed in relation to algorithmic opacity, potentially harmful or discriminatory decisions, and the allocation of liability. Third, the analysis evaluates the legal safeguards available to consumers seeking explanations, challenging adverse decisions, and obtaining remedies. The findings are synthesized into an analytical framework connecting legal responsibility, algorithmic transparency, and consumer redress. The framework is intended to identify specific areas requiring legal clarification or regulatory improvement without presuming that every adverse AI-driven decision automatically establishes liability.

RESULT AND DISCUSSION

1. Legal Accountability for AI-Driven Financial Decisions

Legal accountability for artificial intelligence (AI) in financial services requires distinguishing between the technical operation of an AI system and the legal responsibilities of the institutions that deploy it. AI is increasingly used for credit scoring, fraud detection, risk

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assessment, and customer profiling. Although these applications can improve efficiency, they may also produce inaccurate, discriminatory, or insufficiently explainable outcomes. Uzougbo et al. (2024) identify accountability and ethical responsibility as important challenges in AI-based financial services. From a legal perspective, however, an adverse outcome does not automatically establish liability. The assessment must identify the applicable legal duty, the conduct of the relevant actor, the harm suffered, and the relationship between that conduct and the resulting harm.

Responsibility may involve several actors, including financial institutions making or adopting decisions, developers designing AI systems, and third-party providers supplying software or data. Their responsibilities should be assessed according to their respective roles, control over the system, contractual relationships, and obligations under applicable law. Mazzini and Bagni (2023) demonstrate the importance of examining AI-related risks within the regulatory framework governing financial services, particularly where automated systems influence creditworthiness assessments. Accordingly, the involvement of an external technology provider does not, by itself, resolve the responsibility of a financial institution toward its customers. The relevant legal inquiry is whether each actor has fulfilled the obligations applicable to its role and whether the circumstances establish a basis for liability.

The difficulty of determining responsibility becomes more pronounced when an AI system operates through complex processes that are difficult to interpret or reconstruct. Lioliou et al. (2026) show that financial firms construct accountability through internal governance, external regulatory expectations, and disclosures concerning technological uncertainty. Their findings illustrate why accountability cannot depend solely on assigning responsibility after harm has occurred. Institutions also need documented decision-making procedures, appropriate risk controls, and records that allow consequential decisions to be reviewed. In Indonesia, these considerations should be assessed against applicable legislation and financial-sector regulations. The objective is to clarify the responsibilities of relevant actors without treating AI itself as an independent legal subject or presuming that every technical error constitutes unlawful conduct.

2. Consumer Protection and Algorithmic Transparency

Consumer protection in AI-driven financial services requires more than informing customers that automated technology is being used. Consumers may need understandable information about

the principal factors affecting a consequential decision, opportunities to correct inaccurate data, and procedures for challenging outcomes that adversely affect their financial interests. Černevičienė and Kabašinskas (2024) review the application of explainable AI in finance and identify its relevance to credit management, fraud detection, and other financial tasks. Their analysis indicates that explainability is important because complex models may produce predictions without providing explanations that are readily understood by affected individuals. From a legal perspective, the adequacy of an explanation should therefore be assessed according to whether it supports meaningful scrutiny of a decision.

Transparency does not necessarily require disclosing an entire algorithm or its source code. Depending on the circumstances, appropriate safeguards may include explaining the principal reasons for an adverse decision, identifying relevant categories of personal data, providing a process for correcting errors, and enabling review by an appropriately authorized person. Weber et al. (2024) examine explainable AI applications across finance, information systems, and computer science, highlighting the importance of traceability and interpretability in regulated financial environments. Their review supports a distinction between technical explainability and practical transparency. A system may provide technically valid explanations without giving consumers sufficient information to understand or contest a decision. Consumer protection therefore requires explanations and review procedures that are accessible and relevant to the interests affected.

The protection of consumers also depends on the availability of effective complaint and redress mechanisms. Zein et al. (2026) discuss how algorithmic opacity, bias, and limited explainability can affect consumer autonomy and access to remedies. Although their analysis addresses consumer-facing AI applications more broadly, the issues are relevant to financial services where automated decisions may affect access to credit or other financial products. In Indonesia, consumer protection and personal data protection provide important legal foundations for examining these risks. Their application must be considered alongside the specific rules governing the relevant financial service. These safeguards do not guarantee that every consumer will receive a particular financial outcome; rather, they support fair procedures, accountability, and the ability to seek correction or redress where legal rights may have been infringed.

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3. Regulatory Challenges in Indonesia

A central regulatory challenge concerns the relationship between general legal obligations and AI-specific governance arrangements. Financial services regulation, consumer protection law, and personal data protection law address different aspects of the relationship between institutions and consumers. However, a single AI-driven decision may raise questions about data accuracy, the fairness of an assessment, institutional oversight, and the adequacy of explanations. Mazzini and Bagni (2023) demonstrate how AI-related risks intersect with financial regulation, particularly in creditworthiness assessment. Their analysis provides a comparative perspective for evaluating the extent to which existing legal categories can address the consequences of automated financial decision-making in Indonesia.

A second challenge involves allocating responsibility when multiple actors contribute to a decision. An AI system may rely on external software, data providers, or third-party technical services, making it difficult to identify the source of an error. Spindler (2023) examines the legal implications of algorithmic credit scoring and regulatory proposals concerning AI and consumer credit, illustrating the significance of automated assessments for consumer rights and financial regulation. For Indonesia, the relevant issue is how existing legal obligations can be applied to identify responsible conduct and determine available remedies. Contractual arrangements, technical documentation, and internal review procedures may assist in establishing the respective roles of the parties, but they do not replace the need to assess applicable legal duties and the circumstances of each case.

Regulatory effectiveness also depends on the legal status and enforceability of the instruments governing AI use. Lioliou et al. (2026) demonstrate that organizational accountability and external regulatory expectations can interact in shaping how financial firms communicate and manage AI-related risks. However, internal governance commitments do not necessarily provide the same legal protection as binding statutory or regulatory obligations. In Indonesia, the Otoritas Jasa Keuangan's AI governance guidance for banking should therefore be assessed according to its scope and legal character, alongside applicable legislation and binding regulations. The analysis must distinguish existing legal obligations from supervisory expectations and voluntary practices.

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This distinction helps determine whether identified problems require improved implementation, clearer supervisory standards, or further regulatory clarification.

4. A Proposed Framework for AI Accountability and Consumer Redress

The preceding analysis supports an integrated framework for evaluating legal accountability in AI-driven financial services. The framework consists of three interconnected dimensions: allocation of legal responsibility, algorithmic transparency and safeguards, and consumer redress. These dimensions should be assessed together because consumers may be unable to challenge an adverse decision when responsibility is unclear, the reasons for the decision are inaccessible, or complaint procedures are ineffective. Zein et al. (2026) emphasize the relationship between transparency, human oversight, liability allocation, and the ability of consumers to challenge consequential AI-assisted decisions. Adapted to the Indonesian context, these concerns provide a basis for assessing how existing legal obligations can be connected to meaningful consumer protection.

The first dimension concerns responsibility allocation. Financial institutions, AI developers, data providers, and other relevant actors should be assessed according to their roles, control over the system, contractual relationships, and applicable legal duties. The second dimension concerns transparency and safeguards, including data accuracy, understandable explanations, documented decision processes, and meaningful human review where appropriate. The third dimension concerns consumer redress, including accessible complaint channels, correction of inaccurate information, reconsideration of disputed decisions, and compensation or other remedies where legally justified. These dimensions are mutually reinforcing. Transparency, for example, has limited practical value if consumers cannot use the information provided to request a review or exercise their legal rights.

The framework also incorporates a feedback mechanism connecting complaints and supervisory findings with institutional risk management. Financial institutions should document consequential AI decisions, identify relevant actors, investigate complaints, and correct deficiencies where necessary. Supervisory authorities can assess whether institutions fulfil their obligations and whether additional clarification is warranted. Technical research on transparent financial AI, such as the review by Khoozani et al. (2026), further illustrates the importance of

explainability and validation methods in credit-risk assessment and fraud detection. Nevertheless, technical transparency alone cannot determine legal liability. The proposed framework therefore connects technical safeguards with legal duties, institutional responsibility, and remedies available under applicable law.

The contribution of this framework lies in providing a structured method for examining the relationship between AI deployment and consumer protection. Rather than presuming that Indonesian law contains a complete regulatory vacuum, the framework enables the assessment of existing obligations, the distribution of responsibility, and the availability of effective remedies. It also distinguishes between a technical failure, a potentially harmful outcome, and a legally actionable violation. Further regulatory clarification may be justified where existing instruments do not adequately specify responsibilities or procedures, but such conclusions must follow from a provision-by-provision legal analysis. As a conceptual framework developed through normative research, the proposal provides a foundation for evaluating AI-driven financial services and formulating targeted recommendations for accountability and consumer redress in Indonesia.

CONCLUSION

This study concludes that legal accountability for artificial intelligence in Indonesian financial services must be assessed through the applicable obligations of financial institutions, technology providers, and other relevant actors. The use of AI does not automatically establish liability when an adverse outcome occurs. Rather, legal assessment requires identifying the relevant duty, the conduct of the responsible party, the harm suffered, and the relationship between that conduct and the resulting harm. Accordingly, accountability should be examined in relation to the roles and obligations of the actors involved, rather than attributing responsibility solely to the technical operation of an AI system.

The analysis further demonstrates that consumer protection depends on the relationship between algorithmic transparency, appropriate safeguards, and accessible remedies. Consumers need meaningful information about consequential automated decisions, opportunities to challenge inaccurate data or potentially unfair outcomes, and effective procedures for seeking review. In Indonesia, the interaction between general legal obligations, financial-sector regulation, personal

data protection, and AI governance creates a need for careful legal interpretation. The existence of governance guidance alone does not establish that every accountability issue has been resolved; its scope and legal force must be assessed alongside applicable binding legislation and regulations.

The principal contribution of this study is an integrated analytical framework connecting three dimensions: allocation of legal responsibility, algorithmic transparency and safeguards, and consumer redress. The framework provides a basis for examining existing legal obligations, identifying areas requiring clarification, and developing targeted regulatory recommendations without presuming a complete regulatory vacuum. Its practical implications include strengthening documentation of AI-driven decisions, clarifying the responsibilities of relevant actors, improving review and complaint mechanisms, and ensuring that consumers can pursue remedies where legal violations are established. Because this study relies on normative legal materials, it does not establish the actual effectiveness of these safeguards in practice. Future research should examine their implementation in specific financial services and assess how consumers, financial institutions, technology providers, and regulators experience AI-related accountability.

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