WebLog Journal of Public Health and Epidemiology

Review Article
Published: 25 Apr, 2026

Digital Assets: A New Path for Financial Innovation and Consumer Protection

*Shungui Xiang[1], Yin Tang[2] and Jun Zhang[3]**

[1]Library, Tourism College of Zhejiang, Hangzhou, 311231, China

[2]School of Travel Services and Management, Tourism College of Zhejiang, Hangzhou, 311231, China

[3]Department of Education, Sehan University, Yeongam-gun, Jeollanam-do, 650106, Republic of Korea

Abstract

With the rapid development of the digital economy, digital assets have gradually become an important driving force for the transformation of the financial system. Based on technologies such as Blockchain, digital assets have played a significant role in improving financial efficiency, promoting product innovation, and advancing inclusive finance. At the same time, their characteristics of decentralization and transparency have, to some extent, provided new pathways for consumer protection.

However, the development of digital assets is also accompanied by issues such as price volatility, technological risks, and regulatory gaps, which pose challenges to financial stability and consumer rights. Based on a review of relevant theories and literature, this paper systematically analyzes the mechanisms through which digital assets promote financial innovation and consumer protection, and explores their potential risks and optimization paths. The study finds that digital assets can achieve a synergy between innovation and protection, but this depends on the establishment of a sound regulatory framework, strengthened technological security, and improved investor education.

Keywords: Digital Assets; Financial Innovation; Consumer Protection; Blockchain

OPEN ACCESS

Correspondence:
Dr. Jun Zhang, Ph.D., Department of Education, Sehan University, Yeongam-gun, Jeollanam-do, 650106, Republic of Korea,
E-mail: zhangjunahnu@163.com/
ORCID: https://orcid.org/0009-0004-1221-9920

Received Date: *02 Apr 2026*
Accepted Date: *23 Apr 2026*
Published Date: *25 Apr 2026*

Citation:
Xiang S, Tang Y, Zhang J. Digital Assets: A New Path for Financial Innovation and Consumer Protection. WebLog J Public Health Epidemiol. wjphe.2026.d2501. https://doi.org/10.5281/zenodo.19943655

Introduction

In the context of the digital economy, the rapid development of information technology is reshaping the operational logic of traditional financial systems. Distributed technologies represented by Blockchain have enabled value transfer to no longer rely on traditional financial intermediaries, thereby promoting the emergence of digital assets. Represented by cryptocurrencies, digital assets, with their characteristics of decentralization, anonymity, and global circulation, have rapidly become an important component of the financial market.

The development of digital assets has not only transformed the structure of financial markets but has also posed new challenges to financial regulation and consumer protection. On the one hand, their technological advantages promote financial innovation and improve resource allocation efficiency; on the other hand, their high-risk nature exposes consumers to greater uncertainty. Therefore, how to effectively protect consumers while promoting financial innovation has become a key issue of concern for both academia and policymakers.

Research on Financial Innovation

Research on financial innovation mainly focuses on the impact of technological progress on the financial system. With the continuous development of information technology, financial innovation has gradually shifted from institutional innovation to technology-driven transformation, particularly in the context of financial technology (FinTech), where innovation has become increasingly diversified. Among these, new financial models represented by decentralized finance (DeFi) have become one of the major research hotspots. From a theoretical perspective, financial innovation is generally regarded as an important means of improving resource allocation efficiency. The traditional financial system relies on intermediaries to allocate funds; however, this process is often associated with high costs and information asymmetry. Digital assets, based on Blockchain technology, enable decentralized operations, allowing transaction parties to directly exchange value, thereby reducing reliance on intermediaries. This transformation not only improves transaction efficiency but also, to some extent, reshapes the structure of financial markets. From a practical perspective, digital

assets have promoted innovation in various financial products and services. For example, blockchain-based lending platforms enable peer-to-peer financing, while Smart Contracts can automatically execute contractual terms, thereby reducing human intervention. In addition, digital assets have facilitated the personalization and diversification of financial services, allowing users to select financial products according to their specific needs.

However, financial innovation is not entirely positive, as it may also introduce new risks. Some studies have pointed out that excessive innovation may lead to increased complexity in the financial system, thereby raising systemic risks. Furthermore, in the absence of effective regulation, new financial products may be misused, undermining market stability [11].

Research on Consumer Protection

In the field of consumer protection, scholars mainly focus on issues such as information asymmetry, risk control, and regulatory mechanisms in financial markets. With the rise of digital assets, consumer protection faces new challenges. In traditional financial systems, consumer protection primarily depends on legal frameworks and regulatory institutions. However, in the context of digital assets, the effectiveness of these traditional mechanisms is constrained due to their decentralized nature.

First, the problem of information asymmetry remains prominent in the digital asset market. Although blockchain technology is characterized by transparency and openness, ordinary investors often lack the expertise required to understand complex technical information. As a result, a situation of "formal transparency" coexisting with "substantive opacity" emerges, placing investors at a disadvantage in decision-making [4]. Second, the digital asset market is associated with high levels of risk. For instance, assets represented by Bitcoin exhibit significant price volatility, which can easily trigger speculative behavior. In addition, irregular activities such as fraud and market manipulation are present, posing threats to consumer rights and interests. Third, regulatory gaps constitute a major challenge for consumer protection. Due to the cross-border nature of digital assets, significant differences exist in regulatory policies across countries, making regulatory coordination difficult. In regions with relatively loose regulation, investor protection mechanisms tend to be weak, increasing the likelihood of risk events [5].

Therefore, future research should adopt an integrated perspective by incorporating financial innovation and consumer protection into a unified analytical framework to explore the interaction mechanisms between them. At the same time, combining case studies and empirical analysis would enhance the explanatory power and practical relevance of research. Only by comprehensively understanding the dual role of digital assets can more scientifically grounded theoretical support and policy recommendations be provided for their sustainable development.

Theoretical Foundations

The operation and development of digital assets rely heavily on the support of next-generation information technologies, with Blockchain and Smart Contracts forming their core foundation. Blockchain enables decentralized data storage and sharing through a distributed ledger structure, allowing transaction information to be synchronously recorded across multiple nodes. This mechanism effectively prevents single points of failure and data tampering that are common in traditional centralized systems. Such a technological architecture not only enhances system security and reliability but also improves the transparency and traceability of transactions.

Smart contracts represent an advanced automated execution mechanism built upon blockchain technology. By embedding predefined rules into code, smart contracts automatically trigger transactions when specific conditions are met, thereby reducing human intervention and operational risks while improving transaction efficiency and execution certainty.

From the perspective of financial innovation theory, traditional financial systems primarily rely on intermediaries (such as banks and securities firms) to perform capital allocation and risk management. According to financial intermediation theory, intermediaries play a crucial role in reducing information asymmetry, diversifying risks, and providing liquidity. However, this process is often associated with high transaction costs and efficiency losses, including intermediary fees, time delays, and operational complexity [6]. With the development of digital assets, decentralized mechanisms based on blockchain technology enable direct peer-to-peer interactions between transaction parties, thereby reducing reliance on traditional intermediaries. This trend of "disintermediation" not only lowers transaction costs but also significantly improves capital circulation efficiency, promoting the financial system toward a more efficient and open structure. In terms of consumer protection, information asymmetry theory provides an important analytical framework. This theory suggests that in market transactions, unequal access to information places parties in asymmetric positions, leading to issues such as adverse selection and moral hazard, which may ultimately result in market failure. In traditional financial systems, consumers are often at an informational disadvantage and must rely on regulatory institutions and legal frameworks to safeguard their rights and interests [2].

Digital assets, to some extent, mitigate information asymmetry through technological means. The transparency of blockchain allows transaction data to be widely accessed and verified, thereby reducing information opacity. At the same time, the automated execution mechanism of smart contracts ensures that transactions are conducted according to predefined rules, minimizing the risks of human manipulation and default. In addition, digital assets grant users greater control over their assets, enabling them to manage their holdings directly and reducing dependence on intermediaries.

Pathways Through Which Digital Assets Promote Financial Innovation

Promoting Financial Product Innovation

The development of digital assets provides a new technological foundation and implementation pathway for financial product and service innovation. Leveraging blockchain and smart contract technologies, traditional financial products can be designed and operated in more flexible and efficient ways, thereby promoting the diversification of financial markets [7].

For example, decentralized financial systems built on blockchain enable functions such as lending, trading, and asset management to be conducted without traditional financial institutions. In the field of decentralized lending, users can directly engage in borrowing and lending through smart contracts, with the system automatically handling collateralization, interest calculation, and liquidation processes based on predefined rules. This significantly improves transaction efficiency while reducing operational costs. At the same

time, the development of digital trading platforms has made asset transactions more convenient and transparent, allowing users to conduct real-time transactions on a global scale. In addition, digital assets have given rise to new financial instruments such as stablecoins and non-fungible tokens (NFTs), further enriching the market structure. These innovations not only enhance the diversity of financial services but also reshape the competitive landscape of traditional financial markets. By lowering entry barriers through technological means, emerging market participants can more easily engage in the provision of financial services, thereby increasing market vitality. However, it should be noted that financial product innovation may also introduce new risks. Therefore, while promoting innovation, it is essential to strengthen risk management and regulatory oversight.

Promoting the Development of Inclusive Finance

The core objective of inclusive finance is to provide accessible and affordable financial services to populations that are underserved by traditional financial systems. Digital assets play an important role in promoting inclusive finance by lowering entry barriers and reducing transaction costs. In traditional financial systems, access to financial services is often constrained by factors such as geographic location, credit history, and income level, leaving certain groups excluded from basic financial services [16]. Digital assets, through the integration of the internet and Blockchain technology, break geographical limitations, enabling users to participate in financial activities with only basic internet access. This "low-threshold" feature allows more individuals to enter the financial system, thereby expanding the coverage of financial services. In addition, digital asset transactions are characterized by relatively low costs, particularly in cross-border payments and small-value transactions, which makes them well-suited to meet the financial needs of low-income groups. At the same time, digital assets create new opportunities for innovative financial services. For instance, through decentralized platforms, users can directly engage in financing or investment activities, thereby broadening access to capital. This model has significant potential in developing countries, where it can help address the unequal distribution of financial resources.

Mechanisms Through Which Digital Assets Promote Consumer Protection

Enhancing Information Transparency

In traditional financial systems, information asymmetry is one of the key factors leading to the infringement of consumer rights. Financial institutions typically possess more information, placing ordinary consumers at a disadvantage. This asymmetry can give rise to moral hazard and adverse selection problems. Digital assets, relying on Blockchain technology, enhance market transparency by recording transaction data on distributed ledgers. In other words, transaction records on the blockchain are publicly accessible and immutable, allowing any participant to verify the authenticity of transaction information through technical means. This mechanism reduces information opacity and makes the transaction process more transparent, thereby lowering the likelihood of fraudulent activities. Moreover, a transparent data environment provides convenience for regulatory authorities, enabling them to monitor market behavior more effectively and identify abnormal transactions in a timely manner. However, it is important to note that transparency does not necessarily equate to comprehensibility. Due to the technical complexity of blockchain systems, ordinary investors may find it difficult to accurately interpret relevant information, which limits its protective effectiveness. Therefore, while improving transparency, it is also necessary to enhance information disclosure practices and investor education so that transparent information can truly function as an effective protection mechanism.

Reducing Transaction Costs

Reducing transaction costs is an important pathway through which digital assets enhance consumer protection. In traditional financial systems, transactions typically rely on intermediaries such as banks and payment institutions, which charge service fees and thereby increase the financial burden on consumers. Digital assets, through decentralized mechanisms, reduce the need for intermediaries, enabling direct transactions between users and significantly lowering costs.

In the field of payments, digital assets enable peer-to-peer transfers, reducing intermediary fees, particularly in cross-border transactions. Traditional cross-border payments often involve multiple intermediaries, resulting in higher costs and longer processing times. In contrast, digital assets can complete transactions within a relatively short period, substantially reducing both time and cost. Furthermore, in investment and trading activities, digital asset platforms generally charge lower transaction fees, allowing consumers to participate in market activities at a reduced cost. Lower transaction costs also broaden consumer participation by enabling more individuals to enter financial markets, thereby improving access to financial services. This is particularly beneficial for low-income groups, as it helps mitigate financial exclusion caused by high transaction costs.

Risks and Challenges Brought by Digital Assets

Market Volatility Risk

One of the most prominent characteristics of the digital asset market is its high price volatility, which poses significant risks to investors. Major digital assets represented by Bitcoin can experience sharp price increases or declines within a short period, a phenomenon that is relatively uncommon in traditional financial markets. The causes of such volatility include changes in market supply and demand, macroeconomic conditions, policy adjustments, and fluctuations in investor sentiment. Digital assets lack stable intrinsic value support, and their prices largely depend on market expectations and speculative behavior. When market sentiment is optimistic, prices may rise rapidly; however, once confidence declines, prices may fall sharply, creating a "bubble–burst" cycle. For ordinary investors, high volatility implies greater uncertainty and risk. Poor investment decisions may result in substantial losses within a short period. Therefore, market volatility not only affects investment returns but also poses potential threats to financial market stability [14].

Technological Security Risks

The operation of digital assets heavily relies on information technology, and their security is directly related to the safety of users' assets. However, in practice, technological security issues occur frequently and have become a major constraint on the development of digital assets. These risks mainly include hacking attacks, system vulnerabilities, and improper private key management. For instance, hacking attacks are among the most common technological risks. Due to the high economic value of digital assets, trading platforms and wallet systems are often targeted by cyberattacks. Once a system is compromised, user assets may be stolen, and due to the irreversibility

of transactions, such losses are often difficult to recover. In addition, system vulnerabilities constitute another important source of risk. Particularly in applications based on Smart Contracts, coding flaws may be exploited maliciously, leading to asset losses or system malfunctions [13].

Regulatory Gaps

At present, the rapid development of digital assets has far outpaced the evolution of regulatory frameworks, making regulatory gaps a prominent issue. Due to the cross-border nature of digital assets, significant differences exist among countries in terms of legal classification and regulatory policies, which increases market uncertainty [10]. At the legal level, some countries have yet to clearly define the nature of digital assets—whether they should be treated as currency, commodities, or financial assets. Different classifications directly affect regulatory approaches, and such legal ambiguity exposes market participants to considerable institutional risks. In regulatory practice, certain jurisdictions adopt relatively loose or even minimal regulatory approaches, attracting substantial capital inflows while simultaneously creating environments conducive to illegal activities such as money laundering and fraud. Therefore, regulatory gaps not only disrupt market order but also pose challenges to consumer protection. Establishing a unified and coordinated regulatory framework is a crucial prerequisite for the healthy development of digital assets.

Insufficient Consumer Awareness

Insufficient consumer awareness is a widespread issue in the digital asset market and an important factor contributing to investment risk. Due to the complex technological principles and financial mechanisms involved, ordinary investors often lack the necessary expertise to fully understand how digital assets operate and the risks they entail. Some investors focus primarily on the "high return" aspect of digital assets while overlooking their high-risk nature. Influenced by market hype or social media, they may engage in herd behavior and participate in highly speculative investment activities. Furthermore, the channels for obtaining information are often complex and vary in quality, making investors susceptible to misinformation or misleading promotions. As a result, they may make irrational investment decisions [12]. In summary, insufficient consumer awareness, combined with the inherent risks of digital assets, significantly increases the likelihood of financial losses, highlighting the importance of enhancing investor education and improving information quality in the market.

Innovation and Consumer Protection

Improving the Regulatory Framework

In the context of the rapid development of digital assets, establishing a scientific, systematic, and forward-looking regulatory framework is crucial for balancing financial innovation and consumer protection. Due to the diversity and functional differences of digital assets, the traditional "one-size-fits-all" regulatory approach is insufficient to address their complexity. Therefore, it is necessary to develop a classification-based regulatory system, implementing differentiated supervision according to the risk characteristics and functional attributes of various types of digital assets.

For example, for cryptocurrencies primarily used for payment purposes, regulatory focus should be placed on price volatility and anti-money laundering risks; whereas for digital tokens representing assets, greater emphasis should be placed on information disclosure and investor protection requirements. In addition, the regulatory framework should balance innovation and risk control, avoiding excessive regulation that may hinder technological development. On the one hand, it is essential to clarify the legal status of digital assets and establish unified regulatory standards to reduce market uncertainty. On the other hand, regulatory tools such as "regulatory sandboxes" can be introduced to provide experimental spaces for innovation, allowing new technologies to develop within a controlled environment. Meanwhile, coordination among regulatory authorities should be strengthened to form a multi-agency collaborative mechanism, thereby improving regulatory efficiency and enforcement capacity [8]. Overall, improving the regulatory framework is not only a key measure for risk prevention but also an institutional guarantee for the healthy development of digital assets.

Strengthening Information Disclosure

Information disclosure is an important means of mitigating information asymmetry and protecting investors' rights and interests. In the digital asset market, due to the high level of technological complexity, ordinary investors often find it difficult to fully understand related products and their risks. Therefore, establishing a sound information disclosure mechanism is essential for enhancing market transparency. First, it is necessary to define clear disclosure standards for digital asset issuance and trading processes, including project background, technical principles, risk factors, and the use of funds, ensuring that information is accurate, complete, and comprehensible. Second, the forms of information disclosure should be diversified, such as through data visualization and risk rating systems, to improve readability and accessibility. In addition, a continuous disclosure mechanism should be established to provide dynamic updates on project operations, enabling investors to access timely and relevant information (Semenova, 2025). Through these measures, information disclosure can more effectively support rational decision-making and enhance consumer protection.

Enhancing Technological Security

Technological security is a fundamental prerequisite for the stable operation of digital asset systems and a core component of consumer protection. As digital assets heavily rely on Blockchain technology, their security is directly linked to the safety of users' assets. However, in practice, issues such as hacking attacks, system vulnerabilities, and private key loss continue to pose significant risks. To address these challenges, technological security must be strengthened at multiple levels. First, during the system design phase, advanced encryption algorithms and security protocols should be adopted to enhance system protection and prevent data tampering or theft [1]. Second, a comprehensive security audit mechanism should be established to rigorously test and verify Smart Contracts code, thereby reducing risks associated with program vulnerabilities.

Furthermore, regulatory oversight of trading platforms should be strengthened, requiring the implementation of multi-factor authentication and risk monitoring mechanisms to ensure account security [9]. At the same time, efforts should be made to develop and unify technical standards across the industry to improve overall security levels. For example, certification standards can be introduced to identify compliant platforms, thereby enhancing user trust. In addition, an effective emergency response mechanism should be established to promptly address security incidents and minimize losses.

Overall, strengthening technological security not only reduces the

likelihood of risk events but also enhances the stability and credibility of the digital asset market, providing a solid foundation for financial innovation.

Conclusion

As an important outcome of financial technology development, digital assets demonstrate significant advantages in promoting financial innovation while also offering new pathways for consumer protection. However, the risks they introduce cannot be overlooked. In the future, it is essential to achieve a balance between technological advancement and institutional development. By improving regulatory frameworks and enhancing market transparency, digital assets can better promote financial innovation while effectively safeguarding consumer rights, thereby contributing to the sustainable development of financial markets.

References

1. Adeola E. A, Adeyinka G. O, Jegede V. M, Olabisi D, Salau K. K. O, Olatunji B. B & Olawale R. A. Integrating AI and Encryption to Safeguard Digital Assets Globally. International Journal of Innovative Science and Research Technology (IJISRT), 2025, IJISRT25SEP1242, 2337-2345. https://doi.org/10.38124/ijisrt/25sep1242
2. Aben T. A, Van Der Valk W, Roehrich J. K & Selviaridis K. Managing information asymmetry in public–private relationships undergoing a digital transformation: the role of contractual and relational governance. International Journal of Operations & Production Management, 2021, 41(7), 1145-1191.
3. Семенова С. Disclosure of Digital Assets in Non-Financial Reporting. Економіка та суспільство, 2025, (82). https://doi.org/10.32782/2524-0072/2025-82-10
4. Gaivoronski A, Gorbachuk V, Dunaievskyi M & Suleimanov S. B. Digital platforms to close the information asymmetry GAPS. International Scientific Technical Journal" Problems of Control and Informatics", 2022, 67(6), 67-82.
5. Gerunov A. Risk in digital assets. Risk analysis for the digital age, 2022, 81-11.
6. Gbadebo A. D. Theories of financial intermediation: Evaluation and empirical relevance. Journal of Law and Sustainable Development, 2024, 12(9), e3950-e3950.
7. Koshelev K. A. Trends in the evolution of the digital financial assets market in the context of the digital transformation of the global economy. Finance: Theory and Practice, 2022, 26(4), 80-94.
8. Muradyan S. V. Digital assets: Legal regulation and estimation of risks. Journal of Digital Technologies and Law, 2023, 1(1).
9. Olivier W & Buys P. Audit Principles and Blockchain-Based Digital Assets. In Auditing Bitcoin: A Framework for Digital Asset Assurance (pp. 53-68). Singapore: Springer Nature Singapore. 2026. https://doi.org/10.1007/978-981-95-5775-2_4
10. Riabchenko Y, Onyshchenko A, Kudin V, Kononets O & Holdskyi V. Digital assets and property rights: Regulation and legal implications within the EU and globally. Statute Law Review, 2025, 46(3), hmaf029.
11. Shavshukov V. M & Zhuravleva N. A. National and International financial market regulation and supervision Systems: Challenges and solutions. Journal of Risk and Financial Management, 2023, 16(6), 289. https://doi.org/10.3390/jrfm16060289
12. Sagkaya Gungor A & Ozansoy Cadirci T. Understanding digital consumer: A review, synthesis, and future research agenda. International Journal of Consumer Studies, 2022, 46(5), 1829-1858. https://doi.org/10.1111/ijcs.12809
13. Teng H. W, Hardle W. K, Osterrieder J, Pele D. T, Baals L. J, Papavassiliou, V & Xhumari E. Digital assets: risks, regulations, mitigation. Financial Innovation, 2026, 12(1), 65.
14. Thai H. M & Huong G. N. T. Determinants of Digital Asset Volatility: A Literature Review. The Future of Accounting and Finance, 2025, 333-35.
15. Zhu K, Wu F, Wang F, Shen T, Wu H, Xue B & Liu Y. Blockchain-based digital asset circulation: A survey and future challenges. Symmetry, 2024, 16(10), 1287. https://doi.org/10.3390/sym16101287
16. Zhang C, Zhu Y & Zhang L. Effect of digital inclusive finance on common prosperity and the underlying mechanisms. International Review of Financial Analysis, 2024, 91, 102940.