

COMPARATIVE LEGAL APPROACHES TO ARTIFICIAL INTELLIGENCE REGULATION IN PEER-TO-PEER LENDING

Nurhilmiyah¹
Indah Purnama Sari²
Hastina Febriaty³
Atikah Rahmi⁴
Asliani⁵

^{1,4,5}Faculty of Law, Universitas Muhammadiyah Sumatera Utara

²Faculty of Computer Science and Information Technology, Universitas Muhammadiyah Sumatera Utara

³Faculty of Economics and Business, Universitas Muhammadiyah Sumatera Utara

nurhilmiyah@umsu.ac.id

Abstract: *The rapid integration of artificial intelligence (AI) in peer-to-peer (P2P) lending platforms has transformed credit assessment, risk management, and service efficiency within the financial technology sector. However, the extensive use of AI also raises significant legal concerns, particularly related to transparency, accountability, consumer protection, and potential algorithmic bias. This paper examines and compares legal approaches to regulating artificial intelligence in P2P lending across selected jurisdictions. Using a normative legal research methodology and comparative legal approach, the study analyzes regulatory frameworks, policy instruments, and governance principles governing AI deployment in P2P lending services. The comparison highlights differences in regulatory emphasis, ranging from innovation-driven approaches to rights-based and risk-based regulatory models. The findings indicate that jurisdictions with comprehensive AI governance frameworks tend to provide stronger safeguards for consumers while maintaining support for financial innovation. Conversely, fragmented or sector-specific regulations often create regulatory gaps that may undermine legal certainty and financial inclusion objectives. This paper argues that an effective AI regulatory approach in P2P lending should balance technological innovation with legal accountability and inclusive finance principles. The study contributes to the discourse on fintech regulation by offering comparative insights that may inform policymakers in developing adaptive and inclusive legal frameworks for AI-driven financial services.*

Keywords: *Artificial Intelligence; Peer-to-Peer Lending; Fintech Regulation; Comparative Law; Consumer Protection.*

Introduction

The rapid advancement of artificial intelligence (AI) has significantly transformed the global financial technology sector, particularly on peer-to-peer (P2P) lending platforms, where algorithmic systems are increasingly being used for credit scoring, risk mitigation, and automated decision-making.

Previous research on the use of artificial intelligence analysis of factors affecting information sharing in fin-tech peer-to-peer lending; the role of anonymity and trust in the era of digital barter; a digital transformation framework and digital asset popularity assessment; external auditors' perceptions of the use of virtual reality in the audit process of financial statements; artificial intelligence technology pathways to reduce costs and improve e-commerce supply chain efficiency; customer preferences for online games, etc..(ICS&B 2022 - 2022 6th

International Conference on Software and e-Business», 2022). The use of AI by P2P fintech has potential benefits but raises consumer protection issues that have not been fully answered by existing Indonesian law. The legislative framework provides direction, but it needs to complement specific norms and firm enforcement so that consumers' rights to transparency, data privacy, and fairness are guaranteed in AI-based credit transactions.(Arjun Sulaeman, 2025)

Digitalization driven by technological advancements has increased competition between traditional banks and new financial service providers, leading to reduced costs and increased product diversity. This shift allows banks to adopt new business models, improve financial inclusion, and leverage customer data for personalized services. However, it also raises concerns about financial stability due to the risks posed by fintech and telecommunications that are eating away at the traditional banking area, potentially undermining the role of banks in credit creation and monetary policy transmission. Banks are required to innovate and adapt their business models to remain competitive, particularly through integrated financing and improved customer relationship management. The regulatory framework must evolve to keep up with the rapid technological changes in the financial sector.(Jameaba, 2023)

Literature Review

The ethical dilemma in algorithmic decision-making on fintech platforms, especially those engaged in peer-to-peer lending, e-wallets, and robo-advisory, revolves around three main issues, namely algorithmic bias, lack of transparency, and limited accountability. Despite positive efforts by fintech companies to implement fairness principles through internal audits and data adjustments, there are still gaps in the implementation of transparency and accountability principles, which can undermine users' trust in AI systems.(Agustinus Wardi; Galuh Aditya, 2025)

This research was conducted using normative legal research methods, with a comparative approach, and using qualitative data analysis.

The study confirms that the ethical dilemma in AI is not only a technical one, but also a structural and social one that requires a cross-disciplinary approach and strong organizational commitment. In addition, this study expands the literature on algorithmic ethics by providing a contextual overview of practices in Southeast Asia, particularly Indonesia, where regulation and ethical awareness are still in the development stage. Using a case study approach and in-depth analysis of qualitative data, this study develops a conceptual model of algorithmic ethics that can be a practical reference in designing, implementing, and evaluating fairness and accountability-based AI systems in the fintech ecosystem.(Agustinus Wardi; Galuh Aditya, 2025)

Future research is suggested to expand the scope of the case to include more types of fintech services and other geographic regions to gain a more thorough understanding.(Kanojia et al., 2026) User participation as directly affected stakeholders also needs to be included in the algorithm ethics evaluation process, through participatory audit models or open feedback systems. In addition, quantitative approaches and experimental modeling are needed to measure the real impact of algorithmic bias on decision outcomes, as well as to test the effectiveness of ethical interventions that have been implemented. At the policy level, further studies can examine how local regulations can adopt global ethical standards without hindering technological innovation, taking into account the typical socio-economic dynamics of the Southeast Asian region.(Nguyen & Ngo, 2021)

AI and fintech regulation is a global and regional approach, discussing studies that examine AI and fintech regulatory frameworks in various jurisdictions (e.g. the European Union, the United States, and Asia). The difference between *principle-based* and *risk-based* approaches, as well as the limitations of sectoral regulations in responding to the complexity of AI in P2P lending.(Nurhilmiah, N., Hasim Purba, Zulkarnain Sitompul, 2025)

The Syariah lens explains how gharar (uncertainty), fasakh (cancellation), and unjust enrichment shape agency disputes. Key changes include more flexible citizenship rules, end-to-end digital registration and renewal, clearer termination/compensation standards, and formal recognition of arbitration. Together, these measures improve contractual predictability and lower compliance friction, with early indications of increased market transparency and investor sentiment. Conclusion: These reforms signal a hybrid model—liberalization that aligns with global practices while maintaining a Sharia-based identity.(Alasmari & Alotaibi, 2026)

Comparative legal studies in technology regulation, using a comparative legal approach to assess the effectiveness of technology regulation. Through comparative methods, research on rules on artificial intelligence in peer to peer lending helps to identify best practices and normative gaps in AI regulation across countries, including Indonesia. As for regulations that protect consumers and maturity, the UK is often considered the best. For market size and technological innovation, the United States is at the forefront.(Fortune Business Insight reporter, 2026)

Ethics, algorithmic justice, and consumer protection, AI ethics, fairness, transparency, and explainability, especially related to the protection of financial services consumers. Almost all AFPI members use AI for credit scoring and risk control. AFPI and OJK emphasize algorithm transparency, avoiding bias, and maintaining the security of customer data in the use of AI.(Allen et al., 2021)

There is agreement among fintech researchers about the need for regulation to prevent discrimination and systemic injustice due to algorithm-based decisions.(Alasmari & Alotaibi, 2026). In Indonesia, operators of financial services institutions such as peer to peer lending are required to apply the principles of consumer and community protection in conducting business in accordance with the provisions of laws and regulations regarding the protection of consumers and the public in the financial services sector. This provision is expressly stated in Article 179 of the latest Financial Services Authority Regulation in the field of peer to peer lending, namely the Financial Services Authority Regulation No. 40 of 2024 concerning Information Technology-Based Joint Funding Services.

The perspective of Islamic values and digital financial inclusion is related to financial technology with Islamic values, such as justice ('adl), benefits (maslahah), and the prohibition of exploitation. The findings of Azhar Alam and the research team show a common perception of awareness of use, including the need and importance of the benefits of using technology. Commonalities in perceptions of reputation are also found in professionalism and reliability. On the other hand, the similarity in the perception of satisfaction occurs in the aspects of multifunctionality and ease of use. In addition, differences were found in the perception of data security. There are still suspicions about data security among Indonesian participants. There has been no study that directly compares Generation Z Muslims in the two countries who pay ZIS through fintech.(Ratnasari; & Chabibatul Mua'awanah; Raisa Aribatul Hamidah., 2022). However, there are still limited studies that explicitly integrate the perspective of Islamic law into AI regulations in P2P lending.

As of January-February 2026, there are at least 11 syariah online loan providers (fintech P2P lending) that are licensed and supervised by the OJK, including Ammana, ALAMI, Dana Syariah, Duha Syariah, Papatupi Syariah, and Qazwa. The total number of conventional fintech lending plus sharia licensed as of early 2025 is 97 companies.(Wijaya, 2026)

Result And Discussion

The comparative analysis reveals that regulatory approaches to artificial intelligence in peer-to-peer lending vary significantly across jurisdictions, reflecting different legal traditions, levels of technological maturity, and policy priorities. Jurisdictions adopting a risk-based regulatory model tend to provide more nuanced oversight of AI-driven credit assessment, particularly in addressing algorithmic bias and systemic risk. However, such approaches often face implementation challenges due to limited supervisory capacity and rapid technological change.(Domenico, 2022)

From a resilience perspective, the findings indicate that effective AI regulation contributes to the stability and sustainability of digital financial ecosystems. Clear legal standards on transparency, accountability, and human oversight enhance public trust in P2P lending platforms and mitigate the risk of exclusion or exploitation of vulnerable borrowers. In contrast, regulatory gaps or fragmented frameworks may undermine financial resilience by allowing opaque algorithmic practices to persist without meaningful accountability.(Darko B. Vuković; Senanu Dekpo-Adza; Stefana Matovic, 2026)

The discussion also highlights that innovation in AI-driven P2P lending should not be understood solely in terms of efficiency and market expansion. Without adequate ethical and legal safeguards, innovation risks reproducing structural inequalities through automated decision-making processes. Comparative insights demonstrate that regulatory systems integrating ethical principles into AI governance are better positioned to balance technological advancement with social justice objectives.(Hutukka, 2024)

In this context, Islamic values provide a complementary normative framework for evaluating AI regulation in P2P lending. Principles such as justice (al-‘adl), public interest (maslahah), and the avoidance of excessive uncertainty and exploitation (gharar) align closely with contemporary concerns over fairness, transparency, and consumer protection in AI systems. Embedding these values within regulatory discourse strengthens the moral legitimacy of AI governance in the post-digital era.(Shalhoob, 2025)

Comparison Table of AI Regulation Best Practices in Peer-to-Peer Lending

Country/Region	AI Regulation Model	Best Practice	Key Benefits	Challenge
European Union (EU)	Risk-based regulation (EU AI Act)	High-risk AI classification (including credit scoring), transparency obligations, algorithmic audits, human oversight	Strong consumer protection, clear accountability	High, complex compliance burden for small fintechs
United States	Sectoral & principle-based	Non-discrimination enforcement (FCRA, FTC, CFPB), surveillance of AI unfair practices	Flexible, fast innovation	No unified national AI framework
United Kingdom (UK)	Adaptive & collaborative regulation	Regulatory sandbox, regulator–industry dialogue, limited AI	Driving controlled innovation	Dependence on self-regulation

Country/Region	AI Regulation Model	Best Practice	Key Benefits	Challenge
		testing		
Singapore	Ethical & governance-based (FEAT Principles)	Prinsip Fairness, Ethics, Accountability, Transparency; AI governance toolkit	Clear ethical standards, easy to adopt industry	Non-binding
China	State-centric & strict oversight	Regulation of recommendation algorithms, strict state controls, reporting obligations	Strong systemic risk control	The risk of over-regulation and restrictions on innovation
South Korea	Comprehensive AI legislation	AI Basic Act, mandatory risk assessment, digital consumer protection	Comprehensive legal framework	Technical implementation is still developing
Indonesia	Fintech-based regulation (OJK)	P2P lending oversight, consumer protection, data security	Flexible, supporting financial inclusion	No specific AI regulations yet, minimal explainability rules

Source: Results of research

The comparative legal analysis demonstrates that regulatory frameworks governing artificial intelligence in peer-to-peer lending can be broadly classified into three models: risk-based regulation, principle-based regulation, and sectoral or fragmented regulation. Jurisdictions adopting a risk-based approach tend to impose differentiated obligations on AI systems according to their potential impact on consumers and financial stability. This model shows greater capacity to address algorithmic discrimination and systemic risk, although its effectiveness depends heavily on regulatory enforcement and institutional readiness.

The results further indicate that principle-based regulatory systems emphasize flexibility and innovation by relying on general norms such as transparency, accountability, and fairness. While this approach supports technological development in P2P lending platforms, it often lacks concrete mechanisms to ensure explainability and effective redress for consumers affected by automated credit decisions. In contrast, fragmented or sector-specific regulations frequently fail to capture the cross-cutting risks posed by AI, leading to regulatory gaps and uneven levels of consumer protection.

Results and discussion underscore the importance of a holistic and value-oriented regulatory approach to AI in P2P lending. Combining comparative legal insights with interdisciplinary and Islamic perspectives enables the development of resilient, inclusive, and ethically grounded financial innovation in the post-digital era.

The discussion also reveals that innovation in AI-driven P2P lending must be aligned with ethical and social considerations. Comparative insights show that jurisdictions integrating ethical principles into their regulatory frameworks are better positioned to balance efficiency with justice. In this regard, Islamic legal and ethical values—particularly justice (*al-‘adl*),

public interest (maslahah), and the prohibition of exploitative practices—offer a normative foundation that complements contemporary AI governance principles.

Overall, the discussion suggests that a harmonized and value-oriented regulatory approach is essential to ensure that AI innovation in P2P lending enhances financial inclusion while maintaining systemic resilience. Comparative legal perspectives, when combined with interdisciplinary and Islamic ethical insights, offer a robust foundation for developing future-oriented AI regulations capable of addressing global challenges in digital finance. (Ali et al., 2025)

Conclusion

From a resilience perspective, the findings suggest that robust AI governance contributes significantly to the sustainability of digital financial ecosystems. Legal requirements mandating human oversight, auditability of algorithms, and data protection enhance trust and reduce the likelihood of exclusionary lending practices. Conversely, weak or inconsistent regulation increases the risk of opacity and unfair treatment, undermining both financial inclusion and long-term system stability.

Artificial intelligence regulation in peer-to-peer lending is a crucial issue in the post-digital era that is full of innovation and risk. Through a comparative legal approach, this paper shows that an adaptive regulatory framework oriented towards community protection plays an important role in strengthening the resilience of the digital financial system. The integration of Islamic values, such as justice, benefit, and transparency, provides an ethical foundation for the development and oversight of AI so that technological innovation does not create new inequality, but rather promotes sustainable and responsible financial inclusion globally.

References:

- Agustinus Wardi; Galuh Aditya. (2025). Decision-Making : A Case-Based Study of Fintech. *Jurnal Akuntansi dan Bisnis (Akuntansi)*, 5(1), 16–25. <https://doi.org/https://doi.org/10.51903/jiab.v5i1.1044>
- Alasmari, A. A., & Alotaibi, H. A. (2026). Modernizing Commercial Agency Regulations in Saudi Arabia: Legal Reforms and Comparative Insights. *F1000Research*, 14. <https://doi.org/10.12688/f1000research.168970.4>
- Ali, F., Bouzoubaa, K., Gelli, F., & Hamzi, B. (2025). Islamic Ethics and AI : An Evaluation of Existing Approaches to AI using Trusteeship Ethics. *Philosophy & Technology*, 38(3), 1–34. <https://doi.org/10.1007/s13347-025-00922-4>
- Allen, F., Gu, X., & Jagtiani, J. (2021). A Survey of Fintech Research and Policy Discussion. *Review of Corporate Finance*, 1(3–4), 259–339. <https://doi.org/10.1561/114.00000007>
- Arjun Sulaeman. (2025). *Penggunaan Artificial Intelligence untuk Penilaian Kredit oleh Perusahaan Financial Technology Peer to Peer Lending di Indonesia dalam Perspektif Perlindungan Konsumen Skripsi*.
- Darko B. Vuković; Senanu Dekpo-Adza; Stefana Matovic. (2026). AI integration in financial services: a systematic review of trends and regulatory challenges. *Humanities and Social Sciences Communications*, 2025. <https://doi.org/10.1057/s41599-025-04850-8>
- Domenico, D. (2022). Guest editorial : Impact of artificial intelligence on business strategy in emerging markets : a conceptual framework and future research directions. *International Journal of Emerging Markets*, 17(4), 917–929. <https://doi.org/10.1108/IJOEM-04-2022-995>
- Fortune Business Insight reporter. (2026). *Peer-to-Peer Lending Market Size, Share & Industry Analysis, By Type (Consumer Lending and Business Lending), By Loan Security (Secured Loans and Unsecured Loans), By Application (Direct Web Platform, Mobile App Channels,*

- and Aggregator Platform), By End . <https://www.fortunebusinessinsights.com/peer-to-peer-lending-market-114634#:~:text=The North America held the,adoption%2C and mature fintech ecosystem.>
- Hutukka, P. (2024). Fintech law in the European Union , the United States and China : Regulation of fi nancial technology in comparative context. *Maastricht Journal of European and Comparative Law*, 31(5), 559–594. <https://doi.org/10.1177/1023263X241298416>
- ICSeB 2022 - 2022 6th International Conference on Software and e-Business. (2022). *ACM International Conference Proceeding Series*.
- Jameaba, M. (2023). *Digitalization , Emerging Technologies , and Financial Stability : Challenges and Opportunities for the Indonesian Banking Sector and Beyond . Mulyanja Ssenyonga Jameaba. Ic*, 1–39. <https://doi.org/10.32388/CSTTYQ.3>
- Kanojia, S., Singh, A., & Singh, A. K. (2026). Role of Artificial Intelligence in FinTech and Banks: Challenges and Future Research Agenda. In *E-Financial Strategies for Sustainable Development: A Handbook for Promoting Financial Inclusion and Ending Poverty (SDG 1)* (or. 247–273). Apple Academic Press. <https://doi.org/10.1201/9781779640956-13>
- Nguyen, N., & Ngo, V. D. (2021). Digital finance and SMEs in Southeast Asia: An overview. In *Entrepreneurial Finance, Innovation and Development: A Research Companion* (or. 3–24). Taylor and Francis. <https://doi.org/10.4324/9781003134282-2>
- Nurhilmayah, N., Hasim Purba, Zulkarnain Sitompul, T. K. D. A. (2025). Comparison of The Laws Governing Online Loans in England. *Journal of Lifestyle and SDGs Review*, 5, 1–16.
- Ratnasari, A. A. R. T., & Chabibatul Mua’awanah; Raisa Aribatul Hamidah. (2022). Generation Z perceptions in paying Zakat , Infaq , and Sadaqah using Fintech : A comparative study of Indonesia and Malaysia. *Business Perspective*, 19, 2022, 320–330. [https://doi.org/10.21511/imfi.19\(2\).2022.28](https://doi.org/10.21511/imfi.19(2).2022.28)
- Shalhoob, H. (2025). The role of AI in enhancing shariah compliance: Efficiency and transparency in Islamic finance. *Journal of Infrastructure, Policy and Development*, 9(1), 1–26. <https://doi.org/https://doi.org/10.24294/jipd11239>
- Wijaya, B. F. (2026). *Jumlah Peer to Peer Lending Syariah di Indonesia*. <https://desakarangbendo.id/berita-pinjaman-online/430943609/11-pinjol-syariah-resmi-ojk-yang-bebas-riba-dan-terbukti-cepat-cair-2026/>