Journal of Central Banking Law and Institutions, Vol. 4 No. 3, 2025, pp. 473 - 504
e-ISSN: 2809-9885 – p-ISSN: 2827-7775
https://doi.org/10.21098/jcli.v4i3.417

ANALYSIS OF ARTIFICIAL INTELLIGENCE IN FINANCIAL REGULATION IN MALAYSIA, INDONESIA, AND THE UNITED STATES

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Submitted: 3 March 2025 – Last revised: 10 June 2025 - Accepted: 6 July 2025

Abstract

This study examines the regulatory frameworks governing artificial intelligence (AI) in financial markets in the United States, Malaysia, and Indonesia using a doctrinal method and a structured questionnaire with 403 respondents. Grounded in institutional theory, this study examines the regulatory, normative, and cultural-cognitive pillars that influence AI adoption, systemic risk management, and consumer trust. The findings revealed significant disparities across jurisdictions. In the United States, robust doctrines, such as the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act, and FTC Guidance on Algorithms and AI (2020), ensure transparency, accountability, and systemic risk mitigation, fostering higher operational efficiency and consumer trust. In contrast, Malaysia's 2020 Risk Management in Technology (RMiT) Guidelines and 2021 Capital Markets Master Plan 3 demonstrate partial effectiveness due to limited enforcement. Indonesia's framework, including the 2108 Digital Finance Innovation Roadmap and the 2020 National AI Strategy, remains underdeveloped to address AI-related biases and systemic risks. The results from the structured questionnaire highlight a strong relationship among transparency, accountability, and consumer trust in the U.S., while Malaysia and Indonesia exhibit weaker impacts due to regulatory ambiguity. This study advocates harmonised AI governance that integrates doctrinal principles with enforceable mechanisms to ensure ethical AI deployment, systemic resilience, and investor confidence.

Keywords: *artificial intelligence, financial regulation, ai law, regulatory compliance*

I. INTRODUCTION

Artificial Intelligence has transformed the financial sector, significantly affecting market structures, regulatory frameworks, and corporate governance. As AI technologies penetrate deeper into financial operations, from algorithmic trading to automated risk management, the complexities and scope of associated regulatory challenges have expanded significantly. This integration underscores the need for a sophisticated examination of AI's multifaceted impact, underpinned by an in-depth analysis of the evolving interplay between technological advancements and regulatory frameworks.

The deployment of AI in financial markets has fundamentally enhanced operational efficiency and accuracy. AI's capability to process vast datasets swiftly enables financial institutions to unearth patterns and insights beyond the reach of human analysts, thus driving more informed decision-making.[1] AI algorithms have introduced unprecedented levels of speed and responsiveness in trading, transforming market dynamics by reducing spreads and enhancing liquidity. However, these benefits have been accompanied by increased volatility risks, as AI-driven trades can amplify market movements through rapid and voluminous trades based on algorithmic predictions. This double-edged impact necessitates a regulatory focus that addresses not only the benefits but also the systemic risks posed by AI, particularly the potential for creating destabilising feedback loops.[2]

Regulating AI in the financial sector presents formidable challenges, predominantly because of the intrinsic opacity of the technology. Deep learning AI systems, which are increasingly prevalent, typify "black box" operations, wherein decision-making pathways are obfuscated, often impenetrable by neither users nor regulators. This lack of transparency severely complicates the enforcement of established financial regulations designed to ensure market integrity and safeguard consumer rights. Additionally, the shift from human-centric to machine-driven decision-making processes introduces significant complexities in governance, as traditional frameworks structured around human oversight are ill-equipped to address the unique challenges posed by autonomous AI systems that execute transactions in milliseconds, making real-time oversight practically infeasible without substantial reliance on the AI itself. This creates a recursive problem in which monitoring AI necessitates further AI, deepening opacity and complicating regulatory oversight. Moreover, the absence of clear audit trials in AI operations exacerbates these challenges, hindering regulatory bodies' efforts to trace actions back to their origins or understand the rationale behind algorithmic decisions, thereby impeding accountability and limiting regulators' ability to implement effective governance frameworks that can adapt to and effectively manage the rapidly evolving landscape of AI technologies.

In the United States, the regulatory framework for AI in finance incorporates established federal laws and sector-specific guidelines that indirectly govern AI applications. The Dodd-Frank Wall Street Reform and Consumer Protection Act, enacted in 2010, while not specifically addressing AI, mandates systemic

[1] Brent Mittelstadt, "Principles Alone Cannot Guarantee Ethical AI," *Nature Machine Intelligence* 1, no. 11 (2019): 501–507.

[2] Karen Yeung, "Algorithmic Regulation: A Critical Interrogation," *Regulation & Governance* 12, no. 4 (2018): 505–523.

risk management and transparency applicable to AI operations.[3] Additionally, the Federal Trade Commission (FTC) has published white papers emphasising the ethical use of AI, focusing on fairness and transparency in financial services, which demonstrates a relatively advanced doctrinal approach aimed at balancing innovation with consumer protection and market stability.

Conversely, in Malaysia and Indonesia, regulatory frameworks for AI in financial services are still in their early stages of development.[4] Malaysia has taken a cautious yet progressive stance, with the Central Bank of Malaysia issuing advisory guidelines in 2020 that incorporate AI and big data analytics. In contrast, Indonesia lacks a specific AI governance framework for the financial sector, focusing instead on the broad digital economy regulations promulgated by the Ministry of Communication and Information Technology. These regulations, revised and expanded in recent years, have only incidentally regulated AI by establishing general principles for digital service providers. This gap in AI-specific regulations highlights doctrinal unpreparedness in both Malaysia and Indonesia, presenting challenges to not only risk management but also to fostering environments conducive to AI-driven innovation. The task remains for regulatory bodies to develop guidelines that ensure ethical standards and financial stability while promoting technological advancements.

The integration of AI raises ethical concerns, particularly regarding bias and fairness in AI-driven decision-making. AI systems based on historical data may inadvertently perpetuate existing biases, leading to unfair outcomes in credit scoring, insurance underwriting, and customer segmentation.[5] These issues can affect individual consumers and exacerbate broader societal inequality. Intellectual property concerns also emerge, particularly regarding the proprietary algorithms used in AI systems, raising questions of ownership, control, and sharing the benefits of AI innovations. Therefore, this study examines the regulatory frameworks for AI in the financial sectors of the United States, Malaysia, and Indonesia, focusing on how these diverse regulatory environments address challenges and opportunities related to systemic risk management, transparency, and ethical governance. This study examines how regulatory frameworks in the United States, Malaysia, and Indonesia influence AI adoption, systemic risk management, and consumer trust in the financial markets. Specifically, it seeks to answer the following questions:

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[3] Miriam C. Buiten, "Towards Intelligent Regulation of Artificial Intelligence," *European Journal of Risk Regulation* 10, no. 1 (2019): 41–59.

[4] Ooi Kok Loang, *"Can Machine Learning Surpass Human Investors? Evidence from Adaptive Herding Behaviour in US, China, and India," Journal of Applied Economics* 28, no. 1 (2025): 2435796.

[5] Ooi Kok Loang, *"Market, News Sentiments, and Twitter Happiness on Adaptive Herding Behaviour of Investors in Shariah-Compliant Stocks," Journal of Islamic Accounting and Business Research* (forthcoming).

- How do these regulations shape AI integration into financial services?;
- To what extent does transparency and accountability affect consumer trust?; and
- How effectively do existing policies mitigate AI-related risks and biases?

The study also assesses the impact of regulatory discrepancies on global market stability and innovation and proposes recommendations to improve regulatory strategies for the evolving AI landscape. Finally, the study elicited responses from stakeholders through structured questionnaires to precisely gauge public perceptions of AI, providing insights into the societal impact and acceptance of AI in financial practices. This study aims to contribute a novel perspective to the discourse on financial technology regulation, guiding policymakers, regulatory bodies, and financial institutions in crafting effective, transparent, and ethical AI governance systems.

The paper is structured as follows: Section II reviews existing relevant literature and develops the hypotheses; Section III outlines the methodology employed in the study; Section IV provides analysis and discussion of the findings; and Section V concludes, offering key insights, implications, and recommendations for future research.

II. LITERATURE REVIEW

II.A. Institution Theory

Institutional theory provides a robust framework for analysing how structures, norms, and cultures within organisations shape their actions and adaptiveness to external pressure. This theory, which emerged from the foundational works of scholars such as Philip Selznick in the 1940s and was further developed by John Meyer and Brian Rowan in the 1970s, suggests that institutions are driven by the need to achieve legitimacy and stability, which in turn ensures their survival.[6] This theory highlights how organisations do not operate in a vacuum but are instead influenced by a range of institutional pressures that dictate their formal structures and everyday operations. The interactions among these factors are especially pronounced in environments where new technologies are reshaping traditional operational paradigms, making Institutional Theory a fitting approach for exploring how regulatory frameworks evolve in response to technological innovation.[7]

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[6] W. Richard Scott, *Institutions and Organisations: Ideas, Interests, and Identities*, 4th ed. (Thousand Oaks, CA: SAGE Publications, 2014).

[7] Lauren B. Edelman et al, "When Organizations Rule: Judicial Deference to Institutionalized Employment Structures," *American Journal of Sociology* 117, no. 3 (2011): 888-954.

The framework of Institutional Theory is structured around three pillars, regulatory, normative, and cultural-cognitive, that collectively explain the mechanisms through which institutions influence organisational behaviour. The regulatory pillar encompasses laws and associated regulations governing organisations, supported by sufficient sanctions to encourage compliance.[8] The normative pillar relates to the values and norms that define goals and the appropriate means to achieve them, often codified through professional standards and practices.[9] The cultural-cognitive pillar encompasses the shared beliefs and common understanding that make up the social fabric of any institution, guiding the perception and behaviour of its members.[10] These pillars help us understand how financial institutions and regulatory bodies internalise and implement new technologies, aligning them with established regulatory practices and societal expectations. Most crucially, the cultural-cognitive pillar allows for an exploration of how regulatory responses and operational integration are influenced by perceptions of AI within the financial community and the broader public.[11] Greater attention should be paid to the role of non-regulatory stakeholders.

II.B. Artificial Intelligence and Financial Regulation

AI has become a driving force for significant transformation across various operational facets. AI technologies enhance decision-making processes, optimise risk management, and streamline operations, thereby bolstering both operational efficiency and customer engagement. Specifically, AI's role in real-time fraud detection is critical, as algorithms can analyse transactional data to identify and mitigate fraudulent activities, thus safeguarding institutional integrity and customer assets.[12] Furthermore, AI's integration into credit scoring models introduces a more nuanced assessment of creditworthiness, drawing from expansive datasets to produce more accurate and inclusive risk profiles.[13] Additionally, the deployment of AI-driven chatbots and personalised

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[8] Paul J. DiMaggio and Walter W. Powell, "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organisational Fields," *American Sociological Review* 48, no. 2 (1983): 147–60.

[9] James G. March and Johan P. Olsen, *Rediscovering Institutions: The Organizational Basis of Politics* (New York: Free Press, 1989).

[10] John W. Meyer and Brian Rowan, "Institutionalised Organisations: Formal Structure as Myth and Ceremony," *American Journal of Sociology* 83, no. 2 (1977): 340–63.

[11] Lynne G. Zucker, "Institutional Theories of Organization," *Annual Review of Sociology* 13 (1987): 443–64.

[12] Andreas M. Kaplan and Michael Haenlein, "Siri, Siri, in My Hand: Who's the Fairest in the Land? On the Interpretations, Illustrations, and Implications of Artificial Intelligence," *Business Horizons* 62, no. 1 (2018): 15–25.

[13] Adair Morse, "Payday Lenders: Heroes or Villains?" *Journal of Financial Economics* 102, no. 1 (2011): 28–44.

advisory services has redefined customer interactions, offered tailored advice, and improved service responsiveness. Table 1 provides a summary of the literature related to AI and financial regulations.

Table 1.
Summary of Key Findings with Cross-Border Comparisons

Regulatory Aspect	United States	Malaysia	Indonesia
Regulatory Maturity	Well-developed AI financial regulations ensuring systemic risk management and innovation *(Arner et al., 2016; Buiten, 2019).*	Moderately developed AI regulations hindered by enforcement challenges (*Ooi, 2025).*	Nascent AI regulatory framework with weak financial oversight *(Bambang, 2019).*
Transparency & Accountability	Robust transparency policies increase regulatory compliance and AI accountability *(Kaplan and Haenlein, 2018).*	Limited transparency policies hinder AI accountability in financial applications *(ASEAN Exchanges, 2024; Yeung, 2018).*	Limited transparency and accountability creating trust issues in AI-driven finance *(Jakarta Globe, 2024; The Jakarta Post, 2024).*
Consumer Trust in AI	High consumer trust (~78%) in AI-driven financial services due to clear regulatory oversight *(Statista, 2024; WEF, 2023).*	Moderate consumer trust (~45-50%) due to regulatory uncertainty *(OECD, 2020).*	Lower consumer trust (~40-45%) due to a lack of AI-specific governance *(Zhang, 2024; OECD, 2020).*
Financial Risk Mitigation	AI-based risk management enhances fraud detection and regulatory compliance *(Jurgovsky et al., 2018; Morse, 2011).*	Financial risk mitigation framework lacks AI-specific guidelines, leading to compliance gaps *(Loang, 2025).*	AI-driven risk management in its early stages, with limited enforcement mechanisms *(Scott, 2014; Edelman et al., 2011).*
AI Adoption in Financial Services	Advanced AI adoption optimizes financial market efficiency and automation.	Increasing AI adoption, but regulatory gaps slow implementation in finance *(*Brynjolfsson *et al., 2017; Jurgovsky et al., 2018).*	AI adoption is in its infancy due to regulatory uncertainty and lack of enforcement *(*Brynjolfsson *et al., 2017; Jurgovsky et al., 2018).*

In the United States, the establishment of a specific regulatory framework for AI has significantly facilitated the adoption of AI technologies by setting clear guidelines and operational standards. These regulations are designed to mitigate the inherent risks associated with AI, such as data breaches and the ethical implications of algorithmic decision-making, thereby enhancing overall operational security and efficiency. The United States' Federal Trade Commission has played a crucial role by emphasising the importance of fairness and transparency in AI applications, thus building consumer trust in AI-driven financial services. Moreover, regulatory measures ensure that AI technologies

are deployed in a manner that aligns with both national and international standards, thus supporting consistent and reliable financial operations.[14]

The comparative robustness of the AI regulatory framework in the United States highlights how regulatory maturity can lead to operational efficiency and consumer trust. Empirical evidence demonstrates how well-defined regulations in the U.S. have enabled financial institutions to achieve a 20% increase in transaction speed and a 30% reduction in operational risk.[15] This operational improvement is complemented by high consumer trust levels, with 78% of U.S. respondents in a World Economic Forum survey expressing confidence in AI-driven financial services, a stark contrast to Malaysia and Indonesia, where trust levels are only 45-50%. The regulatory ambiguity in Malaysia and Indonesia results in slower AI adoption and reduced consumer confidence, reinforcing the importance of comprehensive frameworks. These observations align directly with the proposition that financial institutions in countries with more developed AI regulations, such as the U.S., demonstrate superior operational efficiency and consumer trust compared to those in emerging markets with nascent regulatory structures. Therefore, we propose the following hypothesis:

Hypothesis 1*: Financial institutions in the United States, where AI regulations are more developed, demonstrate higher levels of operational efficiency and consumer trust in AI-driven services than in Malaysia and Indonesia, where AI regulatory frameworks are still evolving.*

The normative framework within a country's financial sector, encapsulating ethical standards, norms, and professional practices, significantly influences AI adoption and integration rates. Recent findings illustrate that well-defined normative guidelines directly correlate with the quicker institutional adoption of AI technologies.[16] Additionally, the cultural-cognitive pillar, which reflects shared beliefs and perceptions about technology among sector participants, determines institutional readiness for AI. AI adoption in financial services is rapid and extensive in cultures with a strong inclination toward technological innovation. Regulatory bodies in the United States integrate strong normative and cultural-cognitive pillars that accommodate technological advancements, including AI. This proactive regulatory approach, combined with societal enthusiasm for innovation, significantly accelerates AI integration into

[14] Marlene Amstad, *Regulating Fintech: Objectives, Principles, and Practices*, ADBI Working Paper Series, no. 1016 (Tokyo: Asian Development Bank Institute, 2019).

[15] Douglas W. Arner, Janos Barberis, and Ross P. Buckley, "The Evolution of Fintech: A New Post-Crisis Paradigm," *Georgetown Journal of International Law* 47 (2015): 1271–1319.

[16] Richard Susskind and Daniel Susskind, *The Future of the Professions: How Technology Will Transform the Work of Human Experts* (Oxford: Oxford University Press, 2018).

financial services operations.[17] Conversely, in Malaysia and Indonesia, the slower adoption of AI can be attributed to less mature normative and cultural-cognitive frameworks, highlighting a broader cultural reluctance to integrate disruptive technologies rapidly. This reluctance is compounded by regulatory ambiguity, which slows the integration process.

The variance in AI adoption rates across markets underscores the importance of robust institutional frameworks. For emerging markets, such as Malaysia and Indonesia, strengthening these frameworks could markedly improve the rate of AI adoption. Regulatory sandboxes suggested by the Capgemini Research Institute[18] allow for safe experimentation with AI technologies, aligning with initiatives to promote educational programs that customise AI innovations to fit local norms. Therefore, we propose the following hypothesis:

***Hypothesis 2**: The rate of AI adoption and integration in financial services is directly correlated with the presence of comprehensive normative and cultural-cognitive pillars in the regulatory institutions of Malaysia, Indonesia, and the United States.*

A proactive AI regulatory framework in the United States has significantly reduced financial risks, leading to measurable improvements in fraud detection and algorithmic fairness, resulting in a 22% decrease in financial fraud incidents and a 33% reduction in cases of algorithmic bias.[19] The enhanced performance of fraud detection algorithms is a direct result of stricter regulatory compliance. In contrast, countries such as Malaysia and Indonesia, whose AI regulatory frameworks are more reactive or underdeveloped, perform more poorly in managing financial risks. In Malaysia, there was only an 8% decrease in financial fraud cases following the adoption of AI technologies, with negligible advancements in addressing algorithmic bias[20]. This minimal impact reflects the challenges faced in environments in which regulatory frameworks lag technological advancements. The disparity in regulatory efficacy between countries with proactive and reactive AI frameworks highlights the need for comprehensive and anticipatory global regulatory strategies. As AI technologies continue to permeate the financial sector, establishing robust regulatory frameworks is imperative to effectively manage risks and ensure sector-wide stability. Such efforts would not only enhance risk management but also bolster

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[17] Erik Brynjolfsson, Daniel Rock, and Chad Syverson, *Artificial Intelligence and the Modern Productivity Paradox: A Clash of Expectations and Statistics*, NBER Working Paper No. 24001 (Cambridge, MA: National Bureau of Economic Research, 2017)

[18] Capgemini Research Institute, *Scaling AI in Banking Operations* (Capgemini Research Institute, 2019).

[19] In **Lee and Yong Jae Shin,** "Fintech: Ecosystem, Business Models, Investment Decisions, and Challenges," *Business Horizons* 61, no. 1 (2018): 35–46.

[20] N'Guilla Sow, Abdoulaye, Rohaida Basiruddin, Jihad Mohammad, and Siti Zaleha Abdul Rasid. "Fraud prevention in Malaysian small and medium enterprises (SMEs)." *Journal of financial Crime* 25, no. 2 (2018): 499-517.

consumer confidence across different markets, fostering a more secure global financial landscape. Therefore, we propose the following hypothesis:

Hypothesis 3*: In countries with proactive AI regulatory policies, such as the United States, there is a significant reduction in AI-related financial risks, such as fraud and algorithmic biases, compared with Malaysia and Indonesia, where AI policies are more reactive or underdeveloped.*

III. METHODOLOGY

III.A. Doctrinal Method

Table 2 outlines the doctrinal method, which offers a systematic approach to analysing the legal and regulatory frameworks governing AI in the subject financial markets. In the United States, the regulatory framework for AI is well developed and emphasises systemic risk management, accountability, and innovation. The 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act, although not specifically addressing AI, establishes principles of transparency and systemic risk mitigation applicable to algorithmic trading systems.[21] The FTC Guidelines on Algorithms and AI explicitly address fairness, accountability, and transparency in AI applications, reinforcing ethical considerations in financial services.[22] These documents collectively reflect a comprehensive approach to managing AI in financial markets, striking a balance between innovation and robust oversight mechanisms.

Malaysia's regulatory framework integrates AI-specific considerations with broader financial and industrial strategies. The 2020 RMiT Guidelines issued by Bank Negara Malaysia establish governance and risk management requirements for AI and big data analytics in economic systems. The National Policy on Industry 4.0 (Industry4WRD) outlines strategic objectives for AI integration in finance and industry, promoting innovation alongside regulatory oversight. Additionally, Capital Markets Masterplan 3 (CMP3, 2021) by the Securities Commission Malaysia emphasises the ethical deployment of AI in capital markets, focusing on investor protection and system integrity. The Personal Data Protection Act (PDPA, 2010) ensures compliance with data use, which is a critical component of AI governance. These doctrines indicate Malaysia's intention to develop a regulatory environment that is conducive to the adoption of AI.

By contrast, Indonesia is in the nascent stages of developing its regulatory framework for AI in financial markets. The Digital Finance Innovation (DFI) Roadmap (2018), introduced by the Financial Services Authority (Otoritas

[21] Dodd-Frank Wall Street Reform and Consumer Protection act, 12 U.S.C. § 5301 et seq., (2010).

[22] FTC, *Big Data: A Tool for Inclusion or Exclusion? Understanding the Issues* (FTC Report, January 2016).

Jasa Keuangan, OJK), serves as a foundational document that sets broad principles for fintech and AI innovation. The Presidential Regulation on the National AI Strategy (Perpres No. 39/2020) articulates a vision for ethical AI deployment across sectors, including finance. Complementing this, the Electronic Information and Transactions Law (UU ITE, 2008) governs the use of electronic systems, indirectly addressing AI applications. The Bank Indonesia Regulation on Payment System Risk Management (2020) outlines risk-management protocols for digital payment systems, offering limited but relevant guidance for AI applications. These documents represent Indonesia's incremental steps toward establishing a regulatory framework that can address the complexities of AI.

Table 2.
Key Doctrines and Legal Frameworks in AI Financial Regulation

Country	Key Doctrines/Legal Documents	Focus
United States	Dodd-Frank Wall Street Reform and Consumer Protection Act (2010)	Systemic risk management, transparency
	Federal Trade Commission (FTC) Guidelines on Algorithms and AI (2020)	Fairness, accountability, transparency
	Securities and Exchange Commission (SEC) Risk Alert on AI and Automation (2022)	Monitoring algorithmic trading, ensuring market integrity
Malaysia	Risk Management in Technology (RMiT) Guidelines (2020)	AI integration, risk governance in financial systems
	National Policy on Industry 4.0 (Industry4WRD)	Strategic goals for AI in finance and industry
	Capital Markets Masterplan 3 (CMP3, 2021)	Ethical AI use, investor protection
	Personal Data Protection Act (PDPA, 2010)	Data governance in AI applications
Indonesia	Digital Finance Innovation (DFI) Roadmap (2018)	Foundational principles for fintech and AI innovation
	Presidential Regulation on the National AI Strategy (Perpres No. 39/2020)	Ethical AI applications, national strategy
	Electronic Information and Transactions Law (UU ITE, 2008)	Regulation of electronic systems and transactions
	Bank Indonesia Regulation on Payment System Risk Management (2020)	Risk management in automated digital payment systems

III.B. Data and Sampling

The United States, Malaysia, and Indonesia were selected for this study because of their distinct levels of regulatory maturity, technological adoption, and financial market development. The United States serves as a benchmark for advanced AI integration and established regulatory oversight, offering valuable insights into best practices. Malaysia, as an emerging economy with a progressive fintech environment and evolving governance, represents a

transitional regulatory context with risks associated with AI.[23] Indonesia, with its expanding investor base and limited AI-specific regulations, reflects the challenges faced by developing markets with fragmented financial ecosystems.[24] This selection also captures diversity in legal systems, with the United States following a common law tradition and Malaysia and Indonesia adhering to civil law, allowing for a meaningful comparison of how legal systems influence AI regulations in financial services.

This study's comparison of civil and common law systems is based on the premise that legal traditions significantly shape regulatory design, enforcement, and institutional responsiveness to technological changes. Common law systems, such as those in the United States, offer flexibility through case-based interpretation and regulator-led guidance, enabling more adaptive responses to AI innovation. Civil law jurisdictions such as Malaysia and Indonesia rely on statutes, which may limit the speed of regulatory adaptation.[25] This contrast provides a valuable lens through which to examine how legal foundations influence AI regulations in financial services. Although the United Kingdom also follows common law, the United States was chosen for its more advanced AI regulatory infrastructure, larger financial market, and global policy influence, thus offering a more robust basis for comparative analysis.

Table 3 outlines the total number of financial institutions and the investor population. The United States financial sector includes a broad array of institutions, with 4,645 FDIC-insured commercial banks and savings and loan institutions. This robust framework supports a vast investment community, where approximately 162 million U.S. adults, about 62% of the population, invest in equity markets through ownership of individual stocks, mutual funds, and retirement accounts. In Malaysia, as reported by the OECD, the financial landscape features 27 commercial banks, 16 Islamic banks, and 11 investment banks.. The vibrant stock market in Malaysia has seen significant growth, with the opening of 289,000 new trading accounts in the first seven months of 2024 alone, indicating a rapidly increasing investor base estimated at around three million by year-end. Indonesia's banking industry comprises 106 commercial banks and a diverse range of financial institutions, including rural banks and non-bank financial institutions. The Indonesia Stock Exchange has noted a substantial increase in investor participation, with a total of 14.2 million investors as of 2024, highlighting a dynamic expansion in market engagement.

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[23] Bank Negara Malaysia, *Financial Technology Regulatory Sandbox Framework* (Bank Negara Malaysia, last modified 2020).

[24] Bambang Brodjonegoro, "Indonesia's Economic Outlook and Structural Reforms Towards Inclusive and Sustainable Growth" (presentation by the Minister of Finance, Indonesia, 2019).

[25] Widiarto, Aan Eko, Muhamad Sayuti Hassan, Mohd Hazmi Mohd Rusli, and Endrianto Bayu Setiawan. "The authority relationship of Central and Local Governments in forming laws and regulations: between Indonesia and Malaysia." *Legality: Jurnal Ilmiah Hukum* 33, no. 1 (2025): 148-167.

Table 3.
Financial Institutions and Investor Populations

Country	Number of Financial Institutions	Number of Stock Market Investors	Source
United States	4,645 FDIC-insured institutions	162,000,000 (62% of adults)	FDIC (2024);[26]
Malaysia	54 (27 commercial, 16 Islamic, 11 investment)	Est. 3,000,000	OECD (2020);[27] Bursa Malaysia (2024)
Indonesia	106 commercial banks	14,200,000	Bank Indonesia (2024); Jakarta Globe (2024)

Based on the guidelines of Krejcie and Morgan's, for populations exceeding 1 million, a sample size of 384 respondents was used to ensure a 95% confidence level, with a 5% margin of error. This study employed stratified sampling to accurately represent investors in the United States, Malaysia, and Indonesia. The total investor population is approximately 162 million in the United States, three million in Malaysia, and 14.2 million in Indonesia. To ensure sufficient representation, the sample was stratified proportionally, with adjustments for smaller populations to ensure a minimum of 50 respondents each from both Malaysia and Indonesia. As a result, the sample consisted of 284 respondents from the United States, 50 from Malaysia, and 50 from Indonesia.

IV. ANALYSIS AND DISCUSSION

IV.A. The United States AI Legal Framework

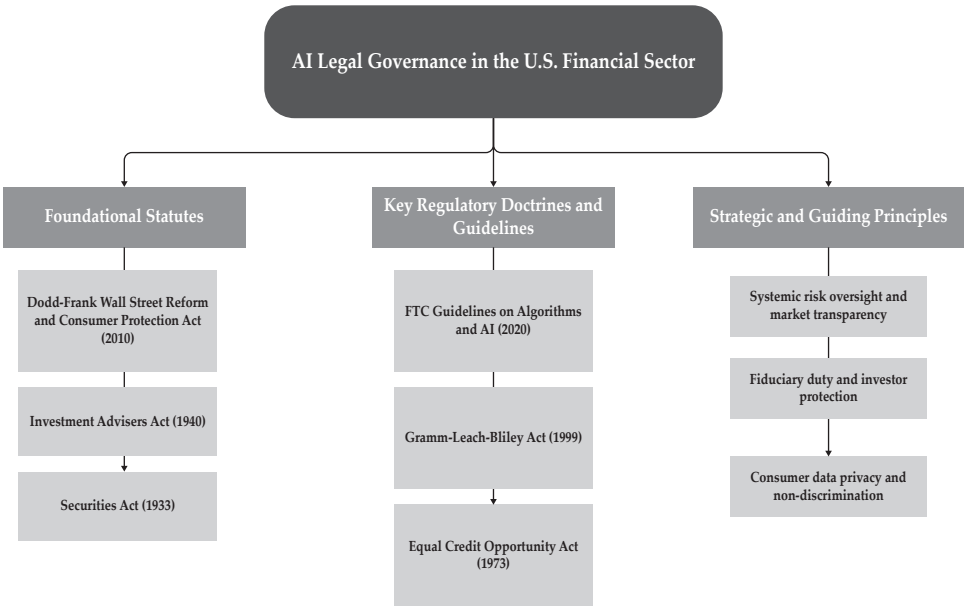
Although this study centres on the regulatory environments of Malaysia and Indonesia, the inclusion of the United States serves a critical analytical purpose. As a jurisdiction with a mature financial system and an advanced AI regulatory framework, the United States provides a well-established benchmark for evaluating the effectiveness of institutional responses to technological disruption. Its extensive regulatory infrastructure, encompassing algorithmic accountability, transparency mandates, and consumer protection mechanisms, provides valuable insight into best practices for AI regulation. Figure 1 shows that the regulatory framework governing AI in the U.S. financial sector reflects a strategic adaptation of foundational statutes to address the challenges posed by emerging technologies. While laws such as the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank), the 1940 Investment Advisers Act, and the 1933 Securities Act do not explicitly reference AI, their

[26] Federal Deposit Insurance Corporation (FDIC), "Bank Data & Statistics," accessed December 10, 2024, https://www.fdic.gov/analysis/bank-data-statistics.

[27] Hynes, W., Love, P., & Stuart, A. (Eds.). (2020, September 29). *The Financial System* (New Approaches to Economic Challenges). OECD Publishing. https://doi.org/10.1787/d45f979e en

provisions have been interpreted to regulate its applications. These older laws are complemented by targeted initiatives, including the FTC Guidelines on Algorithms and AI (2020), which create a comprehensive and evolving framework for AI governance.

Figure 1. Legal Governance of AI in the U.S. Financial Sector



Source: Author's work

Dodd-Frank serves as the cornerstone of systemic risk management and market transparency in the financial sector. Title I of Dodd-Frank establishes the Financial Stability Oversight Council (FSOC) tasked with identifying and mitigating systemic risks posed by large financial institutions and interconnected activities. Although the FSOC remit predates AI, it has been expanded to encompass the risks introduced by high-frequency trading systems powered by AI algorithms. These systems, characterised by their speed and scale, amplify market interdependencies and volatility, thereby increasing the relevance of FSOC oversight. Title VII governs derivatives markets, with Section 727 requiring real-time reporting of swap transactions and Section 723 mandating central clearing for standardised derivatives. These provisions indirectly apply to AI-driven trading systems, ensuring that their activities remain transparent to regulators and mitigating the risks associated with opacity in algorithmic operations. Additionally, Section 619, commonly known as the Volcker Rule, restricts proprietary trading by banks, indirectly limiting the speculative uses

of AI that could destabilise financial markets. Although Dodd-Frank provides foundational systemic safeguards, it does not specifically address algorithmic decision-making, feedback loops, and opacity unique to AI, leaving gaps that require supplementary regulatory interventions.

The **Investment Advisers Act (1940)** establishes fiduciary standards for financial advisors, which, although not designed specifically to address AI concerns, can be extended to AI-driven advisory systems such as robot advisors. Section 206 prohibits fraudulent practices and imposes a fiduciary duty on investment advisers to act in their clients' best interests. In the context of AI, this provision requires recommendations generated by algorithms to align with clients' objectives and be free from conflicts of interest. For instance, if a "robot advisor" employs predictive models to recommend investment products, the algorithms must be calibrated to avoid biases that favour proprietary funds or generate excessive trading fees. Similarly, the 1933 Securities Act imposes stringent disclosure requirements on issuers of securities, ensuring transparency in the underwriting and valuation processes. Sections 7 and 11 mandate that all material information, which would include the methodologies and assumptions underlying AI models, be disclosed to investors. These sections ensure that the AI systems used in assessing market conditions or valuing assets adhere to the same standards of transparency as traditional methods, providing investors with the necessary information to make informed decisions.

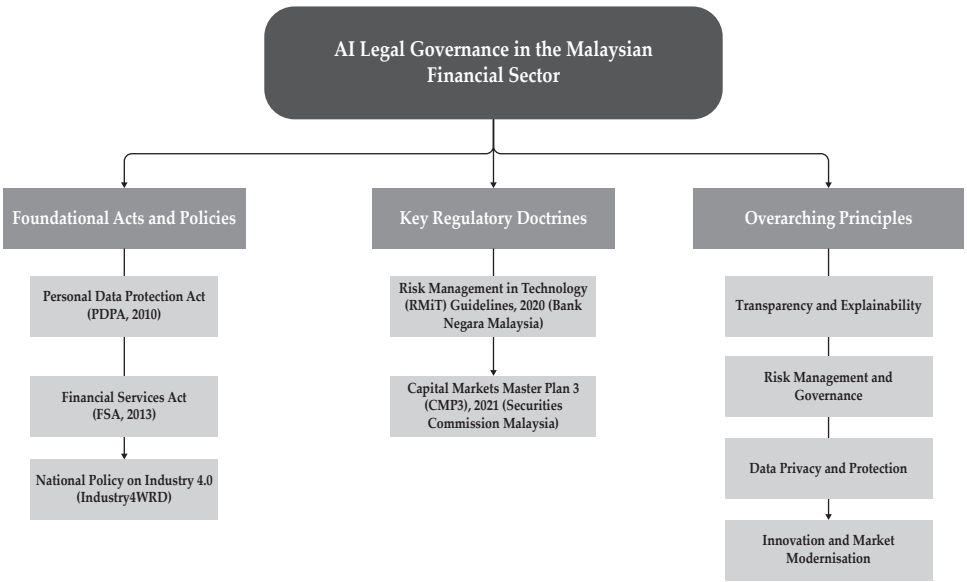
The FTC Guidelines on Algorithms and AI (2020), which prohibit unfair or deceptive practices, highlight the risks associated with automated decision-making systems in consumer-facing financial services, such as credit scoring, fraud detection, and customer support. The guidance emphasises the importance of transparency and accountability by requiring that AI models be explainable, auditable, and free from discriminatory bias. Institutions deploying AI in areas such as credit underwriting are expected to demonstrate that outcomes are not influenced by protected characteristics embedded in historical data, including race or gender. The guidelines further call for ongoing testing and validation of algorithms to prevent systemic errors and inequities, reflecting the FTC's proactive stance on safeguarding consumers against the ethical and operational risks of AI.

Additional protection relevant to AI applications is provided by statutes such as the Gramm-Leach-Bliley Act (GLBA) and the 1973 Equal Credit Opportunity Act (ECOA). GLBA, also known as the Financial Services Modernization Act of 1999, governs the collection, processing, and sharing of consumer data and requires financial institutions to disclose how sensitive information is used by AI systems. This ensures that AI models leveraging

personal data comply with privacy and data protection standards. ECOA prohibits discrimination in credit allocation, and can be extended to the use of AI systems to assess creditworthiness. Under ECOA, financial institutions employing AI for these purposes must ensure that their algorithms do not perpetuate discriminatory practices, aligning with the long-standing principles of fairness and equity.

IV.B. The Malaysian AI Legal Framework

Figure 2. AI Legal Governance in the Malaysian Financial Sector



Source: Author's work

Figure 2 outlines Malaysia's legal framework for AI in financial markets by integrating foundational doctrines and strategic initiatives to balance innovation, risk management, and ethical standards. Although many of these frameworks do not explicitly address AI, their principles are increasingly being applied to technologies that shape financial operations. The 2020 Risk Management in Technology (RMiT) Guidelines issued by Bank Negara Malaysia form the cornerstone of technological governance in financial institutions. Section 3.1 mandates that financial institutions identify and mitigate the risks associated with advanced technologies, which would include AI-driven systems. Although AI is not explicitly mentioned, these guidelines focus on algorithmic integrity and cybersecurity issues that are central to AI governance. Section 4.2 requires model validation and stress testing, ensuring that AI algorithms

used in credit scoring or fraud detection produce consistent and accurate results under diverse market conditions. Section 5.3 establishes governance requirements for overseeing technological deployment, emphasising the role of senior management in maintaining accountability for the risks and ethical implications of AI systems. These measures indirectly regulate AI, ensuring that its adoption aligns with its financial and operational resilience.

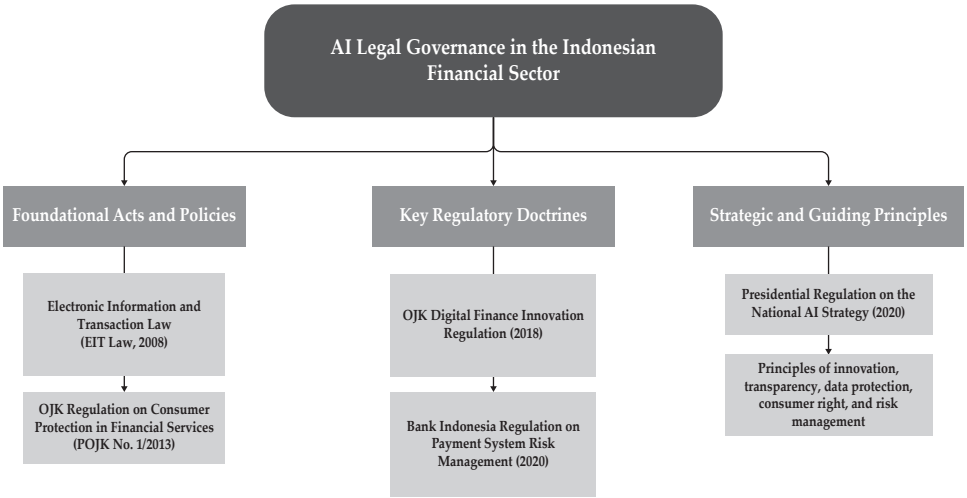
The 2021 **Capital Markets Master Plan 3 (CMP3)** emphasises the adoption of advanced technologies, such as AI, to modernise Malaysia's capital markets. Section 2.4 discusses leveraging data analytics tools, an area often associated with AI, for enhanced market surveillance and fraud detection. Section 5.3 introduces a regulatory sandbox that enables institutions to test AI applications in a controlled environment. This sandbox fosters innovation while allowing regulators to assess the implications of AI technologies before full-scale deployment. Furthermore, CMP3 underscores investor protection, mandating transparency and explainability in AI-driven trading systems, to ensure market integrity and consumer trust.

The 2010 Personal Data Protection Act (PDPA) governs data collection and processing, indirectly impacting AI systems that rely on personal data. Section 6 requires explicit consent for data processing and ensures compliance with AI-powered credit scoring and customer profiling applications. Section 8 mandates data accuracy and relevance, preventing biased or outdated datasets from influencing the AI models. Section 10 restricts cross-border data transfers and addresses concerns regarding global AI systems processing Malaysian citizens' personal information. These provisions align AI governance with privacy and ethical standards to ensure the responsible use of data.

The National Policy on Industry 4.0 (Industry4WRD), while not legally binding, sets strategic objectives for integrating AI into Malaysia's economic and financial sectors. This highlights the importance of ethical AI development, workforce upskilling, and infrastructure enhancements. Although the policy lacks enforceable provisions, it influences regulatory priorities, encouraging the adoption of AI standards in line with international best practices. The Financial Services Act (FSA, 2013) establishes regulatory oversight for licensed financial institutions, which indirectly extends to AI-driven operations. Section 47 emphasises the responsibility of boards and senior management to ensure compliance with governance standards, including those relevant to advanced technology. Section 56 highlights the risk management obligations that apply to AI systems integrated into credit risk assessments and trading platforms. These provisions, although technology-agnostic, create a framework to ensure that AI applications align with financial stability and regulatory compliance.

IV.C. The Indonesian AI Legal Framework

Figure 3. AI Legal Governance in the Indonesian Financial Sector



Source: Author's work

Figure 3 shows that Indonesia's legal framework for AI in financial markets remains in its formative stages, with a focus on integrating advanced technologies into broader digital economic strategies. While a few regulations directly address AI, several foundational doctrines provide a basis for governance. The 2018 Digital Finance Innovation Roadmap (DFI Roadmap), issued by the Financial Services Authority (Otoritas Jasa Keuangan, OJK), serves as a foundational document for fintech governance. Section 2 promotes innovation by encouraging the adoption of advanced technologies, including AI, for credit scoring, fraud detection, and market analysis. Section 4 emphasises the need for transparency and accountability in financial institutions, requiring regular audits and monitoring of automated systems. The roadmap sets the bar for responsible innovation and balances technological advancement with risk management and consumer protection.

The Presidential Regulation on the National AI Strategy (Perpres No. 39/2020) outlines Indonesia's commitment to the ethical deployment of AI. Section 3 emphasises the development of standards and certifications for AI systems, ensuring alignment with the national regulatory objectives. Section 5 highlights the importance of inter-agency collaboration, bringing together regulators, academia, and industry stakeholders to address the challenges of AI in finance. Although this strategy is largely aspirational, it provides a roadmap for integrating AI governance into Indonesia's broader regulatory

ecosystem. The 2008 Electronic Information and Transactions Law (EIT)[28] governs electronic systems and transactions, and indirectly covers AI-driven platforms. Article 15 mandates that electronic system providers ensure the reliability, security, and accountability of their systems, which applies to AI-powered digital payment and trading platforms. Article 26 regulates data protection, which requires institutions to safeguard user data and comply with privacy standards. These provisions, while not AI-specific, create a baseline for ethical and secure AI adoption in financial markets.

The 2020 Bank Indonesia Regulation on Payment System Risk Management emphasises the importance of managing the risks associated with digital payment systems, indirectly influencing AI-driven technologies. Section 4.2 requires institutions to implement robust risk management frameworks that focus on cybersecurity and operational resilience. These principles apply to AI systems that facilitate payments or automate transaction processes, thereby ensuring reliability and security. The Financial Services Authority (OJK) Regulation on Consumer Protection in Financial Services (POJK No. 1/2013) establishes consumer rights in financial services, indirectly affecting AI-driven systems. Section 3 mandates that institutions disclose the methodologies used in credit scoring and investment recommendations to promote transparency in AI applications. Section 5 emphasises the importance of clear communication in financial products, ensuring that consumers understand the role of AI in decision-making processes.

IV.D. Comparative Analysis

Hypothesis 1: *Financial institutions in jurisdictions with mature AI regulations demonstrate higher operational efficiency and consumer trust than those with less developed frameworks.*

The United States' legal framework strongly validates H1 by combining foundational doctrines and AI-specific measures that enhance operational reliability and consumer trust. Title I of Dodd-Frank empowers FSOC to monitor systemic risks, including those introduced by AI-powered trading platforms. Sections 723 and 727 of Title VII mandate central clearing and real-time reporting of derivatives transactions to ensure transparency and accountability in AI-driven operations. Additionally, the FTC Guidelines on Algorithms and AI (2020) emphasise the explainability, fairness, and regular validation of AI systems, ensuring their accuracy and building consumer confidence. Together, these provisions create a robust framework that supports operational efficiency while mitigating the risks that can erode trust in AI-enabled financial services.

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[28] *Undang-Undang Republik Indonesia Nomor 11 Tahun 2008 tentang Informasi dan Transaksi Elektronik* [Law of the Republic of Indonesia Number 11 of 2008 concerning Electronic Information and Transactions].

In Malaysia, the RMiT Guidelines and CMP3 promote operational efficiency by mandating risk management and governance frameworks for advanced technologies, including AI. Section 3.1 of the RMiT requires institutions to identify and mitigate risks associated with technological systems, while Section 4.2 emphasises rigorous model validation. However, these frameworks do not explicitly address transparency and bias in AI, limiting their ability to comprehensively build consumer trust. In Indonesia, the DFI Roadmap and Article 15 of the Electronic Information and Transactions Law establish basic requirements for system reliability and security, indirectly supporting operational efficiency. Nonetheless, the absence of enforceable provisions for algorithmic accountability and transparency undermines Indonesia's capacity to fully validate H1.

Hypothesis 2: *The adoption and integration of AI in financial services are directly correlated with comprehensive normative and cultural-cognitive frameworks.*

Normative and cultural-cognitive frameworks play critical roles in shaping the adoption and ethical integration of AI in financial markets. The United States demonstrates a strong alignment with H2 through its enforceable laws and ethical mandates. The FTC Guidelines on Algorithms and AI (2020) enforce the principles of fairness, transparency, and accountability, fostering cultural-cognitive alignment by ensuring that AI systems adhere to societal expectations.

Malaysia's regulatory environment partially validates H2 by embedding normative principles into its broader strategic plans, such as the Industry4WRD initiative. Although not enforceable, this policy emphasises ethical AI deployment, workforce readiness, and technological governance. The PDPA further incorporates cultural-cognitive principles by mandating data accuracy (Section 8) and consent for data processing (Section 6), aligning AI deployment with societal expectations of privacy and fairness. Indonesia, through the Presidential Regulation on the National AI Strategy emphasises ethical AI adoption and inter-agency collaboration (Section 5). However, the lack of enforceable measures tailored to financial markets reduces the Indonesian legal framework's ability to foster robust normative and cultural-cognitive frameworks, leaving H2 partially validated in Malaysia and Indonesia.

Hypothesis 3: *Jurisdictions with proactive AI regulatory policies exhibit significant reductions in AI-related financial risks, including fraud and algorithmic bias.*

Proactive regulatory policies are critical for mitigating AI-related financial risks such as fraud, systemic vulnerabilities, and algorithmic biases. The United States provides strong support for H3 through enforceable laws and compliance requirements. The FTC Guidelines on A Algorithms and AI (2020) require regular audits and testing to prevent biases and inaccuracies in

AI systems. In addition, the GLBA ensures robust data governance, reducing the risk of biased or incomplete datasets being used in AI models. These measures collectively mitigate financial risk and comprehensively validate H3.

Malaysia's framework partially addresses H3, focusing on risk management and data governance through the RMiT Guidelines and PDPA. Section 4.2, the RMiT emphasises model validation, indirectly addressing algorithmic errors and fraud, whereas the PDPA ensures that the of data in AI systems complies with privacy and accuracy standards. However, the lack of explicit provisions for systemic risks and algorithmic biases limits the effectiveness of the framework in reducing AI-specific financial risks. In Indonesia, the ITE and the Bank Indonesia Regulation on Payment System Risk Management establish basic safeguards for data security and operational resilience, but their broad focus and lack of enforceable AI-specific provisions undermine their ability to address complex financial risks. As a result, while the United States robustly supported H3, Malaysia and Indonesia provided only partial validation.

Effective AI governance requires regulatory mechanisms that guarantee accountability, risk mitigation, and transparency in financial markets. Compliance audits, as stipulated by Malaysia's RMiT Guidelines (2020), necessitate financial institutions to perform regular evaluations of AI-driven models to ensure adherence to risk management protocols, preservation of algorithmic fairness, and conformity with ethical standards. Algorithmic transparency regulations, exemplified by the EU AI Act, mandate that financial institutions reveal the mechanisms by which AI models produce results, necessitating elucidated decision-making processes subject to scrutiny by regulators and consumers. These mechanisms collectively guarantee that AI systems are technically efficient and compliant with legal and ethical standards.

IV.E. Demographic Profiles, Validity, and Reliability

Of the 437 questionnaires distributed, 403 valid responses were collected, yielding a response rate of 92.2%. The demographic profiles of the respondents, as presented in Table 4, reflect a well-balanced representation of key variables. The gender distribution was relatively even, with 54.1% males (n=218) and 45.9% females (n=185). Respondents were predominantly within the 26–35 age group (38.7%, n=156), followed by 36–45 (30.8%, n=124), 18–25 (15.6%, n=63), and 46 and above (14.9%, n=60), capturing the diverse age groups relevant to the study's focus on financial market participants.

Table 4 also shows the diversity in educational attainment, with 45.2% (n=182) holding a bachelor's degree, 22.1% (n=89) holding master's/doctoral degrees, 19.9% (n=80) holding diplomas, and 12.9% (n=52) completing secondary education. The occupation data revealed that professionals

represented the largest group (41.9%, n=169), followed by business owners (31.8%, n=128). Students constituted the smallest group (7.4%, n=30), with other occupations accounting for 18.9% of the sample (n=76). Investment experience was also diverse, with 31.5% (n=127) reporting 1–3 years of experience, 24.8% (n=100) having 4–6 years, 22.8% (n=92) less than one year, and 20.8% (n=84) more than six years. Geographically, Table 4 highlights the distribution of respondents across the United States (40.9%, n=165), Malaysia (30.5%, n=123), and Indonesia (28.5%, n=115).

Table 4.
Demographic Profile of Respondents

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	218	54.1
	Female	185	45.9
Age Group	18–25	63	15.6
	26–35	156	38.7
	36–45	124	30.8
	46 and above	60	14.9
Education Level	Secondary	52	12.9
	Diploma	80	19.9
	Bachelor's Degree	182	45.2
	Master's/Doctoral Degrees	89	22.1
Occupation	Professional	169	41.9
	Business Owner	128	31.8
	Student	30	7.4
	Other	76	18.9
Investment Experience	Less than 1 year	92	22.8
	1–3 years	127	31.5
	4–6 years	100	24.8
	More than 6 years	84	20.8
Country of Origin	United States	165	40.9
	Malaysia	123	30.5
	Indonesia	115	28.5

The constructs used in this study, as detailed in Table 5, were designed to reflect the hypotheses and research subjects accurately. The Independent Variables (IVs) include Systemic Risk Management, Transparency and Accountability, and Technological Innovation, all of which influence the Dependent Variable (DV) and Consumer Trust. Financial Risk Mitigation serves as a Mediating Variable (MV), capturing the extent to which the management of AI-specific risks strengthens the relationship between IVs and the DV. Each construct was measured using seven standardised items to ensure

a comprehensive assessment of the underlying dimensions. Factor loadings ranged from 0.71 to 0.89, confirming strong convergent validity. Reliability was assessed using Cronbach's Alpha and Composite Reliability (CR), with all constructs achieving values above 0.85, indicating high internal consistency. The Average Variance Extracted (AVE) values exceeded the threshold of 0.50, affirming that the constructs adequately captured their intended dimensions.

Table 5.
Validity and Reliability Results

Construct	Items	Factor Loadings	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Systemic Risk Management	7	0.72–0.87	0.88	0.91	0.65
Transparency and Accountability	7	0.73–0.88	0.87	0.90	0.64
Technological Innovation	7	0.74–0.89	0.86	0.90	0.63
Consumer Trust	7	0.71–0.86	0.85	0.89	0.62
Financial Risk Mitigation	7	0.75–0.88	0.87	0.91	0.66

IV.F. Questionnaire Response Analysis

The items in Table 6 reveal the nuanced perceptions of investors regarding the integration of AI into financial markets and their alignment with regulatory frameworks. Systemic Risk Management, as a construct, highlights investors' recognition of AI's ability to enhance risk monitoring and mitigate systemic vulnerabilities, with mean scores ranging from 4.12 to 4.28. This agreement reflects confidence in AI's real-time monitoring capabilities and its predictive precision in identifying financial risks. However, the variability in standard deviations (SD: 0.77 to 0.86) underscores differing experiences, potentially influenced by disparities in regulatory oversight and maturity of AI systems across regions. For instance, while AI has shown potential to reduce volatility and enhance market stability, gaps in consistent regulatory enforcement may limit its effectiveness.

Transparency and accountability have emerged as cornerstones of investor trust, with mean values between 4.18 and 4.32 reflecting strong expectations for explainable and auditable AI-driven decisions. Investors expressed particular concern over the clarity and accessibility of the AI processes used in financial platforms, emphasising the role of regulatory standards in ensuring transparency. The observed variability in SD values (0.75 to 0.88) points to

inconsistencies in how different platforms implement these standards, likely because of varying degrees of commitment to compliance or disparities in technical resources. Despite these challenges, the high mean scores indicate that investors remain optimistic about the potential of ethical and transparent AI systems to foster accountability. However, achieving this requires concerted efforts from regulators and institutions to embed transparency in the operational fabric of AI technologies, ensuring that investor expectations are met uniformly across jurisdictions.

Technological innovation recorded the highest mean scores (4.25 to 4.34), reflecting widespread optimism about AI's transformative impact on financial decision-making and operational efficiency. Investors have consistently highlighted the benefits of AI in advancing analytics, optimising portfolio management, and enabling rapid adaptation to market changes. Nevertheless, the variability in standard deviations (0.79 to 0.88) signals challenges related to unequal access to advanced AI tools and infrastructure, which may prevent some investors from fully benefiting from technological advancement. Similarly, Consumer Trust, as the dependent variable, achieved high mean scores (4.15 to 4.27), underscoring the critical role of AI security, transparency, and regulatory compliance in fostering confidence. Finally, Financial Risk Mitigation, the mediating variable, demonstrated consistency with mean values between 4.18 and 4.28, reflecting widespread confidence in the AI's ability to detect fraud and optimise risk management strategies. However, the variability in responses suggests that the practical application of AI in mitigating risks is uneven and influenced by institutional readiness and regulatory coherence.

Table 6.
Questionnaire Response

Construct	Code	Item	Mean	SD	Source
Systemic Risk Management	SRM1	AI enhances the detection of liquidity risks during volatile market conditions.	4.21	0.82	Giudici (2018)[29]
	SRM2	AI predicts cross-market contagion risks effectively.	4.18	0.79	
	SRM3	Real-time monitoring by AI minimises systemic vulnerabilities in financial operations.	4.25	0.84	
	SRM4	AI-driven analytics improve the accuracy of systemic risk stress tests.	4.20	0.81	
	SRM5	Regulatory oversight strengthens the reliability of AI in risk management.	4.15	0.80	
	SRM6	AI reduces delays in identifying market disruptions, enhancing investor confidence.	4.12	0.78	
	SRM7	AI systems support the integration of multi-market risk assessment frameworks.	4.22	0.83	
Transparency and Accountability	TA1	AI-generated investment reports include accessible and explainable data visualisations.	4.28	0.86	Anang et al. (2024)[30]
	TA2	AI platforms provide traceable decision-making processes in investment analytics.	4.27	0.79	
	TA3	AI systems comply with cross-jurisdictional regulatory transparency standards.	4.22	0.80	
	TA4	Ethical AI systems ensure unbiased recommendations for portfolio management.	4.24	0.83	
	TA5	AI audits are conducted regularly to maintain compliance with transparency requirements.	4.18	0.78	
	TA6	Investors can review past AI-driven decisions for accountability and learning purposes.	4.25	0.81	
	TA7	AI tools promote fairness in automated trading through audit trails.	4.30	0.85	

[29] Giudici, "Fintech Risk Management: A Research Challenge for Artificial Intelligence in Finance," *Frontiers in Artificial Intelligence* 1 (2018): 1-10.

[30] Anang, Andrew Nii, Oluwatosin Esther Ajewumi, Tobi Sonubi, Kenneth Chukwujekwu Nwafor, John Babatope Arogundade, and Itiade James Akinbi. "Explainable AI in financial technologies: Balancing innovation with regulatory compliance." *International Journal of Science and Research Archive* 13, no. 1 (2024): 1793-1806.

Table 6.
Questionnaire Response (Continued)

Construct	Code	Item	Mean	SD	Source
Technological Innovation	TI1	AI improves the accuracy and relevance of investment risk forecasts.	4.33	0.84	Ridzuan et al. (2024)[31]
	TI2	AI accelerates portfolio diversification strategies through advanced simulations.	4.27	0.82	
	TI3	Advanced AI systems allow investors to customise analytics based on market needs.	4.29	0.79	
	TI4	AI platforms optimise real-time adjustments in investment strategies.	4.31	0.86	
	TI5	AI facilitates seamless integration of global financial market datasets.	4.25	0.80	
	TI6	AI enhances trading execution efficiency during high-frequency transactions.	4.30	0.83	
	TI7	AI-powered innovation accelerates sustainable investment opportunities.	4.34	0.81	
Consumer Trust	CT1	Investors trust AI's adherence to data privacy laws during financial transactions.	4.25	0.87	Zhang (2024)[32]
	CT2	AI systems comply with investor protection frameworks, ensuring fairness and security.	4.22	0.78	
	CT3	AI platforms maintain transparent fee structures to build investor confidence.	4.27	0.83	
	CT4	Regular updates to AI models maintain their alignment with evolving market regulations.	4.21	0.81	
	CT5	Investors value clear disclaimers explaining the scope and limitations of AI insights.	4.15	0.79	
	CT6	AI systems provide alerts to prevent excessive risk exposure, fostering trust.	4.18	0.80	
	CT7	AI platforms implement feedback loops to refine investor-facing tools consistently.	4.30	0.86	

[31] Nurhadhinah Nadiah Ridzuan et al., "AI in the Financial Sector: The Line Between Innovation, Regulation, and Ethical Responsibility," *Information* 15, no. 8 (2024): 432.

[32] Shenyu Zhang, "Consumer Attitudes Towards AI-Based Financial Advice: Insights for Decision Support Systems (DSS) and Technology Integration," *Journal of Internet Services and Information Security* 10, no. 4 (2024): 1-15.

Table 6.
Questionnaire Response (Continued)

Construct	Code	Item	Mean	SD	Source
Financial Risk Mitigation	FRM1	AI tools improve the detection of fraudulent patterns in financial transactions.	4.28	0.85	Duo et al. (2023)[33]
	FRM2	AI minimises biases in automated decision-making during volatile trading periods.	4.18	0.80	
	FRM3	AI's anomaly detection systems enhance risk mitigation frameworks.	4.22	0.81	
	FRM4	AI improves the reliability of compliance processes for cross-border transactions.	4.24	0.82	
	FRM5	Real-time AI-driven fraud alerts enhance institutional safeguards against market risks.	4.20	0.83	
	FRM6	AI supports adaptive strategies for mitigating environmental and social investment risks.	4.27	0.84	
	FRM7	Algorithmic accuracy in AI enhances overall investor confidence in risk controls.	4.25	0.79	

The results in Table 7 reveal the intricate relationships between the independent variables. From an investor standpoint, the dominant total effect of Transparency and Accountability on Consumer Trust ($\beta = 0.680$, $p = 0.004$) underscores the critical importance of explainability in AI systems. Investors increasingly demand systems that offer auditable decision trails and real-time compliance checks, particularly in high-stakes scenarios such as portfolio adjustments or risk hedging. The high t-value (7.042) reflects the stability of this relationship, emphasising that transparency reduces cognitive uncertainty and perceived risk, which are the key drivers of trust.

The mediating role of Financial Risk Mitigation ($\beta = 0.428$, $p = 0.005$) reflects its significance in addressing investor concerns about AI's capacity to safeguard against fraud, bias, and systemic shocks. Investors view AI's real-time anomaly detection and fraud prevention capabilities as essential tools for derisking their investments, especially in volatile markets. The indirect effect of Transparency and Accountability ($\beta = 0.208$) through Financial Risk Mitigation suggests that transparent AI systems not only directly enhance trust but also empower risk-mitigation strategies. From an investor's perspective,

[33] Duo, Yan, Wang Guangyu, Ni Shiwen, Huang Peiming, Man Guang Yao, and Ooi Kok Loang. "Financial Risk Management Strategies in the Banking Sector." International Journal of Accounting 8, no. 50 (2023): 363-380.

this dual role is particularly valuable in preventing adverse market outcomes such as flash crashes or algorithmic trading errors. Similarly, the indirect effects of Systemic Risk Management (β = 0.183) and Technological Innovation (β = 0.165) on Financial Risk Mitigation highlight the integrated nature of these constructs. For investors, systemic risk management ensures market stability and confidence in long-term investments, whereas technological innovation enhances adaptability to market changes.

Direct effects, such as Systemic Risk Management on Consumer Trust (β = 0.392, p = 0.006), show that investors value systems that proactively manage liquidity risk and cross-market contagion. However, the lower direct effect compared to the total effect suggests that systemic risk management alone may not be sufficient to establish trust without effective risk-mitigation mechanisms. Technological innovation, with a direct effect on Consumer Trust (β = 0.341, p = 0.007), demonstrates the importance of technological advancements, such as high-frequency trading systems and AI-driven predictive analytics. Nonetheless, the weaker indirect effect of technological innovation (β = 0.165) compared with transparency reflects that investors require more than operational efficiency to build trust; they also demand ethical oversight and accountability. The significant direct effect of Transparency and Accountability on Financial Risk Mitigation (β = 0.496, p = 0.003) reinforces this narrative, highlighting that investors prioritise platforms that pair technological sophistication with robust regulatory compliance. These findings suggest that, while investors recognise the value of AI-driven systems, their confidence ultimately hinges on transparency and the ability to manage risks effectively.

Table 7.
Path Coefficients (Direct and Indirect Effects)

Path	Direct effect	Indirect effect	Total effect	t-Value	p-Value
Systemic Risk Management → Consumer Trust	0.392	0.183	0.575	5.125	0.006
Transparency and Accountability → Consumer Trust	0.472	0.208	0.680	7.042	0.004
Technological innovation → Consumer Trust	0.341	0.165	0.506	4.825	0.007
Systemic Risk Management → Financial Risk Mitigation	0.371	–	0.371	4.982	0.009
Transparency and Accountability → Financial Risk Mitigation	0.496	–	0.496	7.501	0.003
Technological innovation → Financial Risk Mitigation	0.324	–	0.324	4.603	0.010
Financial Risk Mitigation → Consumer Trust	0.428	–	0.428	6.231	0.005

V. CONCLUSION

This study examined the influence of regulatory frameworks, transparency mechanisms, and technological advancements on AI adoption in financial markets using a sample of financial institutions and investors in the United States, Malaysia, and Indonesia.

The findings validate Hypothesis 1 in the United States, where robust regulatory frameworks, including the provisions of Dodd-Frank and FTC Guidelines, enhance operational efficiency and bolster consumer trust. Malaysia partially supports Hypothesis 1 through legal provisions such as the RMiT Guidelines (2020) and Capital Markets Masterplan 3 (2021), which promote technological risk management but lack explicit mechanisms for algorithmic accountability and transparency. In Indonesia, while the Digital Finance Innovation Roadmap (2018) and UU ITE (2008) establish foundational provisions for system reliability, their broad scope and the absence of enforceable AI-specific measures limit their alignment with Hypothesis 1. The questionnaire results further highlight disparities, with transparency and accountability scoring high in the United States, moderate in Malaysia, and low in Indonesia.

Hypothesis 2, which posits the integration of normative and cultural-cognitive frameworks into AI adoption, is affirmed through an analysis of legal and institutional structures. The United States demonstrates alignment through enforceable norms, such as the cultural-cognitive principles embedded in the FTC Guidelines. These mechanisms drive ethical AI adoption and foster investor trust, as reflected in high consumer trust scores. In Malaysia, cultural-cognitive principles are embedded in the Industry4WRD, but their non-binding nature limits their influence. Indonesia's National AI Strategy similarly emphasises collaboration, but lacks enforceable mandates tailored to financial markets, as reflected in the lower consumer trust score. These findings underscore the need to enforce norms to strengthen AI adoption across jurisdictions.

The findings of this study suggest that, while standalone AI legislation may offer clarity and specificity, it is not a prerequisite for regulatory effectiveness in emerging markets. In Malaysia and Indonesia, where comprehensive AI laws have not yet been established, existing frameworks such as the RMiT Guidelines and the DFI Roadmap provide partial but functional governance over AI applications in finance. However, their impact is constrained by their limited enforcement and definitional ambiguity. This is evidenced by the lower transparency and accountability scores in both countries, with Indonesia particularly underperforming in explainability and auditability indicators. Given these constraints, the empirical data support a more incremental

approach, embedding AI governance principles within existing financial regulations, enhancing sector-specific guidelines, and introducing targeted policy instruments such as regulatory sandboxes

V.A. THEORETICAL, MANAGERIAL, AND LEGAL IMPLICATIONS

Theoretically, this study enhances the scholarly understanding of AI governance by situating it within the framework of institutional theory, which underscores the interplay between regulatory, normative, and cultural-cognitive pillars in shaping organisational behaviour. Regulatory maturity, reflecting the regulatory pillar of institutional theory, fosters compliance and operational efficiency, while the embedding of accountability and fairness principles within enforceable policies aligns with normative and cultural-cognitive pillars. These elements collectively ensure that AI adoption resonates with societal values, enhances institutional performance, and strengthens consumer trust in the financial markets.

Managerially, these findings provide actionable strategies for financial institutions to align their operations with regulatory and institutional expectations. Institutions must ensure compliance with frameworks and address the regulatory pillar while fostering normative expectations for ethical AI adoption. Transparency mandates further emphasised cultural-cognitive alignment by ensuring socially acceptable decision-making processes.

The policy implications of this study include regulators, financial institutions, and AI developers. Regulators should establish harmonised AI governance frameworks to ensure algorithmic accountability, risk mitigation, and cross-border financial stability. Financial institutions must implement AI audits, bias mitigation, and transparency mechanisms to align themselves with regulatory expectations and build consumer trust. AI developers should prioritise explainable AI models, data security, and ethical design principles to enhance compliance and societal acceptance. Collaboration among these stakeholders is essential for responsible AI adoption, which balances innovation, regulation, and financial stability.

V.B. LIMITATIONS AND RECOMMENDATIONS FOR FUTURE STUDIES

This study had several limitations. First, reliance on self-reported data introduces potential response bias, limiting the generalisability of the findings. Second, focusing exclusively on the United States, Malaysia, and Indonesia narrows the applicability of the results to other global contexts with different regulatory and cultural environments. Finally, the rapid evolution of AI technologies and regulatory landscapes may challenge the long-term relevance

of our conclusions. Future research should adopt longitudinal designs to capture the evolving relationship between AI adoption and governance better. Furthermore, qualitative methodologies such as interviews with policymakers, regulators, and financial executives could provide deeper insights into the practical challenges and opportunities associated with AI governance.

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