

# Digital Economy Regulation and Consumer Rights Protection: Realizing Security in Financial Technology Transactions

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## Abstract

Financial technology has experienced rapid expansion amidst the digital economic development that has made services more accessible while increasing financial inclusion. The rapid growth of financial technology creates substantial challenges for consumer protection. The primary problems arise from inadequate data protection measures and electronic payment security protocols. The lack of proper security measures and insufficient digital literacy exposes consumers to increasing risks of data theft, phishing

attacks, and personal information misuse. This research evaluates the current regulatory structure that defends consumer rights and ensures secure financial operations through technological systems. The study adopts a normative legal research method through statutory analysis. The research shows that Indonesia's regulatory framework extends broad protection but requires modernization to address contemporary technological developments and emerging security risks. Fintech requires a regulatory framework that adjusts to evolving conditions while fostering partnerships to deliver adequate consumer protection.

**KEYWORDS:** *Regulation, Digital Economy, Consumer Protection, Fintech*

## Introduction

The growth of fintech in Indonesia has been extraordinary in recent years.<sup>1</sup> The growth of fintech can be seen in the birth of various kinds of digital-based financial services, including digital banks, digital payments, fintech lending, securities crowdfunding, and insurance technology (insurtech).<sup>2</sup> In November 2022, the Bank of Indonesia reported that electronic money transactions were valued at IDR 35.3 trillion, which showed a 12.84% year-over-year (yoy) growth. Bank of Indonesia recorded a 13.88 percent year-on-year growth in digital banking transactions, which reached IDR 561.2 trillion during that period.<sup>3</sup> The substantial growth in digital bank transactions shows a significant shift toward digital financial operations while traditional banking practices diminish. The digital bank transaction growth continued at 40.1% during November 2024 as a year-on-year increase. Experts predict the digital banking industry will advance by 52.3% in 2025.<sup>4</sup>

The growing adoption of digital payments co-occurred with

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<sup>1</sup> Wimboh Santoso et al., "Talent Mapping: A Strategic Approach toward Digitalization Initiatives in the Banking and Financial Technology (FinTech) Industry in Indonesia," *Journal of Science and Technology Policy Management* 12, no. 3 (2020): 399–420, <https://doi.org/10.1108/JSTPM-04-2020-0075>.

<sup>2</sup> Afif Noor, Wulandari, Dwi, Aqila-Syarief Muhammad Afif, "Regulating Fintech Lending in Indonesia: A Study of Regulation of Financial Services Authority No. 10/POJK.05/2022," *Qubahan Academic Journal* 3, no. 4 (2023): 206–18, <https://doi.org/https://doi.org/10.48161/qaj.v3n4a156>.

<sup>3</sup> Antonius Purwanto, "Geliat Bank Digital Di Tengah Ketatnya Industri Perbankan," *kompas.id*, 2024, <https://www.kompas.id/baca/riset/2024/01/20/geliat-bank-digital-di-tengah-ketatnya-industri-perbankan>.

<sup>4</sup> Mentari Puspadini, "Transaksi Bank Digital Tumbuh 40,1%, Didominasi Gen Z & Milenial," *cnbcindonesia.com*, 2025, <https://www.cnbcindonesia.com/market/20250314201903-17-618812/transaksi-bank-digital-tumbuh-401-didominasi-gen-z-milenial>.

digital bank expansion. The volume of mobile and internet banking application transactions increased by 29.7% year-over-year (yoy) in January 2025 and 19.8% year-over-year (yoy) during the same period. The number of digital payment transactions processed through QRIS (Quick Response Code Indonesian Standard) grew at 170.1% year-over-year.<sup>5</sup>

The financial technology industry sector of fintech lending demonstrates substantial growth even when the general economy faces uncertainty. The outstanding amount of fintech lending financing reached IDR 78.50 trillion in January 2025, representing a 29.94% increase from the previous year.<sup>6</sup> The securities crowdfunding (SCF) sector followed a similar pattern of expansion in fintech lending. The eighteen SCF organizing platforms raised a total IDR 1.38 trillion during January 2025 while linking 727 securities issuers to 173,686 investors.<sup>7</sup> The SCF platform utilized the funds it collected throughout 2024 to support micro, small, and medium enterprises until they reached IDR 1.53 trillion.<sup>8</sup> These statistics demonstrate how the SCF platform functions as a vital tool to advance the growth of Indonesia's small business sector.

The Insurtech industry demonstrates growth because technological adoption increases premium value. The company PT Asuransi Simas Insurtech focuses on achieving a premium growth of 24% during the 2025 period. The company achieved a gross premium of IDR 3.61 trillion in November 2024, demonstrating a 138.16% annual growth (yoy) from IDR 1.51 trillion in November 2023.<sup>9</sup> The leading digital insurance company PT Asuransi Digital Bersama plans to increase its premium revenue between IDR 420 and IDR 430 billion in 2025 while surpassing its previous target of IDR 320 billion.<sup>10</sup>

<sup>5</sup> Belinda, "Transaksi Keuangan Digital Meningkat, Bank Dan Fitur Digital Yang Diminati," *vibiznews.com*, 2025, <https://vibiznews.com/index.php/2025/02/23/transaksi-keuangan-digital-meningkat-bank-dan-fitur-digital-yang-diminati/>.

<sup>6</sup> Ferry Saputra, "Outstanding Pembiayaan Fintech P2P Lending Rp 78,50 Triliun per Januari 2025," *keuangan*, 2025, <https://keuangan.kontan.co.id/news/outstanding-pembiayaan-fintech-p2p-lending-rp-7850-triliun-per-januari-2025>.

<sup>7</sup> Otoritas Jasa Keuangan RI, "Carbon Exchange and Securities Crowdfunding (SCF) Update January 2025," *Institute.ojk.go.id*, 2025, <https://institute.ojk.go.id/iru/dataandstatistics/detaildataandstatistics/13558/carbon-exchange-and-securities-crowdfunding-scf-update-january-2025>.

<sup>8</sup> Aziz Rahardyan, "Kontribusi Fintech Urun Dana Syariah Tembus 52% Sepanjang 2024," *finansial.bisnis.com*, 2025, <https://finansial.bisnis.com/read/20250115/563/1831734/kontribusi-fintech-urun-dana-syariah-tembus-52-sepanjang-2024>.

<sup>9</sup> Pernita Hestin Untari, "Asuransi Simas InsurTech Targetkan Pertumbuhan Double Digit Pada 2025," *finansial.bisnis.com*, 2024, <https://finansial.bisnis.com/read/20241230/215/1827701/asuransi-simas-insurtech-targetkan-pertumbuhan-double-digit-pada-2025>.

<sup>10</sup> Aulia Ivanka Rahmana, "Strategi Perusahaan Asuransi Insurtech Raih Pertumbuhan Kinerja

Multiple fintech platforms demonstrate that Indonesia's digital economy sector continues to expand successfully. According to projections, the digital economy in Indonesia will expand to USD 146 billion in 2025 before reaching USD 330 billion by 2030.<sup>11</sup> The digital economy must grow quickly, backed by strong digital infrastructure, trained human resources, and reliable regulatory frameworks.<sup>12</sup> Developing a digital economy roadmap requires funding support through crowdfunding and digital platform credit for small businesses and consumers, who need protection because Indonesia lacks digital economy regulations.<sup>13</sup> The government has established several digital economy-related laws and regulations, including the Personal Data Protection Law (PDP Law) No. 27 of 2022 and the Electronic Information and Transaction Law (ITE Law) No. 19 of 2016, together with multiple Financial Services Authority (OJK) Fintech Regulations. Still, these laws have not successfully monitored the growth of the digital economy.

Weak online financial transactions, rising online fraud cases, identity theft incidents, and financial data misuse have damaged public trust in digital services.<sup>14</sup> Research involving 1,700 participants revealed that 98.3% of the 1,671 respondents experienced digital fraud messages, while 66.6% of participants (1,132 individuals) became actual victims.<sup>15</sup> The statistics demonstrate that digital fraud affects Indonesians to a high degree. The Cyber Crime Statistic report for 2022 verifies Indonesia's position as the third nation worldwide for data breaches by documenting 13.2 million internet user accounts.<sup>16</sup>

Current regulations have failed to create better security

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Pada 2025," *keuangan.kontan.co.id*, 2025, [https://keuangan.kontan.co.id/news/strategi-perusahaan-asuransi-insurtech-raih-pertumbuhan-kinerja-pada-2025?utm\\_source=chatgpt.com](https://keuangan.kontan.co.id/news/strategi-perusahaan-asuransi-insurtech-raih-pertumbuhan-kinerja-pada-2025?utm_source=chatgpt.com).

<sup>11</sup> Tusta Citta Ihtisan Tri Prasidya and Wahyu Candra Dewi, "Digital Economy To Boost Economy Recovery Post-Pandemic: Indonesia'S Strategic Position As New Economic Power in Southeast Asia," *Global South Review* 4, no. 2 (2023): 81, <https://doi.org/10.22146/globalsouth.83331>.

<sup>12</sup> Gati Gayatri, I. Gede Nyoman Mindra Jaya, and Vience Mutiara Rumata, "The Indonesian Digital Workforce Gaps in 2021–2025," *Sustainability (Switzerland)* 15, no. 1 (2023), <https://doi.org/10.3390/su15010754>.

<sup>13</sup> Vience Mutiara and Ashwin Sasongko Sastrosubroto Rumata, "The Paradox of Indonesian Digital Economy Development," in *E-Business - Higher Education and Intelligence Applications*, ed. Robert M.X. Wu (Intechopen, 2021), 13, <https://www.intechopen.com/books/advanced-biometric-technologies/liveness-detection-in-biometrics>.

<sup>14</sup> Thanh Tam Le et al., "The Impact of Online Identity Theft on Customers' Usage Intention of E-Banking Transactions in Uncertain Context," *Journal of Governance and Regulation* 12, no. 4 (2023): 60–71, <https://doi.org/10.22495/jgrv12i4art6>.

<sup>15</sup> Novi Kurnia et al., *Penipuan Digital Di Indonesia (Modus, Medium, Dan Rekomendasi)*, vol. 1 (Yogyakarta: Program Studi Magister Ilmu Komunikasi Fakultas Ilmu Sosial dan Ilmu Politik Universitas Gadjah Mada, 2022).

<sup>16</sup> Arlina Laras, "OJK Ungkap 5 Negara Dengan Data Breach Terbanyak, Ada Indonesia?," *ekonomi.bisnis.com*, 2024, <https://ekonomi.bisnis.com/read/20240729/9/1786156/ojk-ungkap-5-negara-dengan-data-breach-terbanyak-ada-indonesia>.

measures and consumer protection, essential to building public trust in the digital economy.<sup>17</sup> Users face mounting difficulties in maintaining online safety due to insufficient protective measures. User data protection requires government-private sector cooperation for better cybersecurity protocols and stronger regulatory measures to achieve adequate user data security.

The research by Arifin et al. shows that online trading generates numerous theoretical problems and conceptual dilemmas. The study recommends implementing complete and flexible regulations to maintain digital economy progression while guaranteeing adequate consumer protection.<sup>18</sup> The research conducted by Dinh et al. demonstrates that technological progress and economic globalization create opportunities to strengthen financial sector consumer protection in the digital economy across 135 countries. The government needs to implement policies that promote the implementation of new technology alongside innovation and prevent an excessive focus on citizen protection.<sup>19</sup>

Government digital regulations should be used to support the adoption of new technology while avoiding restrictions that limit fintech innovation. The study by Tan et al. investigates how Chinese corporate fintech innovation responds to governmental regulation. Tan et al. present findings showing that government regulation and fintech innovation collaborate to achieve positive governance benefits that enhance consumer protection and boost market stability and financial inclusion.<sup>20</sup> The combination of regulatory frameworks with fintech development creates conditions that build trust in digital financial systems while establishing clear guidelines for their advancement. The legal nature of the digital economy demands regulatory-fintech synergy because Laguna de Paz establishes in his research the implications of the digital economy on financial regulation and supervision. Implementing technology combined with big data enhances operational efficiency but requires proper regulation to preserve essential rights, including privacy protection and discrimination prevention. Big tech regulations need

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<sup>17</sup> Rina Arum Prastyanti and Ridhima Sharma, "Establishing Consumer Trust Through Data Protection Law as a Competitive Advantage in Indonesia and India," *Journal of Human Rights, Culture and Legal System* 4, no. 2 (2024): 354–90, <https://doi.org/10.53955/jhcls.v4i2.200>.

<sup>18</sup> Ridwan Arifin et al., "Protecting the Consumer Rights in the Digital Economic Era: Future Challenges in Indonesia," *Jambura Law Review* 3 (2021): 135–60, <https://doi.org/10.33756/jlr.v3i0.9635>.

<sup>19</sup> Van Dinh et al., "Determinants Affecting Digital Financial Consumer Protection: Evidence from 135 Countries," *Journal of Economic Asymmetries* 27, no. April (2023): e00301, <https://doi.org/10.1016/j.jeca.2023.e00301>.

<sup>20</sup> Weijie Tan et al., "Unintended Consequences: Examining the Effects of Government Digital Regulation on Corporate Fintech Innovation in China," *Emerging Markets Review* 64, no. November 2024 (2025): 101221, <https://doi.org/10.1016/j.ememar.2024.101221>.

evaluation to assess their effectiveness.<sup>21</sup>

These studies follow the same trajectory in examining digital economy regulatory issues and consumer protection. The research focuses on the effects of regulatory measures on fintech innovation during the digital economy era but does not provide specific findings about this topic. The current study differs from the others because it examines digital economy regulations alongside consumer rights protection in fintech transactions operating within the digital economy. Studying digital economy regulations and consumer rights protection in financial technology transactions has become essential since the digital economy and financial technology development pose dangerous risks to users who need fund security guarantees, legal certainty, and justice.<sup>22</sup> The digital economy continues to expand rapidly with financial technology advancements, which creates dangerous situations because of cyber threats and data breaches. Establishing proper regulations will create an innovative digital economy ecosystem with optimal consumer protection in financial technology transactions.

This research investigates the improvement of Indonesian digital economy regulations that protect consumers and establish security measures for financial technology services in digital economy transactions. The objective aims to promote transparency while ensuring justice and legal certainty. The research seeks proper regulation to maintain equilibrium between fintech company expansion, consumer protection, and financial system stability. The investigation into digital economy regulations of financial technology services serves as a foundation to create adaptive policies that match the evolving requirements of a secure digital economy, which benefits consumers, thus generating optimism about future developments.

The research requires an extensive evaluation of digital economy regulations, which includes fintech-specific laws and regulations, to answer the research questions. This study uses normative juridical research with a statute approach to systematically evaluate the subject matter. The research draws its primary data from secondary sources, combining primary legal materials consisting of laws and regulations with secondary legal

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<sup>21</sup> José Carlos Laguna de Paz, "Some Implications of the New Global Digital Economy for Financial Regulation and Supervision," *Journal of Banking Regulation* 24, no. 2 (2023): 146–55, <https://doi.org/10.1057/s41261-022-00189-1>.

<sup>22</sup> Preethi Vijayagopal, Bhawana Jain, and Shyam Ayinippully Viswanathan, "Regulations and Fintech: A Comparative Study of the Developed and Developing Countries," *Journal of Risk and Financial Management* 17, no. 8 (2024), <https://doi.org/10.3390/jrfm17080324>.

materials, including journal articles and legal dictionaries.<sup>23</sup> The data analysis follows a descriptive approach to deliver complete responses to research problems, strengthening the validity of study findings.

## Digital Economy and Financial Technology Regulation

Information and communication technology advancement fundamentally changes all human activities, including economic operations. The use of information technology as a financial base, known as the digital economy, is a testament to this transformative power.<sup>24</sup> The digital economy, a concept that continues to evolve with advances in information technology, was first introduced in the 1990s.<sup>25</sup> It referred to economic activities supported by information technology based on networks, resulting from the transformation of various financial activities through digitization with the help of computers.

The digital economy has shown a remarkable focus on e-commerce activities in its development. It includes various digitally driven activities, including producing goods and services using information technology.<sup>26</sup> The use of digital technology, which is increasingly pervasive in all aspects of economic activity, underscores the interconnectedness of the digital economy.<sup>27</sup> The digital economy functions as a transformative power that includes all economic activities that depend on technology or show substantial growth because of digital components. Digital technology, infrastructure, services, and data have transformed the financial landscape. The definition emerged from stakeholder consensus, incorporating findings from Bukht and Heeks among other sources.<sup>28</sup>

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<sup>23</sup> Afif Noor, "Socio-Legal Research: Integration of Normative and Empirical Juridical Research in Legal Research," *Jurnal Ilmiah Dunia Hukum* 7, no. 2 (2023): 61–65, <https://doi.org/10.56444/jidh.v7i2.3154>.

<sup>24</sup> Jinqi Su, Ke Su, and Shubin Wang, "Does the Digital Economy Promote Industrial Structural Upgrading?—A Test of Mediating Effects Based on Heterogeneous Technological Innovation," *Sustainability (Switzerland)* 13, no. 18 (2021), <https://doi.org/10.3390/su131810105>.

<sup>25</sup> Wei Zhang et al., "Study on the Effect of Digital Economy on High-Quality Economic Development in China," *PLoS ONE* 16, no. 9 September (2021): 1–27, <https://doi.org/10.1371/journal.pone.0257365>.

<sup>26</sup> Asif Raihan, "A Review of the Potential Opportunities and Challenges of the Digital Economy for Sustainability," *Innovation and Green Development* 3, no. 4 (2024): 100174, <https://doi.org/10.1016/j.igd.2024.100174>.

<sup>27</sup> Ke Rong, "Research Agenda for the Digital Economy," *Journal of Digital Economy* 1, no. 1 (2022): 20–31, <https://doi.org/10.1016/j.jdec.2022.08.004>.

<sup>28</sup> Rumana Bukht and Richard Heeks, "Defining, Conceptualising and Measuring the Digital Economy," *Development Informatics*, 68, 2017, <https://doi.org/10.2139/ssrn.3431732>.

Under this definition, the digital economy is not just about economic activities originating from the digital sector.<sup>29</sup> It is a collaborative ecosystem that includes economic activities supported by the digital sector (digitalized economy) and those that emerge due to the digital sector's existence (digital economy). At its core, the digital economy functions through hyperconnection, which describes the rising web-based connections between people, machines, and organizations.<sup>30</sup>

To explain the definition of the digital economy, Javaid et al. stated that the digital economy is an economic activity facilitated by digital technology that connects individuals and businesses and uses devices, data, and operations.<sup>31</sup> The digital economy encompasses all economic and commercial activities using digital technology and electronic communications, including e-commerce, digital marketing, financial services, software and cloud services, and digital content production.<sup>32</sup>

Jiao and Sun state that the main feature of the digital economy is the widespread use of innovative technologies in actual economic activities.<sup>33</sup> The use of technology in these economic activities is not only in the production process but also in the consumption process of goods and services.<sup>34</sup> The digital economy has several key characteristics: mobility, data dependence, network effects, and volatility (the rapid and unpredictable changes in the digital economy).<sup>35</sup>

The mobility of the digital economy is demonstrated using intangible assets, remote users, and flexible business operations that are no longer tied to physical locations. This mobility makes the digital economy highly dependent on big data, which can provide

<sup>29</sup> Luyanda Dube Williams, "Concepts of Digital Economy and Industry 4.0 in Intelligent and Information Systems," *International Journal of Intelligent Networks* 2, no. September (2021): 122–29, <https://doi.org/10.1016/j.ijin.2021.09.002>.

<sup>30</sup> Abdulkarim A. Oloyede et al., "Measuring the Impact of the Digital Economy in Developing Countries: A Systematic Review and Meta- Analysis," *Heliyon* 9, no. 7 (2023): e17654, <https://doi.org/10.1016/j.heliyon.2023.e17654>.

<sup>31</sup> Mohd Javaid et al., "Digital Economy to Improve the Culture of Industry 4.0: A Study on Features, Implementation and Challenges," *Green Technologies and Sustainability* 2, no. 2 (2024): 100083, <https://doi.org/10.1016/j.grets.2024.100083>.

<sup>32</sup> Lei Xia, S. Baghaie, and S. Mohammad Sajadi, "The Digital Economy: Challenges and Opportunities in the New Era of Technology and Electronic Communications," *Ain Shams Engineering Journal* 15, no. 2 (2024): 102411, <https://doi.org/10.1016/j.asej.2023.102411>.

<sup>33</sup> Shuaitao Jiao and Qiubi Sun, "Digital Economic Development and Its Impact on Economic Growth in China: Research Based on the Perspective of Sustainability," *Sustainability (Switzerland)* 13, no. 18 (2021), <https://doi.org/10.3390/su131810245>.

<sup>34</sup> Stanisław Łobejko and Krzysztof Bartczak, "The Role of Digital Technology Platforms in the Context of Changes in Consumption and Production Patterns," *Sustainability (Switzerland)* 13, no. 15 (2021): 1–15, <https://doi.org/10.3390/su13158294>.

<sup>35</sup> Georgios I. Zekos, *Economics and Law of Artificial Intelligence, Economics and Law of Artificial Intelligence*, 2021, <https://doi.org/10.1007/978-3-030-64254-9>.



fast and accurate analysis in making decisions, understanding consumer behavior, operational efficiency, and creating product and service innovations. Big data can also detect fraud and strengthen the security of digital systems.<sup>36</sup> The fundamental basis of digital transformation and economic growth relies on big data.<sup>37</sup>

The digital economy features network effects from user participation and multi-sided business models operating across multiple jurisdictions, often producing monopolistic or oligopolistic tendencies.<sup>38</sup> These factors contribute to the volatility of the digital economy, which is primarily driven by rapid and constant technological change, unestablished regulation, reliance on big data and algorithms, and market sentiment that is highly responsive to information that develops in the economic society.<sup>39</sup>

Based on the characteristics of the digital economy, economic actors must have strong adaptive and risk mitigation strategies to deal with these rapid and unpredictable dynamics. This adaptive strategy refers to the ability of digital economy players to take fast, precise, and flexible actions in response to external economic dynamics. This adaptability can be achieved, among others, through technology, which improves service efficiency and fosters an innovative work culture. In practical terms, adaptive business actors will be better prepared for changes in the business and economic ecosystem, take advantage of potential opportunities, and avoid the negative impact of technological disruption.

However, adaptation alone in dealing with the volatility of the digital economy is not enough because rapid economic activity changes can also potentially increase legal, financial, and technological risks. Digital economy players must develop a reliable and adequate risk mitigation system.<sup>40</sup> The risk includes market volatility alongside data security threats, cyberattacks, and ambiguous or conflicting regulatory frameworks. To establish a protected digital environment, digital economy players must

<sup>36</sup> Idrawahyuni et al., "Role of Big Data Technology and Whistleblowing System in Distribution of Fraud Detection," *Journal of Distribution Science* 22, no. 9 (2024): 1–12, <https://doi.org/10.15722/jds.22.09.202409.1>.

<sup>37</sup> Panagiotis Kostakis and Antonios Kargas, "Big-Data Management: A Driver for Digital Transformation?," *Information (Switzerland)* 12, no. 10 (2021), <https://doi.org/10.3390/info12100411>.

<sup>38</sup> Andreas Heinemann, "From Two-Sided Networks to Digital Ecosystems : The Economics of Platform Markets," in *Competition Law Issues in the Platform Economy: Comparative Commercial and Economic Law*, 2024, <https://doi.org/10.5167/uzh-270191>.

<sup>39</sup> Milena Vučinić and Radoica Luburić, "Artificial Intelligence, Fintech and Challenges to Central Banks," *Journal of Central Banking Theory and Practice* 13, no. 3 (2024): 5–42, <https://doi.org/10.2478/jcbtp-2024-0021>.

<sup>40</sup> Bob Ritchie and Clare Brindley, "Risk Management in the Digital Economy," *Encyclopedia of Information Science and Technology, Second Edition*, no. March (2011): 3298–3305, <https://doi.org/10.4018/978-1-60566-026-4.ch525>.

establish rigorous data security policies, develop threat detection systems, and create backup plans for system failures and digital operations.

The digital economy requires strong regulatory frameworks to progress in the global economic shift.<sup>41</sup> The implementation of these regulations depends on government officials, policymakers, and industry leaders. Their responsibilities include overseeing the implementation of these regulations to ensure technological innovation in economic activities proceeds without compromising financial stability or disregarding consumer protection. At least six main foundations exist to develop the digital economy amid the global economy:<sup>42</sup>

1. Infrastructure: The digital divide requires an expansion of equitable high-speed internet networks that are reliable and affordable to serve as a beacon of hope. The initiative will drive digital transformation while promoting technology adoption across different sectors and boost digital economy competitiveness.
2. Human Resources: Developing superior human resources through an inclusive and quality education system is crucial to face the challenges of the digital era. A relevant curriculum, combined with digital skills training and strong collaboration between education and industry, will foster an adaptive and highly competent workforce.
3. Business Climate and Cybersecurity: Developing a competitive business ecosystem through digital technology optimization requires strategic planning.<sup>43</sup> Implementing digital marketing strategies and data analytics for valuable business insights and process automation form part of this approach. Protecting digital innovations through cybersecurity measures is equally important because it safeguards their integrity and ensures stakeholder safety.
4. Research, Innovation, and Business Development: Cultivate exceptional research and development capabilities in strategic areas to accelerate digital transformation and inspire and foster a culture of innovation.
5. Funding and Investment: Provide an attractive funding

<sup>41</sup> Serhii Matiukh et al., "State Regulation of the Development of the Digital Economy Infrastructure," *Cuestiones Políticas* 40, no. 73 (2022): 713–25, <https://doi.org/10.46398/cuestpol.4073.40>.

<sup>42</sup> Kementerian Koordinasi Bidang Perekonomian, *Buku Putih Strategi Nasional: Pengembangan Ekonomi Digital Indonesia 2030*, 2023.

<sup>43</sup> Mohan Subramaniam, "Digital Ecosystems and Their Implications for Competitive Strategy," *Journal of Organization Design* 9, no. 1 (2020), <https://doi.org/10.1186/s41469-020-00073-0>.

ecosystem, especially in the information and communication technology sector, and strengthen investment from venture capital.

6. Regulation and Policy: Construct an adaptive, fair, and transparent regulatory and policy framework that can support the development of the digital economy in line with the dynamics of technological innovation, instilling confidence and reassurance in all stakeholders.

The six pillars demonstrate that digital economy development needs more than technology or investment because it requires a complete and integrated approach. Infrastructure development is the base, while human resources play a crucial role in adapting to digital transformation. A healthy business climate and robust protection against cyber threats are essential to instill confidence in the market.<sup>44</sup> Meanwhile, research and innovation accelerate growth, investment supports sustainable financing, and regulation is the legal umbrella that ensures all these processes are balanced and sustainable in the face of global challenges. Effective regulation can help manage risks arising from the adoption of new technologies,<sup>45</sup> such as:

- a. Economic Inequality and Global Monopolies: The digital economy produces winner-takes-all market dynamics because of technological superiority and platform power.<sup>46</sup> The backbone of numerous economies consists of small and medium enterprises (SMEs), yet these businesses face difficulties in competition because they lack equal access to digital tools and infrastructure. The economic gap continues to expand because monopolies control distribution channels and consumer behavior, damaging fair competition and long-term innovation. Establishing fair, transparent regulations will create equal opportunities for economic participation and protect SMEs from vital importance.<sup>47</sup>
- b. Consumer Protection and Cybersecurity: Digital transactions have expanded financial and non-financial services, but also

<sup>44</sup> Beatrice Oyinkansola Adelakun et al., "Legal Frameworks and Tax Compliance in the Digital Economy: A Finance Perspective," *International Journal of Advanced Economics* 6, no. 3 (2024): 26–35, <https://doi.org/10.51594/ijae.v6i3.900>.

<sup>45</sup> Franklin Allen, Xian Gu, and Julapa Jagtiani, "Fintech, Cryptocurrencies, and CBDC: Financial Structural Transformation in China," *Journal of International Money and Finance* 124 (2022), <https://doi.org/10.1016/j.jimonfin.2022.102625>.

<sup>46</sup> Eirik Sjøholm Knudsen et al., "Stability in Turbulent Times? The Effect of Digitalization on the Sustainability of Competitive Advantage," *Journal of Business Research* 128, no. October 2019 (2021): 360–69, <https://doi.org/10.1016/j.jbusres.2021.02.008>.

<sup>47</sup> Shai Fernández and Ulf Bodin, "On the Interplay Between Behavior Dynamics, Environmental Impacts, and Fairness in the Digitalized Circular Economy with Associated Business Models and Supply Chain Management," *Sustainability* 2025, 17, no. 8 (2025).

bring risks such as data breaches, fraud, and cybercrime. As technology advances, strong regulations are essential to protect consumer rights, ensure data security, and empower regulators with practical digital surveillance tools, such as AI-based fraud detection systems and blockchain, for secure transactions to prevent misuse and build trust.

- c. Preserving Economic Sovereignty: Economic sovereignty preservation requires nations to maintain control over their data and economic systems because global digital platforms follow foreign laws. A country loses its power to create economic policies because of its dependence on foreign entities. National economic sovereignty requires strong domestic regulations, which include data localization laws and taxation rules for digital services to protect domestic interests.
- d. Meeting Global Governance Demands: The digital economy's borderless nature shows how countries lack consistent regulatory frameworks. The OECD (Organisation for Economic Co-operation and Development) works to establish standardized digital governance, which provides significant advantages to its member countries.<sup>48</sup> National regulations help countries gain better leverage in international negotiations while maintaining long-term participation in the worldwide digital economy.

The existence of regulations in the digital economy is expected to be the primary reference in developing an equitable, inclusive, positive, and sustainable digital economy ecosystem amid globalization.<sup>49</sup> An integrated digital economy on an international scale requires a balance in technology access, protecting the market image from monopoly, and adequate protection for consumers and small businesses. Rusu and Oprean-Stan, in their study, stated that digitalization accompanied by sustainability policies contributed positively to inclusive growth in European countries.<sup>50</sup> In this context, Rusu and Oprean-Stan highlight that pro-digital transformation policies enhance economic inclusiveness and boost national

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<sup>48</sup> OECD, *OECD Digital Education Outlook 2023: Towards an Effective Digital Education Ecosystem*, OECD Digital Education Outlook, 2023, [https://www.oecd-ilibrary.org/education/oecd-digital-education-outlook-2023\\_c74f03de-en](https://www.oecd-ilibrary.org/education/oecd-digital-education-outlook-2023_c74f03de-en).

<sup>49</sup> Samar Alzamel, "Building a Resilient Digital Entrepreneurship Landscape: The Importance of Ecosystems, Decent Work, and Socioeconomic Dynamics," *Sustainability* 16, no. 17 (2024): 7605, <https://doi.org/10.3390/su16177605>.

<sup>50</sup> Radu Rusu and Camelia Oprean-Stan, "The Impact of Digitalisation and Sustainability on Inclusiveness: Inclusive Growth Determinants," *Economic Computation and Economic Cybernetics Studies and Research* 57, no. 4 (2023): 209–24, <https://doi.org/10.24818/18423264/57.4.23.13>.

economic growth, creating a positive outlook for the digital economy's potential.

National economic growth, driven by an integrated technology ecosystem in the digital economy, such as fintech, necessitates strict yet innovative and dynamic regulation. Ensuring assurance to service users is crucial for fostering the creation of an inclusive and sustainable contactless economy. Products like peer-to-peer (P2P) lending, securities crowdfunding, advisory bots (robo-advisors), and cryptocurrencies urgently need such regulation.<sup>51</sup> The traditional statism of the legal system is no longer viable. A consequential and systematic approach is required to keep pace with technological developments dynamically and sustainably. Adaptivity in this context does not mean compromising the legal principles of protection but rather strengthening them through a more flexible approach oriented towards certainty, justice, and protection of the general public's rights.

The characteristics of fintech as a service are that it has the advantages of accessibility and high efficiency, resulting in new risks that the regulation cannot accommodate. In this case, data misuse, digital identity destruction, and unfair business practices need to be regulated by fintech law. As users, consumers have rights such as information underlying the calculation, and the conflict resolution system must be adequate. Therefore, fintech regulation must be "agile regulation" without eliminating the function of control and balance.<sup>52</sup> Law and justice, with their adaptability, must be able to reassure the audience about the resilience of the regulatory system to the development of technology and business models.

The absence or weakness of regulation can create legal uncertainty that stifles innovation, weakens public trust, and risks increasing inequality in access to finance. Therefore, government regulation, in this case, is crucial. It ensures inclusiveness and public trust and can act as a facilitator or director of the rise of social fund technology if it maintains the principles of inclusiveness, safety, and social justice. Risk-based responsiveness is regulated for public innovation; otherwise, it is to protect public interests. Both are useful for building a digital economic system that is technically, socially, and legally integrated.

Through the lens of Indonesian positive law, regulatory

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<sup>51</sup> Moran Ofir and Sadeh Ido, "More Of The Same Or Real Transformation: Does Fintech Warrant New Regulations?," *Perspective Technologies and Methods in MEMS Design (MEMSTECH)*, 2011 *Proceedings of VIIth International Conference On*, no. May (2011): 124–26.

<sup>52</sup> Dirk A. Zetsche, Douglas W. Arner, and Ross P. Buckley, "Decentralized Finance," *Journal of Financial Regulation* 6, no. 2 (2020): 172–203, <https://doi.org/10.1093/jfr/fjaa010>.

responses emerge through legal statutes and technical rules from responsible authorities to advance digital economic and fintech sector development.<sup>53</sup> The regulations function as social management instruments to implement transparency measures and create accountable oversight systems for fintech operations.<sup>54</sup> Legal clarity is the primary protection against systemic risk because it maintains public trust in financial technology and its security.<sup>55</sup> The following section will describe some regulations related to the digital economy.

#### 1. Law Number 36 of 1999 on Telecommunications.

Law Number 36 of 1999 on Telecommunications is a significant milestone in Indonesia's communication sector regulation history. This law serves as the base legislation that enables the development of the national digital infrastructure. The law introduced foreign and private sector involvement to telecommunications and established new regulations that ended state control and encouraged market competition. Through its focus on competition, the law demonstrates its dedication to providing high-quality services and innovation, resulting in better service quality, enhanced internet access, and expanded digital services throughout society.

The first comprehensive legislation in this sector enabled internet infrastructure expansion, accelerating digital transformation across strategic fields, including fintech, e-commerce, edtech, and online public services. Articles 1 (telecommunications network and service definitions), Article 4 (telecommunications welfare creation), and Articles 7 and 9 (business openness and interconnection) provide the structural framework for modern digital economic operations. According to Article 11, the licensing system functions as a governmental instrument to maintain technical standards and service quality and protect consumers. The law enabled the substantial expansion of digital MSMEs and the digital transformation of public services and educational institutions.

The rapid advancement of IoT, AI, and blockchain technologies demands immediate regulatory establishment from authorities.<sup>56</sup>

<sup>53</sup> Saifullah et al., *The Evaluation of the Indonesian Fintech Law From the Perspective of Regulatory Technology Paradigms To Mitigate Illegal Fintech*, *Jurisdictie: Jurnal Hukum Dan Syariah*, vol. 14, 2023, <https://doi.org/10.18860/j.v14i2.24025>.

<sup>54</sup> Vivi Sylvia Purborini, Ida Bagus Suryanatha, and Kasmin, "Hukum Dan Ekonomi Digital : Regulasi Fintech Di Indonesia," *-CEKI : Jurnal Cendekia Ilmiah* 4, no. 3 (2025): 956–64.

<sup>55</sup> Afif Noor et al., "Maslahah -Based Protection of Fund Recipients in Fintech Lending Through Empowerment and Justice," *El-Mashlahah* 15, no. 1 (2025): 1–20, <https://doi.org/10.23971/el-mashlahah.v15i1.7786>.

<sup>56</sup> Cornelius Kalenzi, "Artificial Intelligence and Blockchain: How Should Emerging Technologies Be Governed?," *Frontiers in Research Metrics and Analytics* 7, no. February (2022): 1–14,

The revision of this law and its inclusion in Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector need both strategic and immediate action. The law must remain relevant for the present digital landscape and future developments, thus requiring immediate action.

2. Law Number 11 of 2008, last amended by Law Number 1 of 2024 on Electronic Information and Transactions.

The Electronic Information and Transactions Act of 2008 established Law Number 11 of 2008 as a fundamental piece of Indonesian digital legal structure, providing legal clarity to electronic transactions. Since its passage, the law has served as a vital foundation that enables the digital economy's growth, particularly in the fintech sector.<sup>57</sup> Internet growth and digital innovation received validation through the law, which established legitimacy for electronic transactions while building public confidence in online financial services and digital platforms.

Article 5 of the law confirms that electronic documents and their printed versions possess a valid legal evidence status. Article 6 of the law gives electronic documents the same legal power as physical documents when they fulfill the requirements of accessibility and integrity standards. The standards require systems to protect digital records from modification attempts while guaranteeing users can access and understand them properly. Fintech companies require digital records to establish contracts and user agreements and process financial transactions, so these standards are crucial. Article 11 of the law stresses the importance of authenticating and maintaining the integrity of electronic signatures, which prove user identities while protecting financial service data.

The ITE Law protects digital financial systems from cybercrime through Articles 27 to 30, establishing legal frameworks to combat hacking, data breaches, and online fraud. Law Number 1 of 2024 represents significant development through enhanced personal data protection measures, improved identity verification systems, and digital content monitoring capabilities. The updated regulations match modern technology standards while ensuring users receive digital transaction security, reliability guarantees, and legal compliance assurance. The ITE Law establishes a secure digital environment, enabling Indonesia to develop its fintech industry in

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<https://doi.org/10.3389/frma.2022.801549>.

<sup>57</sup> Bayu Dwi Anggono et al., "Interrogating the Legal Foundations of Digital Transformation: Balancing Economic Growth and Social Welfare in the Era of Disruption," *Volkgeist: Jurnal Ilmu Hukum Dan Konstitusi* 8, no. 1 (2025): 191–211, <https://doi.org/10.24090/volkgeist.v8i1.12211>.

the long term.

### 3. Law Number 4 of 2023 on Financial Sector Development and Strengthening (PPSK)

The PPSK Law is a significant regulatory change that modernizes and strengthens Indonesia's financial system through digital age requirements. The new legislation replaces previous rules while addressing the fast-paced growth of digital finance, including fintech and crypto assets, and technological progress. According to Article 216 (1) of the PPSK Law, the Financial Services Authority (OJK) gains expanded regulatory authority. The OJK must regulate and supervise all financial technology innovation, which includes digital financial services and assets, according to Article 216 (1). OJK is the primary regulatory agency that enforces compliance standards while promoting responsible, innovative practices that uphold principles of transparency and responsibility.

The OJK also took complete control of digital financial assets, including cryptocurrencies, through Article 312 (effective January 2025) after Bappebti lost its authority. This consolidation will develop a unified regulatory system to improve consumer protection standards and legal precision. The PPSK Law functions as a vital instrument to manage risks that stem from unclear regulations and data exploitation, along with immoral debt collection methods, including harassing behaviors through frequent contact and offensive language.

The law requires clear digital contracts, public education, effective dispute resolution, and transparency to protect consumers.<sup>58</sup> The regulatory sandbox under the law provides fintech companies with a safe environment to conduct innovation tests. Bank of Indonesia supports OJK's work by supervising payment systems and digital rupiah development. The payment system oversight function of the Bank of Indonesia enables smooth digital financial service operations while its digital rupiah development matches the national digital economy targets. The implemented reforms have created an extensive legal framework that will lead Indonesia toward building a secure digital financial system that promotes both competition and inclusivity.

### 4. Government Regulation Number 71/2019 on Implementing Electronic Systems and Transactions.

The government of Indonesia established, through Government Regulation No. 71 of 2019 (PP No. 71 of 2019), a fundamental

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<sup>58</sup> Dmytro Zahorodnii, Olena Nadiienko, and Olena Artemenko, "Civil-Law Regulation of Electronic Contracts: Current Challenges in Marketing and the Digital Economy," *Legal Horizons* 25, no. 25 (2025): 35–46, <https://doi.org/10.54477/10.54477/lh.25192353.2025.2.pp.35-46>.



framework for electronic transactions and data security that drives the digital economy forward. The ITE Law is the basis for the new regulation to maintain a legal structure supporting the quick expansion of digital finance and fintech development. PP No. 71 of 2019 functions as a key framework for the fintech industry by establishing rules for Electronic System Providers (ESPs), which comprise private companies, public institutions, and fintech services.

ESPs under this regulation must maintain secure, reliable, and accountable systems because fintech companies need to protect sensitive financial data. Data protection measures provide complete security to users while maintaining the total integrity of the digital economic system. Under PP No. 71 of 2019, personal data protection is a priority. Under this regulation, ESPs must obtain user consent before data processing and protect user data by ensuring confidentiality, integrity, and availability. The digital era's risk of personal data exposure, particularly financial information, makes these requirements essential for protecting personal data security and digital transaction integrity. This makes stakeholders feel secure with their digital transactions.<sup>59</sup>

Under the new regulation, private ESPs can store data abroad, but the Indonesian government maintains access to this data whenever required. The classification system established by PP No. 71 of 2019 divides ESPs into public and private sectors while imposing stronger regulatory requirements on private companies that handle sensitive financial information. The government maintains the authority to perform system audits of ESPs and enforce sanctions when ESPs fail to comply with regulations. The regulation features enforcement mechanisms to enhance compliance, including fines, license suspension, and possible license revocation. The legal framework established by PP No. 71 of 2019 provides Indonesia with national security and worldwide operational freedom in its digital economy. The regulation strikes a fair balance between supporting the local digital economy and considering global stakeholder needs, creating an inclusive environment.

#### 5. Financial Services Authority Regulation No. 13/POJK.02/2018 on Digital Financial Innovation in the Financial Services Sector

POJK No. 13/POJK.02/2018 from the Financial Services Authority sets crucial guidelines to establish Indonesia's digital

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<sup>59</sup> Nikhil Ghadge, "Optimizing Identity Management: Key Strategies For Effective Governance And Administration," *International Journal of Security, Privacy and Trust Management (IJSPTM)* 13, no. 3 (2024): 1–11, <https://doi.org/10.5121/ijspmt.2024.13301>.

financial service framework for the future. This regulation enables the financial system to adopt digital innovations at a rapid pace through its complete framework. The regulation supports financial sector stability, consumer protection, and innovation development to create advantages for the industry and its customers. POJK No. 13/POJK.02/2018 includes a regulatory sandbox as one of its main provisions. Through this forward-thinking approach, fintech companies get permission from the OJK to conduct tests of their products and services. At the same time, the OJK supervises them in discovering potential risks before the general market introduction.

The financial system and consumer welfare need protection, while innovation should continue to thrive. The regulation prioritizes consumer protection through measures emphasizing transparency, transaction security, and dispute resolution methods.<sup>60</sup> The established provisions create security for digital financial service users who can feel confident about operational standards and secure transactions. The regulation demonstrates strong risk management principles through its requirement for providers to establish powerful data security systems that protect personal and financial information, thus building consumer trust.

The financial system stability comes from POJK No. 13/POJK.02/2018 implementing digital financial innovations. This approach supports fintech development in a controlled environment through its pre-launch market impact assessments, which enable the industry's growth. The industry's development benefits from this approach, prioritizing consumer protection and financial system security.

#### 6. Financial Services Authority Regulation Number 40/2024 on Implementing Information Technology-Based Joint Funding Services.

In its rapid expansion, the digital finance industry has seen the emergence of fintech lending, also known as Information Technology-Based Joint Funding Services, to link lenders with borrowers through online platforms.<sup>61</sup> The Financial Services Authority (OJK) issued OJK Regulation (POJK) No. 40 of 2024 to establish legal clarity, protect consumers, and enhance transparency

<sup>60</sup> Rashmi Mishra and Deepika Varshney, "Consumer Protection Frameworks by Enhancing Market Fairness, Accountability and Transparency (FAT) for Ethical Consumer Decision-Making: Integrating Circular Economy Principles and Digital Transformation in Global Consumer Markets," *Asian Journal of Education and Social Studies* 50, no. 7 (2024): 640–52, <https://doi.org/10.9734/ajess/2024/v50i71494>.

<sup>61</sup> Gustita Arnawati Putri, Ari Kuncara Widagdo, and Doddy Setiawan, "Analysis of Financial Technology Acceptance of Peer to Peer Lending (P2P Lending) Using Extended Technology Acceptance Model (TAM)," *Journal of Open Innovation: Technology, Market, and Complexity* 9, no. 1 (2023): 100027, <https://doi.org/10.1016/j.joitmc.2023.100027>.

in these services. The new regulatory framework updates previous rules to handle digital finance complexities and creates optimism by reducing risks and establishing clear guidelines for the industry.

Article 6, paragraph (2) of POJK No. 40 of 2024 establishes that fintech lending providers must operate as limited liability companies with a minimum paid-up capital of IDR 25 billion. The financial stability requirements and professional standards will draw substantial industry participants who will build stakeholder trust and confidence. The regulation establishes a rigorous licensing system that providers must follow to get OJK approval before starting operations (Articles 4 and 5) to build trust and credibility within the industry.

Risk management receives priority through the regulation, which sets specific boundaries for individual borrowers regarding the total amount of funds they can receive from lenders. Individual lenders can provide funding up to IDR 25 million per borrower, while institutional lenders can extend loans up to IDR 100 million, according to Article 34. Reducing lending limits is a preventive measure to minimize potential risks and defaults, thus providing better security for the audience. The regulation requires precise and accurate disclosure of information about service fees, interest rates, and risks according to Article 19 and data protection standards as per Article 29.

The regulation establishes a safer and more trustworthy fintech lending environment by focusing on ethical debt collection and operational transparency. The regulatory framework creates a solid base to advance Indonesia's digital economic growth. The upcoming direction of digital economy regulation will encounter difficulties due to quick technological advancements, affecting financial sector operations, public services, and commercial activities. The digital economy's fast expansion demands that Indonesia develop legal structures that adapt to technological progress while preserving financial stability and delivering sufficient consumer protection. Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector (PPSK Law) provides essential groundwork for building a risk-based regulatory framework. This framework, which assesses and manages risks in the financial sector, is crucial in promoting innovation while ensuring the sector's sustainability.

Future economic development projections rely on AI regulation creation, which follows the European Union's lead by creating ethical frameworks for AI deployment.<sup>62</sup> The AI sector in Indonesia is set to

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<sup>62</sup> European Union, "Regulation 2024/1689," *Official Journal of the European Union* 1689, no. 3 (2024): 1–144.

expand through public service enhancements, digital finance innovations, technology-based education systems, and data-driven healthcare platforms. Future AI regulations in Indonesia, emphasizing caution alongside fairness and accountability, will create better ethical AI practices and increase societal welfare. The main obstacle lies in keeping innovative spaces open but simultaneously stopping manipulative actions that could endanger public welfare.

The digital economic landscape is at the core of the data-driven economy structure. Data now serves as the "new oil" that establishes a nation's financial status according to scientific findings.<sup>63</sup> The Indonesian government has established the PDP Law as its fundamental base. The implementation requires more technical regulations from the Government or Ministerial level to develop guidelines for cross-sectoral data exchange and integrated oversight systems. A new policy for industry-government data sharing emerges to enhance public policy operational efficiency and service delivery to consumers. The policy will establish national data sovereignty through mandatory data localization, which requires storing and processing data within Indonesia's legal boundaries.

The regulatory framework will expand its reach toward digital assets and blockchain governance systems. Blockchain technology has proven its value as a fundamental component of worldwide digital economic systems by developing cryptocurrencies, NFTs, and asset tokenization. Bappebti classifies crypto assets as commodities, while the OJK starts regulating financial aspects of blockchain-based investments and payments. The OJK, along with Bappebti, expects to provide more explicit legal definitions for digital assets while potentially creating new legal structures for stablecoins, together with tokenized assets and blockchain implementation in public services such as land certification, state asset recording, and legal document digitization. The PPSK Law enables OJK to extend its supervisory authority toward distributed technology-based financial innovation.

The growth of e-commerce alongside digital marketplaces will lead to new regulations to improve protections for micro, small, and medium enterprises (MSMEs). The difference between major platforms and domestic operators needs fresh regulations to disclose search algorithms, maintain fair paid advertising practices,

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<sup>63</sup> Michele Loi and Paul-Olivier Dehay, "If Data Is The New Oil, When Is The Extraction of Value From Data Unjust?," *Philosophy & Public Issues* 7, no. 2 (2017): 137–78, [www.zora.uzh.ch/year:2017%0Ahttp://ana.blogs.com/maestros/2006/11/data\\_is\\_the\\_new.html](http://ana.blogs.com/maestros/2006/11/data_is_the_new.html).

<sup>64</sup> Chiara Farronato, "Data as the New Oil : Parallels , Challenges , and Regulatory Implications," 2025.

and ensure local products receive priority placement in platform offerings. Fair competition principles and inclusivity will guide policies to defend MSMEs against marginalization within the expanding digital marketplace. The PPSK Law enables consumer protection governance improvement through its Article 298 paragraphs (1) and (2) for technology-based financial activities, including e-commerce with embedded finance features.

Specific regulations regarding immersive technologies like the metaverse will emerge shortly.<sup>65</sup> Virtual economic spaces and educational and social platforms will create new problems for protecting digital works' intellectual property rights and preventing consumer fraud and digital identity theft. The established regulations offer dual benefits to support innovation alongside creating a protected digital environment for all users. Positive law should be expanded by regulatory approaches to address new social and economic interactions that operate without physical locations. The development of metaverse regulations should unite the OJK with the Ministry of Communication and Digital Affairs (Komdigi) and the Ministry of Law through cross-sectoral collaboration from a digital economy perspective.

The development of Indonesia's digital economy heavily depends on fintech, which will need additional comprehensive regulatory frameworks in the future. According to the PPSK Law, OJK must create a regulatory sandbox and perform risk-based supervision of technology-based financial service providers (Article 213 paragraph (1) and Article 215). The regulatory framework will need adaptation to support new business models, which include embedded finance, decentralized finance, and banking-as-a-service. OJK will increase its regulatory sandbox examination to evaluate system readiness and evaluate potential risks alongside consumer protection safeguards for new sectors. The key difficulty for future fintech regulation is maintaining financial inclusion and system stability while stopping illegal activities, including online illicit lending and digital money laundering.<sup>66</sup>

The digital economy sector's rising complexity makes principle-based regulation an increasingly strategic approach compared to traditional rule-based systems. The PPSK Law has indicated this direction by focusing on risk-based supervision frameworks and

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<sup>65</sup> Louis B. Rosenberg, "The Growing Need for Metaverse Regulation," *Lecture Notes in Networks and Systems* 544 LNNS, no. September (2023): 540–47, [https://doi.org/10.1007/978-3-031-16075-2\\_39](https://doi.org/10.1007/978-3-031-16075-2_39).

<sup>66</sup> Dariusz Wójcik, "Financial Geography II: The Impacts of FinTech – Financial Sector and Centres, Regulation and Stability, Inclusion and Governance," *Progress in Human Geography* 45, no. 4 (2021): 878–89, <https://doi.org/10.1177/0309132520959825>.

promoting active engagement between regulators and industry players. The Indonesian government needs to develop adaptable and strong institutions through a better regulator's understanding of technological progress and the integration of agency oversight systems and active public engagement in policy creation.

The Indonesian government will direct its digital economy regulation strategy toward creating an innovation-friendly legal system while maintaining security standards, fairness, and sustainability principles. The PPSK Law establishes a vital basis for developing an inclusive digital financial sector that demonstrates resilience to technological changes. Through its risk-based framework, the regulation establishes an essential system that supports digital financial innovation while focusing on sustainability goals. The fast evolution of technology demands both adaptability and regular updates to regulatory frameworks. Through technology consumption, Indonesia has developed into a globally competitive producer of digital regulations.

## Protection of Consumer Rights in Financial Technology

The digital economy's rise has led to sweeping changes in many spheres, including the financial industry. The development of fintech has provided the ordinary class with greater access to much more inclusive, efficient, and quick financial services. Indeed, new problems have also emerged where progress has been made, notably with consumer protection. Proper regulation is needed to protect the public and the stability of the digital financial ecosystem.<sup>67</sup> That makes conversations on fintech consumer protection regulation even more important as part of Indonesia's overall digital economy governance.

Concerning digital finance, consumer protection is not only an element of the legal system, but an urgent need to protect the financial rights in the economy. Digital finance is a blossoming sector that covers all the economic exchanges performed during the digital era due to the technological intervention provided by fintech. The urgency of consumer protection is paramount to maintain public trust and ensure their transactions are conducted within a fair, secure, and transparent digital system.

The general notion of consumer protection is defined in Law

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<sup>67</sup> Milena Vučinić, "Fintech and Financial Stability Potential Influence of FinTech on Financial Stability, Risks and Benefits," *Journal of Central Banking Theory and Practice* 9, no. 2 (2020): 43–66, <https://doi.org/10.2478/jcbtp-2020-0013>.

Number 8/1999 concerning Consumer Protection. A consumer is considered one who purchases the goods and services available in society for use by people (for personal, family, other individuals, or other living beings), not for resale. This law follows the general consumer protection principles and applies to digital services, including digital finance. These rights include the right to provision of products/services that are safe, secure, and cause no discomfort; but also services/products free from misleading information (such as false advertising or hidden fees), accurate information (such as clear and understandable terms and conditions), transparent when it comes to information quality; there is a right to choose and acquire the promised goods/services according to fair exchange values featured by correct price bundling choice offering practices; followed by the long claimed -it gets physiological- notion concerning complaints or seeking dispute resolution.

In digital finance, the above principles are applied more strongly because of the high risks - possible malpractices in handling personal data, digital fraud (which includes but is not limited to identity theft, phishing, and other forms of online deception), small user understanding of the mechanism's services work, or information asymmetries between service providers and consumers. The models of digital finance are typically not iterative, and law lacks elastic, results-driven regulation winnowed into adaptive, risk-based mechanisms. Consumer protection principles in the digital context are also key to global norms such as the Organisation for Economic Co-operation and Development (OECD) Guidelines for Consumer Protection in E-Commerce.<sup>68</sup> This is needed so that Indonesia's digital economy can align with the world and highlight international trade and cooperation. The rules focus on transparency, fair contract terms, access to effective dispute resolution mechanisms, and personal data protection.

From a technical standpoint, the legal landscape governing consumer protection in financial technology is underpinned by a comprehensive array of legislative acts. These contain the Law Number 8 of 1999 on Consumer Protection, Legislation Number 11 of 2008, as changed by Law Number 1 of 2024 about Electronic Information and Transactions (ITE Law), Law Number 27 of 2022 about Personal Data Protection, and miscellaneous implementing provisions. The holistic approach gives the consumer protection regulation in the fintech segment a robust backbone.

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<sup>68</sup> OECD, "Guidelines for Consumer Protection in the Context of Electronic Commerce," *Guidelines for Consumer Protection in the Context of Electronic Commerce*, 2000, <https://doi.org/10.1787/9789264081109-en-fr>.

### 1. Law Number 8 of 1999 on Consumer Protection

In Indonesia, Law Number 8 of 1999 on Consumer Protection, or CP Law, is a major guiding legal framework for protecting consumer rights, including those of the fintech industry. Though the law was adopted earlier than digital technologies came into the world, its essence of consumer protection is still valid. It can be applied to transactions realized through fintech platforms' channels. In this regard, the CP Law has legal definitions that protect fintech consumers against possible misuse, fraud, or ambiguity in online dealings.

Among the most significant principles secured by the CP Law, the consumer's right to feel safe and secure using services and goods, including digital-based ones, should be mentioned. A consumer's right to comfort, security, and safety when gaining access to the service is established in Article 4 of the CP Law and is available to the fintech services, including online lending, digital wallets, and investment platforms. Identity theft, online loans that exploit people, or even harassment by other careless service providers are the most common examples of risks that consumers face in the fintech environment. Hence, this article grants consumers the right to demand protection against such risks.

Moreover, it is of great essence that the consumer has the right to get honest, transparent, and veracious information in the fintech industry.<sup>69</sup> Most fintech services do not give sufficient information about the terms and conditions of their products, including interest rates, other fees, or possible risks of their investments. The CP Law has been mentioned in Article 4 (2), which holds the right to transparent information on goods or services a consumer opts for. Fintech providers are bound to share full and valid details regarding their services and products, including any implications, hidden costs, etc.

The CP Law also controls the moral conduct of the business actors in terms of giving truthful and authentic information to consumers. Article 7 confirms the responsibility of business actors, including fintech providers, to provide clear and accurate information regarding the products they offer and ensure that the quality and performance of the products are clear. When a fintech provider cannot keep up this responsibility and provide adequate and correct information, the company can face sanctions according to the law. This will ensure that the consumers do not incur losses

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<sup>69</sup> Taewoo Roh et al., *What Makes Consumers Trust and Adopt Fintech? An Empirical Investigation in China*, *Electronic Commerce Research*, vol. 24 (Springer US, 2024), <https://doi.org/10.1007/s10660-021-09527-3>.



because of misrepresentation or lack of transparency in the information they receive.

In addition, fintech providers cannot evade responsibility in case of losses incurred by the consumer due to poor service compared to the promised performance. The CP Law (Article 19) gives consumers the right to recover damages sustained in harmful transactions. To illustrate, consumers deceived by a fintech lending application that does not reveal the entire specifications of interest rates and charges have been covered with the help of the CP Law. In these cases, consumers demand a refund or compensation due to this provision.

Still, notwithstanding the CP Law's unambiguous rights given to consumers, the fintech business suffers greatly regarding adequate legal provision and control over unauthorized service providers. Numerous illegal fintech services lack registration and licensing with the OJK, the central regulatory authority in Indonesia for financial services, which plays a crucial role in ensuring the safety and security of financial transactions in the digital era.<sup>70</sup> This tends to make the consumers either victims of fraud or economic losses. A problem might also arise with consumers who engage in a dispute with an unregistered fintech seller or provider and find it hard to resolve the dispute fairly.

The CP Law also regulates dispute resolution between consumers and business actors, allowing consumers to file complaints and seek resolution through consumer dispute resolution bodies or the courts. Article 45 of the CP Law gives consumers the right to claim compensation or seek settlement through mediation or arbitration. In the fintech context, this mechanism can be applied when a consumer is harmed by a service provider that fails to comply with legal standards. Nevertheless, having access to the method of dispute resolution is usually hindered by low levels of awareness among people regarding their rights or mechanisms of complaints.

In addition, the CP Law also contains sanctions for business actors who violate the rules of law. Under Article 62 of the CP Law, business actors who commit fraud or actions that harm consumers (e.g, misleading advertising, deceptive pricing/capping price, not informing important matters) may be subject to criminal penalties; In the context of fintech, any service that does not comply with rules and regulations can be fined or jailed. For example, a CP Law

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<sup>70</sup> Ryan Randy Suryono, Indra Budi, and Betty Purwandari, "Detection of Fintech P2P Lending Issues in Indonesia," *Heliyon* 7, no. 4 (2021): e06782, <https://doi.org/10.1016/j.heliyon.2021.e06782>.

criminal penalty for an online lending platform that did not disclose interest rates or other fees, causing consumer losses.

While the CP Law provides a robust legal basis for consumer protection, several challenges must be overcome if the provisions are effectively applied within fintech. The absence of a dedicated regulatory framework to protect personal data, which assumes massive importance in digital transactions, is one big area that lacks political consensus.<sup>71</sup> Fintech services are all about consumer data, but their privacy cannot be well-regulated by the CP Law. Hence, improved rules and regulations are needed to protect consumer data in fintech. Another problem is the policing of non-compliant or unlicensed fintech players. Even though the OJK has tried to regulate and supervise the fintech services, most go without regulation, predisposing consumers to fraud and exploitation. Thus, there seem to be more rigid and formalized regulations to ensure that any fintech players operating in Indonesia are duly registered.

## 2. Law Number 11 of 2008, as Last Amended by Law Number 1 of 2024 concerning Electronic Information and Transactions

Law Number 11 of 2008 on Electronic Information and Transactions (known as the ITE Law), as amended by Law Number 1 of 2024, serves as one of the primary legal instruments governing activities in the digital space, including technology-based economic and financial transactions or fintech. By providing legal shifts not explicitly enumerated by Law Number 8 of 1999 on Consumer Protection, ITE Law provides a legal framework in consumer protection, especially the security of digital transactions and personal data protection. It is particularly essential to reinforce this legal base connected with the skyrocketing pace of development of the digital economy and the rise in the number of people who utilize fintech services.

The ITE Law sets a regulation for how valid and legal electronic transactions are, putting trust in all digital platforms and securing the rights of digital consumers. They include provisions to protect consumers, requiring business actors and traders to provide accurate information, a complete electronic agreement (e-signature), a privacy policy, and personal data protection. The fundamentals and philosophies of this bill can already be seen in Act No 8/1999 on Consumer Protection. Article 9 of ITE Law is one of the provisions under the set of articles that represent consumer protection, which states that business actors selling product or service by using

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<sup>71</sup> Rahmi Ayunda, "Personal Data Protection to E-Commerce Consumer: What Are the Legal Challenges and Certainties?," *Law Reform: Jurnal Pembaharuan Hukum* 18, no. 2 (2022): 144–63, <https://doi.org/10.14710/lr.v18i2.43307>.

electronic system must give complete and accurate information related to term of contract, price, specification of product/service and potential risk as a result from consumption/utilization of the product/service. In the case of financial technology, providers of online loans, digital wallets, app-based investments, and other services must disclose all terms - even down to hidden fees, interest rates, risks of losing money, and how to cancel. This duty ensures buyers have as many necessary facts as possible to make well-informed decisions, so they are not deceived by misinformation. Civil and criminal sanctions can be applied to business actors who fail to meet this obligation.

Articles 11 to 13 of the ITE law discuss digital signature as a legitimate legal instrument for confirming the legal precedence of a transaction over a digital medium. Moreover, these provisions also enforce the legal effects of electronic signatures only if those signatures are processed by complying with the requirements established for authentication and data integrity. Electronic signatures, such as loan agreements, online account openings, and transaction approvals, are frequently used in fintech practices. Although this mechanism ensures high efficiency in electronic transactions, it also poses requirements for business actors to secure the system and maintain signature integrity so that it is not tampered with or abused by untrusted entities from third parties. If fintech providers do not provide adequate assurance over the provenance of e-signatures, consumers may suffer loss with little or no legal protection.

Protecting personal data is one of the most critical issues in the digital ecosystem.<sup>72</sup> Article 26 of the ITE Law provides that using any personal data through electronic media must be based on the data subject's consent. This implies that fintech service providers should not gain access, process, store, or share consumer data without the express or informed consent of the data owner. The violation of this provision might result in criminal penalties, particularly when data misuse can be used commercially, but the data owner is not aware of it. Many fintech consumers have fallen victim to personal data misuse, such as disseminating loan information to third parties, unethical debt collection practices, or financial data leaks leading to fraud. Personal data protection is becoming increasingly important because fintech services rely heavily on user data verification for creditworthiness, user identification, and transaction execution.

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<sup>72</sup> Afif Noor et al., "Overcoming Regulatory Hurdles in the Indonesian Crowdfunding Landscape," *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi* 6, no. 2 (2023): 245–60, <https://doi.org/10.24090/volksgeist.v6i2.9447>.

The ITE Law also strengthens the legal protection framework by providing the basis for evidence and legal action against the misuse of electronic systems. Articles 30 to 32 prohibit unauthorized access to electronic systems and the illegal retrieval of data. In consumer protection, these provisions can be used to prosecute parties who steal consumer data, hack fintech accounts, or use data unlawfully for activities that harm users. Such abuses cause economic losses and erode public trust in the digital ecosystem. Thus, strengthening information security systems is a key responsibility of fintech providers as part of preventive consumer protection efforts.

The ITE Law also regulates the resolution of disputes arising from electronic transactions. Fintech consumers who feel harmed by service providers may file complaints through the mechanisms outlined in the law or opt for electronic dispute resolution (e-dispute resolution). In practice, many disputes are resolved through mediation by fintech associations or under the supervision of the OJK.<sup>73</sup> However, consumers can take their case to court without agreement. This reflects the right to justice and legal protection for consumers in the digital space, as guaranteed by the Constitution and the Consumer Protection Law.

Overall, the ITE Law complements the Consumer Protection Law by providing a more technical and relevant legal foundation for developing electronic transactions. The introduction of the ITE Law ensures that fintech consumers have stronger protection covered under the law in the form of information transparency, security of transactions, and protection of personal data. Also, the character of the law motivates the business actors to embrace responsible and transparent digital governance. It is critical to increase the coverage area and application of the legal bodies in the digital industry to create an environment of security, fairness, and reliability in the fintech industry.

However, the ITE Law does not run smoothly. Among these pitfalls, the low level of digital literacy among the population can also be outlined because it leads to incomplete awareness of consumers' rights and duties when using fintech services. Most consumers fail to read the terms and conditions, sign agreements without sufficient knowledge, or do not report breaches of contract because of a lack of awareness of remedy procedures. Thus, the digital consumer protection should not be based only on the

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<sup>73</sup> Dona Budi Kharisma and Nadzya Tanazal E.Ar, "Online Dispute Resolution as an Alternative Model for Dispute Settlement in The Financial Technology Sector," *Pandecta Research Law Journal* 17, no. 1 (2022): 137–45, <https://doi.org/10.15294/pandecta.v17i1.25267>.

regulations but also on the informative campaigns and reinforcement of controlling bodies.

Enhancing consumer protection in the fintech sector also requires collaboration among relevant institutions, including the OJK, Bank of Indonesia, the Ministry of Communication and Digital, and consumer protection agencies. OJK, being the primary regulator in the financial services industry, has a significant role in the execution of the ITE Law within the fintech community. It is responsible for monitoring the conformity of fintech providers to consumer protection provisions, protecting the safety of electronic transactions, and the arbitration of complaints between consumers and service providers. Implementing the ITE Law must be supported by inter-agency data integration, efficient violation reporting systems, and strict sanctions for business actors who do not comply with consumer protection principles. In the long run, the success of digital consumer protection will determine how much the public is willing to embrace financial technology in daily life and national economic development.<sup>74</sup>

The ITE Law generally regulates electronic information and transactions and is a critical foundation for consumer protection in the digital economy era. This statute assures transaction validity, transparency in the services, and security of privacy and rights of consumers in the fintech industry. Nevertheless, the ITE Law can also significantly affect the development of the fintech industry. The ITE Law can create confidence within the digital economy by stipulating clear standards for electronic transactions, ensuring the fairness of services, protecting consumer rights, and promoting the responsible and sustainable development of the fintech market. Through consistent implementation and robust supervision, the ITE Law can become a cornerstone for building public trust in a secure and just digital technology environment.

### 3. Financial Services Authority Regulation Number 6/POJK.07/2022 on Consumer and Public Protection in the Financial Services Sector

The Financial Services Authority Regulation (POJK) No. 6/POJK.07/2022 on Consumer and Public Protection in the Financial Services Sector is a significant development in the industry. It serves as the main legal framework governing the protection of consumer rights, including fintech services. This regulation replaces POJK No. 1/POJK.07/2013, strengthens the consumer protection

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<sup>74</sup> Sagir Danladi et al., "Attaining Sustainable Development Goals through Financial Inclusion: Exploring Collaborative Approaches to Fintech Adoption in Developing Economies," *Sustainability (Switzerland)* 15, no. 17 (2023): 1–14, <https://doi.org/10.3390/su151713039>.

framework with a more responsive approach to digital challenges while emphasizing financial literacy and inclusion.

One of the key foundations of this regulation is Article 2, which states that the goal of consumer and public protection is to create a sustainable and stable financial services sector supported by public trust through fair, transparent, and responsible protection. This is particularly important in fintech services due to the digital ecosystem's vulnerability to data misuse, fraud, and misinformation.<sup>75</sup>

Articles 3 and 4 reinforce the principles of consumer protection. Article 3 outlines that these principles include transparency, fair treatment, reliability, confidentiality, security of consumers' personal data/information, and dispute resolution. Article 4 mandates that financial service providers implement these principles in all consumer processes and interactions. This applies to fintech players, including peer-to-peer lending, digital investment services, and e-wallets, which must provide clear and understandable product information and robust security systems.

Articles 6 to 9 describe the requirements of financial service providers in providing accurate, truthful, and non-misleading information. According to Article 6, financial services providers must provide consumers with all the complete, correct, and available products and product information, such as product characteristics, costs, benefits, risks, and consumer rights and obligations. The fintech setting of this mandate necessitates companies to create an appealing app interface and make all the terms and conditions clear and easily comprehensible by customers, including fees or investment risks, as an initiative to empower consumers.

Articles 7 and 8 require this information to be delivered in easily understandable Indonesian and in formats appropriate to the communication channel used-websites, apps, emails, or other digital media. Meanwhile, Article 9 obliges service providers to maintain the confidentiality and security of consumers' data/information, an essential obligation in fintech services that rely on digital data and cloud systems.

Articles 16-17 also regulate consumer rights protection, declaring that consumers can access information, complaint services, and dispute resolution mechanisms. Article 16 underlines that all financial service providers are supposed to ensure highly accessible and professionally handled complaint services. This

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<sup>75</sup> Pythagoras N. Petratos, "Misinformation, Disinformation, and Fake News: Cyber Risks to Business," *Business Horizons* 64, no. 6 (2021): 763–74, <https://doi.org/10.1016/j.bushor.2021.07.012>.

implies that fintech providers should possess quick customer service systems, provide a variety of communication channels, and adopt a well-organized system to receive, monitor, and act on consumer complaints.<sup>76</sup> Article 17 expands consumer access to dispute resolution through Internal Dispute Resolution (IDR) and external dispute resolution through the Financial Services Sector Alternative Dispute Resolution Institution (LAPS SJK). These mechanisms offer legal assurance to consumers seeking justice in disputes with service providers.

Furthermore, this POJK introduces a more proactive protection approach through supervision and evaluation by OJK. Articles 30 through 34 highlight OJK's authority to conduct technology-based consumer protection supervision (market conduct supervision), including utilizing digital data and electronic reporting systems. Article 31 explicitly allows OJK to request data or information from Financial Services Business Actors related to service activities, complaints, and handling.

Articles 32 to 34 of POJK No. 6/POJK.07/2022 authorize OJK to investigate, address violations, and impose administrative sanctions on financial service providers who breach consumer protection regulations. These provisions reinforce OJK's proactive oversight role. Additionally, consumers are granted the right to submit complaints or reports of issues directly to OJK, creating a responsive and accountable channel for safeguarding consumer rights in the financial services sector, including technology-based services such as fintech.

This POJK also highlights OJK's commitment, which has always fostered inclusive justice in consumer protection, particularly for vulnerable consumers who are persons with disabilities and have low financial literacy.<sup>77</sup> The regulation promotes the national financial inclusion vision by guiding the financial service providers, i.e., fintech firms, to provide services accessible to all tiers of society. This incorporates designing disability-friendly application functions, using easy-to-understand and straightforward communication in the communication process, and regular financial literacy undertakings.

This regulation has not only been the norm of the law but a strategic tool that regulates the nature of business operations to be

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<sup>76</sup> Peter Gomber et al., "On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services," *Journal of Management Information Systems* 35, no. 1 (2018): 220–65, <https://doi.org/10.1080/07421222.2018.1440766>.

<sup>77</sup> Muhammad Akmal Noor, Afif, Maruf, Mawahib, Muhamad Zainal, Habib, "Developing Inclusive Regulations for Muslim Disabled Entrepreneurs ' Access to Sharia Fintech: Legal and Accessibility Perspectives," *Jurnal Ilmiah Al- Syir ' Ah* 23, no. 1 (2025): 70–86.

more responsible and consumer-focused.<sup>78</sup> OJK will incorporate consumer protection into corporate governance through the risk-based approach and active supervision to ensure that consumer protection is internalized in the corporate governance. The effectiveness with which consumer rights are upheld is essential to ensure that the general population trusts the digital financial services. This regulation would ensure the stability and integrity of Indonesia's digital economic ecosystem.

## The Role of Authorities in Overseeing Consumer Protection

In the rapidly expanding digital financial ecosystem, consumer protection has emerged as a pivotal issue, necessitating the active participation of various national regulatory authorities.<sup>79</sup> Three major institutions in Indonesia perform multiple roles in regulating and protecting consumers in the financial technology domain: the Financial Services Authority (OJK), the Bank of Indonesia (BI), and the Ministry of Communications and Digital Affairs (Komdigi). With their distinct functions, these institutions collaborate to establish a comprehensive consumer protection system, particularly in technology-based financial services or fintech.

OJK, as the institution responsible for regulating and supervising the financial services sector, plays a key role in ensuring that financial industry players, including fintech companies, operate with consideration for consumer interests. Through POJK No. 6/POJK.07/2022 on Consumer and Community Protection in the Financial Services Sector, OJK sets out fundamental principles such as transparency, fair treatment, data confidentiality, and dispute resolution. OJK also directly monitors the implementation of consumer protection and facilitates dispute resolution through internal mechanisms or the Alternative Dispute Resolution Institution for the Financial Services Sector (LAPS SJK). Moreover, OJK promotes an inclusive and financial literacy-based approach to reach vulnerable groups such as persons with disabilities and low-income communities. Practically, the fintech organizations under the supervision of OJK must offer services in a way that can be accessible and comprehensible to all groups of society.

Conversely, the Bank of Indonesia regulates and oversees the

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<sup>78</sup> Henri Kuokkanen and William Sun, *Companies, Meet Ethical Consumers: Strategic CSR Management to Impact Consumer Choice*, *Journal of Business Ethics*, vol. 166, 2020, <https://doi.org/10.1007/s10551-019-04145-4>.

<sup>79</sup> Marlene Amstad, "Regulating Fintech: Objectives, Principles, And Practices" (Tokyo, 2019), <https://www.econstor.eu/bitstream/10419/222783/1/1680064665.pdf>.



payment system and digital financial services, including e-wallets, QR code usage, and inter-platform transfer of funds. The BI lays down the policies so that all the payment system service providers run securely, transparently, and efficiently. These rules are essential in upholding the integrity and ensuring the financial system. In this regard, consumer protection is enforced through regulations that require payment system providers to deliver accurate and non-misleading information and to ensure system security to prevent harm to users.<sup>80</sup> Should any disruptions or violations in the payment system pose risks to consumers, BI may conduct technical evaluations and exercise stringent supervision of the related service providers. BI also encourages providers to implement strong authentication and data security technologies to protect consumers from cybercrime threats.

In the meantime, Komdigi controls and oversees aspects of information and communication technology, especially electronic systems and personal data protection. Komdigi plays a vital role in consumer protection in that most fintech and digital financial services, such as email and messaging, depend on collecting and handling user information. Ministry of Communications and Digital Affairs refers to the ITE Law provisions, particularly Article 26, which emphasizes the importance of protecting personal data as part of privacy rights. Furthermore, under Government Regulation No. 71 of 2019 concerning implementing Electronic Systems and Transactions, Komdigi requires every electronic system operator, including fintech applications, to maintain consumer data's confidentiality, integrity, and availability. Komdigi also provides public complaint channels for privacy violations or data misuse and may impose administrative sanctions or block services in cases of serious breaches.

These three institutions work in tandem to address a myriad of consumer protection challenges in the digital era. To take one example, where there is a breach of data confidentiality of a fintech application, Komdigi would look into the violation of privacy. In contrast, OJK would examine the ability of the business actor in the financial services industry to adhere to consumer protection standards. At the same time, if the breach involves a payment system or funds transfer, BI would determine the security of the system and its integrity. Such a coordination is essential in avoiding the splintering of consumer protection and enabling it to emerge

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<sup>80</sup> Ningyao Ye and Zeyu Zhao, "The Reform of Consumer Protection in Mobile Payment Services in China: Legislation, Regulation, and Dispute Resolution," *Computer Law and Security Review* 54, no. June (2024): 106007, <https://doi.org/10.1016/j.clsr.2024.106007>.

adequately to handle the complexity of the cross-sectoral digital services.

With fast-changing consumer protection in financial technology, consumers should be protected through a legal-formal approach, and dynamically.<sup>81</sup> These protection efforts often include digital financial education and literacy, which are conducted regularly by the three institutions, OJK, BI, and Komdigi. Such programs enlighten consumers regarding their rights and possible dangers and allow them to express their concerns and feedback, which enables regulatory bodies to evaluate and develop their policies and practices. Therefore, product regulations safeguard consumers, allow them to know their rights, and identify any possible risks incurred through digital financial services.

These three different but complementary regulatory entities are invaluable in establishing the population's trust in the digital financial system, which is safe, all-inclusive, and sustainable. They regulate and innovate using technology to protect consumers better. For example, OJK monitors compliance via high-tech data analytics, BI promotes multi-factor authentication and data security technologies, and Komdigi utilizes online tools to investigate data-related privacy breaches. Without strong monitoring and practical inter-agency cooperation, the consumers might incur losses related to unreliable business activities, information tampering, or technological flaws within the system. As such, OJK, BI, and Komdigi cannot be ignored when ensuring the stability of the Indonesian digital financial ecosystem.

## Security Risks and Mitigation Efforts in Digital and Fintech Transactions

The emergence of fintech has brought about sweeping transformations in how society engages in interactive financial services. Solutions like online payments to peer-to-peer borrowing provide a new degree of convenience, efficiency, and inclusivity with proximity-shifting capabilities for interaction in financial frontiers. Nonetheless, it is vital to note that along with these positive productivity gains have come the incredible and intricate security threats. These dangers are in the form of technical threats, operational threats, and high levels of digital illiteracy in the case of consumers.

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<sup>81</sup> Danang Dwi Cahyo and Bambang Tri Bawono, "A Justice Reform In Consumer Protection In Development Of Financial Technology," *Law Development Journal* 3, no. 3 (2021): 475, <https://doi.org/10.30659/ldj.3.3.475-480>.

Digital identity theft is one of the main risks in the fintech ecosystem.<sup>82</sup> This presents one of the most significant risks where cybercriminals hack into and misappropriate users' personal information, including identity numbers, email addresses, phone numbers, and even biometric data. This is then used to do unauthorized money transfers, such as making online loans or opening accounts. The effects of such measures are quite abrasive financially for consumers and reputationally for fintech service providers. However, given the proper awareness and precaution, the consumer plays a big part in avoiding such incidents. In addition to the loss of material things, the victims can also have mental problems because of the complex nature of the identity recovery procedure. In the cases of identity theft, the companies related to fintech may lose their credibility among the population and face the risk of some regulatory penalties if they are considered negligent about data safety. Thus, individual data security and consumer education are key factors to ensuring the integrity of the fintech services in the digital age.<sup>83</sup>

Moreover, phishing and social engineering are critical challenges to the fintech world. There is a tendency to confuse managerial organizations with the support of fake emails, SMS, or telephone calls by impersonating a criminal and inviting victims to provide their essential data, like OTPs, PINs, or passwords. The problem is that many consumers become misled as they fail to perceive fake and honest communication. Digital literacy, as one more aspect of consumer protection, requires such attacks. The solution will rest in sensitizing and educating the user to avoid losses from social manipulation of digital financial dealings.

Hacking of accounts and applications is a significant concern for fintech security. Due to the rush in development or lack of capital, some platforms still have poor security mechanisms. Hackers exploit these vulnerabilities to gain unauthorized access to user accounts and steal. Several high-profile incidents have demonstrated that even a single security flaw can lead to substantial financial losses.

Fintech may also be used abusively to conduct illegal transactions and to launder money.<sup>84</sup> Unless properly addressed, the

<sup>82</sup> Krishnan Srinivasan Chari, "Fraud Risk in Digitized Fintech Ecosystem: Troubling Trends, Issues and Approaches to Mitigate Risk," *SSRN Electronic Journal*, 2020, 1–8, <https://doi.org/10.2139/ssrn.3680456>.

<sup>83</sup> Hassan H.H. Aldboush and Marah Ferdous, "Building Trust in Fintech: An Analysis of Ethical and Privacy Considerations in the Intersection of Big Data, AI, and Customer Trust," *International Journal of Financial Studies* 11, no. 3 (2023), <https://doi.org/10.3390/ijfs11030090>.

<sup>84</sup> Karolina Gecevičienė, Irena Danilevičienė, and Laima Okunevičiūtė, "Impact Of Fintech Sector

flexibility and the anonymity of the fintech services can be easily abused by criminals who can use them to conceal the source of the illegitimate funds with the help of lax Know Your Customer (KYC) and Anti-Money Laundering (AML) systems. This danger is even more threatening when service providers do not implement effective mechanisms to detect suspicious transactions or collaborate with supervisory and law enforcement agencies.

System failures are also a real risk faced by fintech services.<sup>85</sup> Software bugs or server downtime can cause service disruptions, obstruct transactions, and even result in data loss. In financial services, such disruptions can be highly damaging as they involve consumer assets. Therefore, software testing, secure data backups, and disaster recovery mechanisms must be part of fintech's standard operations.

In addition to technical issues, the problem lies in a fintech business's fast-paced, competitive model. Quite a few startups invest in product innovations that appeal to the investors and save little on security. They can also be handicapped in their operations by resource and budget constraints, which could bring about functioning with a short number of cybersecurity personnel or the use of stringent security measures. This is a significant risk, especially when it comes to handling public money and the personal details of consumers, which may end up being hacked or leaked in the case of a lack of an organized security system.

The other aggravating factor is the low state of consumer awareness concerning data and privacy protection.<sup>86</sup> Most fintech users do not read privacy policies and give app access to their contacts, location, and financial information without paying much attention. The tendency to create weak or repetitive passwords on multiple platforms is another source of vulnerability, since if one account is compromised, another one may be compromised as well. The absence of digital education makes users oblivious to the need for encryption or two-factor authentication. Personal data can thus be easily misused, as there is more fraudulent behavior, and the trust in digital finance services is weakened. However, this consciousness and secure actions are fundamental in developing a

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Development On Money Laundering Prevention," *Ekonomicko-Manazerske Spektrum* 0839 (2024): 54–66.

<sup>85</sup> Abhishek Mahalle, Jianming Yong, and Xiaohui Tao, "Regulatory Challenges and Mitigation for Account Services Offered by FinTech," in *Proceedings of the 2021 IEEE 24th International Conference on Computer Supported Cooperative Work in Design, CSCWD 2021*, 2021, 280–87, <https://doi.org/10.1109/CSCWD49262.2021.9437631>.

<sup>86</sup> Mohsin Ali Farhad, "Consumer Data Protection Laws and Their Impact on Business Models in the Tech Industry," *Telecommunications Policy* 48, no. 9 (2024): 102836, <https://doi.org/10.1016/j.telpol.2024.102836>.

reliable fintech system.

There is a need to use a multi-level approach that concerns all the stakeholders to mitigate the risks involved in the fintech sector. Regulatory bodies such as OJK, BI, and Komdigi are essential in this partnership. According to POJK No. 6/POJK.07/2022, as issued by OJK, the protection of consumers must begin with financial service providers operating in fintech, grounded on the principles of transparency, fairness, and data security. BI controls the payment system, and the digital wallet and payment gateway operators must use two-factor authentication to encrypt their data. Komdigi, the electronic systems overseer, ensures that ITE Law and other legislation on data protection protect personal information. Such a partnership is needed to establish a safe and reliable fintech ecosystem.

The fintech services provider must establish a quality security infrastructure to safeguard user information and transactions at the company level. This also incorporates applying end-to-end encryption, multi-factor authentication, and frequent penetration testing to reveal any possible weak points. Also, fintech organizations are expected to have a team that responds to incident cases to address potential data breaches or attacks and make personnel trained on optimal cybersecurity techniques. Such measures are essential to ensure the reputation of fintech systems and customer confidence.

Popular knowledge (education, digital literacy) also enhances awareness of safe fintech use.<sup>87</sup> Government and industry participants should work together to offer educational services on learning how to detect fraudulent activities, keep personal information secure, and sensibly employ fintech services. Such education may be conducted in different ways, like through social media, webinars, and collaboration with schools and universities. By enhancing awareness, the population will be expected not to experience security issues and engage in the digital economy more safely and responsibly.

Furthermore, the government and the private sector should partner because it is healthy for developing a sustainable digital security ecosystem.<sup>88</sup> This involves developing national security standards, increasing control institutions' capacity, and setting up

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<sup>87</sup> Reem Ahmed AlSuwaidi and Charilaos Mertzanis, "Financial Literacy and FinTech Market Growth around the World," *International Review of Financial Analysis* 95, no. PB (2024): 103481, <https://doi.org/10.1016/j.irfa.2024.103481>.

<sup>88</sup> Najla Abu, Filipa Pires da Silva, and Pedro Rino Vieira, "Government Support for SMEs in the Fintech Era: Enhancing Access to Finance, Survival, and Performance," *Digital Business* 5, no. 1 (2025): 100099, <https://doi.org/10.1016/j.digbus.2024.100099>.

centers that report and respond to cyber incidents. Fintech players are also suggested to take a proactive role in security forums on national and international fronts. With this cooperation, a safer digital environment can be established that will facilitate the digital economic development and, at the same time, keep the consumer data and transactions safe against digital threats. It is a team thing, and we must all be involved.

## Regulatory Innovation for Adaptive Digital Security

With the rise of the digital economy, fintech contributes more and more to the world economy through technology-based money transfer and exchange. However, a significant challenge regarding security lurks behind the convenience and speed they bring. Such vulnerabilities as personal data theft, use, and abuse of digital identities, as well as even more advanced hacking actions, require reactive and proactive policies. The OJK and the Bank of Indonesia, as the primary regulators of the Indonesian fintech scene, play a pivotal role in striking the correct balance between innovation and consumer protection as the digital economy is developing, at safe and sustainable rates.

Any attempt to control the level of security in digital transactions should start with enhancing personal data protection.<sup>89</sup> Adopting Law No. 27 of 2022 on Personal Data Protection is essential. However, the successful execution of the same deserves technical specifications, including the requirement to report data breaches and the introduction of the periodic compliance audit. The implementation of regulations and policies that push fintech companies to implement data management standards through the International Organization for Standardization/International Electrotechnical Commission 27001 (ISO/IEC /27001) framework and the requirement of transparent reporting of security incidents to the ordinary person will build trust among the people. Also, laws should have strong administrative policies and criminal penalties for providers who cannot ensure customer information confidentiality.

In addition, technological infrastructure security should become a special concern.<sup>90</sup> Online payment systems should develop policies backing the blockchain technology to decrease the chances

<sup>89</sup> Zlatan Morić et al., "Protection of Personal Data in the Context of E-Commerce," *Journal of Cybersecurity and Privacy* 4, no. 3 (2024): 731–61, <https://doi.org/10.3390/jcp4030034>.

<sup>90</sup> Marina Larionova and Andrey Shelepov, "Emerging Regulation for the Digital Economy: Challenges and Opportunities for Multilateral Global Governance," *International Organisations Research Journal* 16, no. 1 (2021): 1–32, <https://doi.org/10.17323/1996-7845-2021-01-02>.

of manipulating transactions due to decentralized records. Third-party interference can be reduced by the permitted innovation of the smart contracts, which have a body of smart contracts that are entailed to self-perform using proven code. Additionally, periodic pen-testing should be imposed on the fintech providers and end-to-end encryption on the application layer by them to prevent the detection of cyberattacks promptly.

Employing strident security standards and frequent certification ensures discipline in the fintech ecosystem. The government and OJK can require the IT security certification of every fintech startup to be conducted by a nationally recognized body before startups can begin. Periodic external verification to determine adherence to international best practices, like Payment Card Industry Data Security Standard (PCI DSS) on payment card security or Open Web Application Security Project (OWASP) on web application security, will not only mean implementation of extra measures in regulating policy but also in daily practice. Such policies should also entail vulnerability mitigation policies, such as repair schedules and the announcement of auditing outcomes.

Incentive policies should support the development of high-security technology introduced to the market, and research funds should be allocated to the area to create a better and more vibrant fintech environment. One should be optimistic about the potential merits of biometric authentication, like fingerprint, facial recognition, or retina scanning, in the risk reduction of credential misuse, as artificial intelligence (AI) and machine learning (ML) tools can monitor transaction patterns to detect any malicious anomaly. These technologies will enable automatic alarms or bring doubtful transactions to a standstill until additional verification, which will positively affect the safety of fintech transactions. Governance should allow the funding of research and training of cybersecurity workforces to enable medium and smaller fintech companies to implement such technologies and bring a more secure and dynamic fintech ecosystem.

Regulations should become risk-based to be up to date.<sup>91</sup> Using risk-based practices allows the regulators to ensure that they focus on the weak links of fintech, including peer-to-peer lending with excessive interest rates or automated investment platforms controlling large amounts of funds. OJK could release a risk map that is updated periodically to target fraud-prone segments or data

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<sup>91</sup> Milena Vučinić and Radoica Luburić, "Fintech, Risk-Based Thinking and Cyber Risk," *Journal of Central Banking Theory and Practice* 11, no. 2 (2022): 27–53, <https://doi.org/10.2478/jcbtp-2022-0012>.

leak problems. This is so that the resources put into the oversight are used effectively and react to the industry dynamics. It is also critical to achieve inter-agency and international collaboration. Threat intelligence must be shared among OJK, BI, Komdigi, and the National Cyber and Crypto Agency, and they should harmonize security standards and train cyber responses. On the international/global level, cooperation in the framework of such an organization as the Group of Twenty (G20) or ASEAN Digital Economy Forum will enable Indonesia to use state best practices and uniform its regulatory framework with the international one, reassuring the audience that they are part of a global effort to secure the fintech ecosystem.

Incremental yet regular regulatory updates will ensure policies keep pace with technological innovation. The government should establish a mechanism for regular consultations with industry players and fintech associations to test new policy drafts in a regulatory sandbox before full implementation. This trial environment allows fintech to innovate while remaining under close regulatory supervision.

Besides the set of formal rules, emphasis should be placed on digital security education and people's literacy.<sup>92</sup> Safe practices, including making strong, unique passwords, two-factor authentication, and identifying phishing and social engineering attacks, should be taught to the population through national campaigns that use social media, workshops, and educational modules in schools and universities. These digital literacy campaigns are vital to promoting digital literacy, and savvy consumers are the best deterrent to fraud.<sup>93</sup> The possibility of preventing fraud is significantly increased if users are careful when making transactions online, making them feel informed and empowered.

By combining strong personal data protection, secure technological infrastructure, strict standards and certifications, the adoption of advanced technologies, risk-based regulations, multi-agency collaboration, regular policy updates, and digital literacy, Indonesia can build a digital and fintech transaction ecosystem that is both secure and dynamic. Adaptive regulation entwines fintech

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<sup>92</sup> Musaddag Elayah and Saima Jamil, "Impact of Digital Literacy and Online Privacy Concerns on Cybersecurity Behaviour: The Moderating Role of Cybersecurity Awareness," *International Journal of Cyber Criminology* 17, no. 2 (2023): 166–87, <https://doi.org/10.5281/zenodo.4766711>.

<sup>93</sup> Rui Li, Jiaxin Shao, and Duanyang Gao, "The Impact of Digital Literacy on the Health Behavior of Rural Older Adults: Evidence from China," *BMC Public Health* 25 (2025), <https://doi.org/10.1186/s12889-025-21964-5>.



suppliers, empowers customers, and develops sustainable innovation. It is just by taking this comprehensive approach to the issue that Indonesia will be able to build its digital economy at an accelerated rate and at the same time ensure that all stakeholders have a level of trust and are guaranteed to remain safe.

## Conclusion

The development of financial technology within the digital economy ecosystem has revolutionized how people conduct transactions, access financial services, and participate in the economic system. Fintech innovations offer convenience and efficiency and expand financial access, particularly for groups previously underserved by conventional banking systems. This positive impact on underserved groups is a testament to the transformative power of fintech. However, serious consumer protection and transaction security challenges lie behind these benefits. Risks such as digital identity theft, misuse of personal data, fraud through social engineering, and vulnerabilities in fintech application security threaten public trust in the digital ecosystem.

To address these challenges, a regulatory framework that is adaptive to technological developments, participatory in involving various stakeholders, and committed to protecting consumer rights is needed. Law No. 8 of 1999 on Consumer Protection, Law No. 11 of 2008 on Electronic Information and Transactions as amended by Law No. 1 of 2024 and OJK Regulation No. 6/POJK.07/2022 on Consumer and Community Protection in the Financial Services Sector serve as the primary legal foundation to ensure consumer rights are protected and to guarantee security in the use of technology-based financial services. These regulations, emphasizing information transparency, fair treatment, data security, and fast and effective dispute resolution, provide a reassuring framework for the fintech industry.

On the other hand, the role of regulatory authorities such as the Financial Services Authority (OJK), Bank of Indonesia, and the Ministry of Communication and Digital is crucial in supervision, law enforcement, and public education regarding rights and risks in digital financial services. Their efforts in public education ensure that all stakeholders, from consumers to fintech companies, are well-informed about the rights and risks in digital financial services. Through the synergy of regulation and oversight, a digital financial system that is inclusive, secure, and capable of driving sustainable national economic growth can be established.

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## **Acknowledgment**

None

## **Funding Information**

None

## **Conflicting Interest Statement**

The authors state that there is no conflict of interest in the publication of this article.

## **History of Article**

Submitted : May 15, 2025

Revised : August 17, 2025

Accepted : October 21, 2025

Published : November 17, 2025