International Journal of World Economic Research
ISSN: 3080-9886 (Print), ISSN: 3080-9894 (Online) | Vol. 1, No. 3, 2026

Research on the Mechanism of Digital Finance Empowering New Quality Productivity

Yong Luo *, Qiaomu Li

School of Economics, Management and Law, University of South China, Hengyang, 421001, P.R. China

Abstract: With the deepening development of the digital economy, digital finance, as a critical enabling factor, has played an increasingly important role in optimizing resource allocation, stimulating technological innovation, and driving industrial transformation, thereby exerting a systematic impact on the formation and evolution of new-type productivity. Based on an integration of cutting-edge domestic and international theories and empirical studies, this paper constructs a multi-path framework elucidating how digital finance empowers new-type productivity. It systematically identifies five dimensions through which digital finance promotes qualitative upgrades in productivity: reorganization of capital and optimization of resource allocation, support for technological innovation and cultivation of innovation ecosystems, industrial upgrading and intelligent transformation, enhancement of risk governance capacity, and valorization of data assets alongside organizational restructuring. Furthermore, the study proposes a bidirectional feedback model between digital finance and new-type productivity, emphasizing their symbiotic evolution within a "technology–finance–industry" triadic interaction. The findings indicate that digital finance provides a stable, efficient, and resilient driving force for the sustained development of new-type productivity through systemic mechanisms, synergistic pathways, and ecosystem-based networks. Theoretically, the paper deepens the conceptual understanding of new-type productivity and extends the analytical boundaries of digital finance research; practically, it offers systematic policy and industrial-finance integration insights.

Keywords: Digital finance, New-type productivity, Mechanism, Interaction.

1. Introduction

As the digital economy enters a new stage, digital technologies are profoundly reshaping economic logic, industrial organization, and social production relations. Digital finance, as a deep application of digital technologies in the financial sector, not only transcends the spatial and temporal boundaries of traditional financial services but also plays a pivotal role in resource allocation, innovation incentives, and structural transformation. Amid China's transition toward high-quality development, the concept of "new-type productivity" has been formally proposed as a core driver of future competitiveness, rapidly attracting scholarly and policy attention. New-type productivity is driven by technological innovation and characterized by green, intelligent, and integrative development, with its formation and evolution highly dependent on the systemic embedding of digital technology, data assets, and institutional innovation. In this context, digital finance serves as a crucial bridge linking technological innovation with the real economy, emerging as a foundational infrastructure for nurturing and sustaining new-type productivity.

With the continuous evolution of productivity theory, the economic functions of digital finance have gone beyond traditional efficiency optimization, extending to the stimulation of innovation, promotion of industrial upgrading, optimization of resource allocation, and enhancement of economic governance. Its unique advantages in alleviating information asymmetry, reducing innovation costs, and improving factor liquidity provide indispensable support for the emergence of new-type productivity. Particularly, in the context of data being recognized as a new production factor, digital finance's capabilities in data collection, processing, pricing, and assetization underscore its strategic role within the new-type productivity ecosystem.

Although abundant studies have explored the impacts of digital finance on economic growth, regional development, inclusive finance, and industrial structure, systematic investigations into its intrinsic relationship with new-type productivity remain nascent. Existing research often emphasizes empirical analysis or policy interpretation, lacking an integrated theoretical framework explaining the mechanisms at play. Especially after the formal introduction of the new-type productivity concept, a key research gap lies in systematically linking the technical characteristics and operational logic of digital finance with the essential attributes of new-type productivity to construct a theoretically robust and forward-looking framework.

This paper aims to systematically clarify the theoretical logic and practical pathways through which digital finance empowers new-type productivity, constructing a multi-dimensional, dynamic feedback framework. By examining systemic interactions, synergistic pathways, and institutional adaptations, this study not only enriches the theoretical system of new-type productivity and extends the scope of digital finance research but also provides policy guidance for promoting deep integration between finance and the real economy under the digital economy.

2. Literature Review

The interactive mechanism between digital finance and new-type productivity has increasingly attracted academic attention. From an international perspective, financial development theories have long focused on the links among financial structure, efficiency, and economic growth. Levine (2005) argues that financial systems enhance total factor productivity growth by reducing transaction costs, optimizing resource allocation, and incentivizing innovation, providing a theoretical foundation for understanding the productivity-enhancing effects of digital finance. With ongoing

technological revolutions, the role of digitalized factors in financial systems has gained prominence [1]. Philippon (2016) proposed the "FinTech opportunity framework," highlighting that digital financial services can achieve financing and payment functions more efficiently and at lower cost, with core advantages arising from enhanced data-processing capabilities and decentralized intermediary structures [2]. This framework offers a critical perspective for exploring how digital finance drives innovation and reorganizes production factors.

In terms of productivity theory, technological breakthroughs are widely regarded as the core driver of new-type productivity. Romer (1990) emphasizes that knowledge and technological accumulation exhibit non-rivalry and positive externalities, contributing to economic growth beyond traditional capital factors [3]. Brynjolfsson and McAfee (2014) further argue that digital technologies are leading a "second machine age," with data, algorithms, and intelligent computing reshaping production patterns, giving rise to digitalized, intelligent, and platform-based growth [4]. Acemoglu and Restrepo (2019) analyze labor restructuring under automation, showing that digital technologies profoundly affect production processes and industrial evolution [5]. Collectively, these theories highlight the centrality of technological innovation in generating new-type productivity, providing a theoretical basis for understanding how digital finance enhances productivity via innovation mechanisms.

In the Chinese context, research on new-type productivity emphasizes its conceptual features, core drivers, and formation logic. Studies note that, unlike traditional productivity dependent on capital and labor expansion, new-type productivity is driven by technological innovation, green development, high-quality human capital, and advanced production methods (Zhang & Pu, 2023) [6]. Zhou and Wang (2025) further stress that a financial innovation system comprising technology finance, green finance, and digital finance serves as an important support for new-type productivity by enhancing factor mobility, optimizing innovation ecosystems, and strengthening industrial coordination [7].

Domestic research on digital finance highlights its role in alleviating information asymmetry, easing financing constraints, and strengthening risk identification. Gu and Gao (2023) find that digital inclusive finance encourages enterprises to increase R&D investment [8]; Yi (2024) confirms its positive effects on rural resource allocation and inclusive development [9]; Xu and Zhang et al. (2025) show that technology market development mediates the promotion of new-type productivity, with regional heterogeneity and government intervention exerting significant moderating effects [10]. Chen (2025) identifies five pathways through which digital finance fosters new-type productivity: reducing operating costs, optimizing resource allocation, enhancing production efficiency, unlocking data value, and improving inclusivity, while also noting challenges such as imperfect data property rights, regional imbalances, and lagging regulatory systems [11].

Methodologically, mediation analysis (Baron & Kenny, 1986) [12] and threshold panel regression models (Hansen, 1999) are widely used in domestic studies to identify the regulatory roles of policy and institutional conditions in the impact of digital finance [13]. Overall, the literature recognizes digital finance's critical role in stimulating innovation, optimizing factor allocation, and promoting industrial upgrading. However, a systematic integration of the complete transmission pathway from "digital finance → technological innovation → industrial upgrading → new-type productivity" remains limited, providing space for the unified theoretical framework proposed in this paper.

3. Mechanisms of Digital Finance Empowering New-Type Productivity

As a key component of the digital economy, digital finance reshapes financial supply and service boundaries while exerting systemic influence across resource allocation, innovation ecosystems, industrial restructuring, and economic governance. The formation of new-type productivity depends on holistic advances in technology and production methods, aligning closely with the technical efficacy and institutional advantages of digital finance. Systematically elucidating the mechanisms through which digital finance promotes new-type productivity not only provides a coherent analytical framework but also lays a foundation for policy formulation and empirical research.

The empowerment mechanisms can be summarized in five dimensions: (1) Optimizing capital allocation and financial service structures to improve factor efficiency; (2) Enhancing access to funding and creating supportive innovation environments to stimulate technological innovation; (3)Driving digital transformation of traditional industries and supporting emerging sectors to promote industrial upgrading; (4) Strengthening risk identification and governance capacity to ensure stable innovation and growth; (5) Unlocking the value of data assets and restructuring production organizations. These mechanisms collectively form the core driving system through which digital finance fosters new-type productivity, profoundly impacting factor quality, innovation efficiency, and institutional environments.

3.1. Credit Restructuring and Capital Allocation Efficiency

Enhancing resource allocation efficiency is a fundamental prerequisite for cultivating new-type productivity. Traditional financial systems, relying on collateral-based lending and offline credit evaluation, face significant information-processing bottlenecks when serving small and micro enterprises, long-tail groups, and innovative firms. Digital finance constructs a data-driven credit assessment system that integrates multi-dimensional and dynamic information from transactions, operations, and social networks, enabling real-time, intelligent, and precise credit evaluations. Unlike traditional models, digital finance emphasizes actual economic behaviors and repayment capacities rather than static asset scales, thereby lowering financing thresholds and enhancing capital mobility.

Under digital finance, capital allocation logic shifts from "asset-constrained" to "data-driven," allowing funds to flow more efficiently to active, innovation-capable entities based on dynamic risk profiles. This not only shortens financing matching cycles but also improves enterprises' access to external financing. Algorithm-driven credit and pricing mechanisms further optimize risk–return trade-offs and reduce subjective bias. Moreover, blockchain- and smart contract-enabled supply chain finance significantly enhances the efficiency of capital circulation across industrial chains, increasing transparency and reducing costs.

Digital finance also improves labor and human capital allocation efficiency. Digital payments, e-wallets, and online transaction platforms reduce participation costs in employment and entrepreneurship, facilitating flexible labor mobility across regions, industries, and work modalities. Resource optimization thus extends beyond capital to the integrated coordination of labor and data factors, aligning with new-type productivity's requirement for multi-factor collaboration.

3.2. Financing Support and Innovation Ecosystem Construction

Technological innovation, as the core driver of new-type productivity, demands flexible, adaptive, and continuous financial support. Traditional finance often fails to meet high-tech enterprises' funding needs due to risk aversion, information asymmetry, and uncertainty of innovation outcomes. Digital finance, through innovative financial products, lower financing costs, and diversified funding channels, provides more flexible and multi-dimensional capital sources, alleviating structural constraints such as high R&D expenditure, long payback periods, and financing thresholds.

On one hand, digital finance leverages big data and AI to evaluate firms' R&D activities, technological capabilities, and innovation potential, making innovation value more measurable and reducing lenders' risk concerns. Empirical studies show a significant positive correlation between digital inclusive finance development and enterprise R&D investment and patent output, reflecting its structural incentive effect on innovation. On the other hand, platform-based mechanisms enable the integration and sharing of innovation resources. Crowdfunding, equity crowdfunding, and supply chain collaboration platforms allow innovation projects to access broader, lower-cost capital and resources, particularly supporting high-growth and start-up firms with greater flexibility than traditional finance.

Moreover, technological advancements in digital finance itself—such as privacy-preserving computation, intelligent algorithms, and blockchain—form a critical component of the innovation ecosystem. These technologies not only improve financial service efficiency but also provide transferable tools for breakthroughs in other domains. For instance, digital tools enhance the implementation of green finance and technology finance, facilitating innovation under controlled risk conditions. This "technology-feedback-to-innovation" mechanism constitutes a unique pathway through which digital finance empowers new-type productivity.

3.3. Industrial Structure Optimization and Value Chain Upgrading

Optimizing industrial structure and transforming production modes are key manifestations of new-type productivity. Digital finance contributes not only through financing services but also by leveraging technology and data to promote the evolution of industries toward intelligence and high-end development.

In traditional sectors, digital finance facilitates real-time synchronization of information and capital flows across production, inventory, and logistics by promoting digital payments, smart accounting systems, and supply chain finance platforms, thereby enhancing operational efficiency. Deepened supply chain finance strengthens upstream–downstream coordination, allowing SMEs to integrate into modern industrial chains at lower costs and enhancing overall competitiveness.

For emerging industries, such as new energy, biomedicine, high-end equipment, and advanced materials, digital finance provides tailored financing environments suited to high R&D intensity and uncertainty. Innovative financial instruments and intelligent risk models offer precise and flexible capital support, while blockchain and smart contract technologies strengthen the integration of industrial and innovation chains, promoting a "triple-chain fusion" ecosystem.

Digital finance also reshapes industrial organization. Under platform-based economies, production structures shift from linear hierarchies to open, collaborative networks, and production activities evolve from sequential collaboration to ecosystem symbiosis. The deep integration of finance and industry enables industrial clusters and industrial internet platforms to access higher-quality financial services and data support, accelerating transformation toward intelligent, green, and platform-based development.

3.4. Risk Governance and Macro-Stability Enhancement

The sustainable development of new-type productivity depends not only on technological and industrial breakthroughs but also on stable financial environments and effective risk governance. Digital finance, through intelligent risk control, big data monitoring, and algorithmic modeling, significantly enhances risk identification, early warning, and management, improving the resilience and stability of economic systems.

Digital finance's advantages in risk management derive from comprehensive data dimensions and advanced modeling capabilities. Financial institutions can dynamically capture business anomalies and market fluctuations using real-time data, achieving predictive and precise credit risk monitoring. AI models' ability to detect complex risk patterns in high-dimensional data surpasses traditional linear, historical-data-based approaches, maintaining high forecasting accuracy and response speed under uncertainty.

At the governance level, the rise of regulatory technology (RegTech) provides new paradigms for financial oversight. Algorithms facilitate analysis of complex financial products, enable transparent monitoring, and support real-time supervision, effectively mitigating systemic risk accumulation. Technology also allows policy-making to adapt faster to financial innovation, reducing institutional risk from regulatory lag.

Enhanced risk management creates a stable institutional environment for high-risk innovation. By dispersing, assessing, and mitigating risk, digital finance provides a reliable financial safety net, supporting innovative entities in pursuing frontier exploration within controllable risk parameters.

3.5. Data as a Production Factor and Organizational Innovation

In the new-type productivity system, data has emerged as a key production factor, with its valorization and utilization directly influencing economic modernization. Digital finance is not only a major application scenario for data but also a driver for data assetization, circulation, and governance modernization.

By establishing digital credit systems, transaction data, and payment data platforms, digital finance elevates data from a

supportive record-keeping tool to a strategic resource with credit attributes and market value. Through data processing, algorithmic modeling, and multi-scenario integration, data progressively becomes measurable, tradable, and allocable, achieving the critical transformation of "factor upgrading."

Deep development of data factors improves financial system efficiency and drives fundamental changes in organizational structures. Enterprises can leverage real-time data to perceive, predict, and optimize production processes, shifting management from experience-driven to data-driven decision-making. Efficient data flows along industrial chains promote networked and open organizational structures, transforming the economy from "centralized control" to "distributed collaboration."

The accumulation of data factors and iterative improvements in digital finance technologies jointly propel the economic system toward higher digitalization and intelligence, providing a deep institutional foundation for the formation of new-type productivity.

4. Interaction Model between Digital Finance and New-Type Productivity

Digital finance and new-type productivity do not exhibit a unidirectional linear relationship but form a bidirectional, reinforcing system. Digital finance, as a key enabler, influences productivity via capital supply, technological innovation, and resource allocation, while actively shaping institutional adaptation, organizational change, and industrial ecosystems. In turn, the development of new-type productivity affects digital finance's technological trajectory, business models, and institutional environment, forming a "technology–finance–industry" triadic interaction. Constructing a systematic interaction model is therefore essential for understanding their multidimensional mechanisms and dynamic feedback processes.

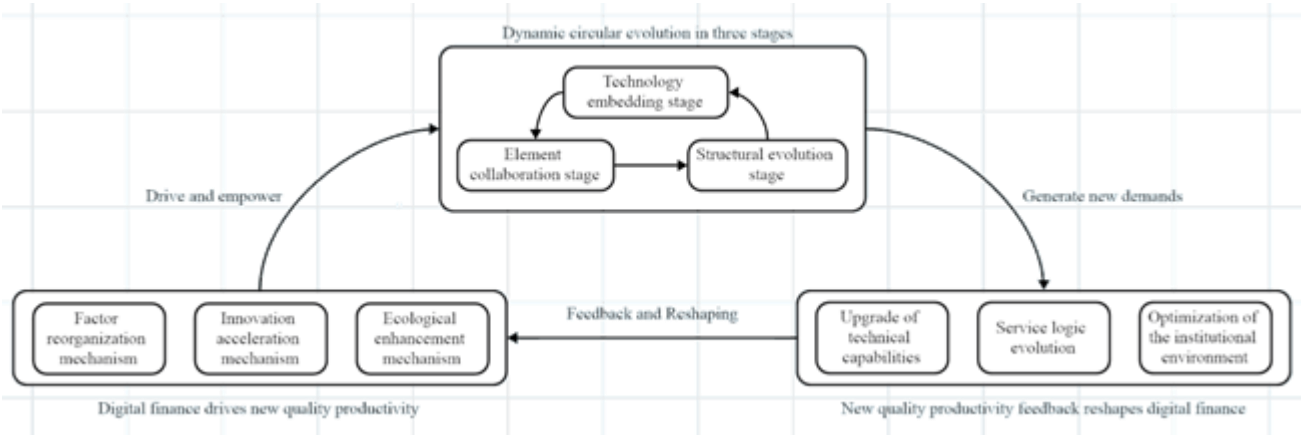

Figure 1. Interactive relationship model

4.1. Mechanisms of Digital Finance Driving New-Type Productivity

Digital finance empowers new-type productivity through three core mechanisms: factor reorganization, innovation acceleration, and ecosystem enhancement.

Factor Reorganization: Digital finance, via data-driven credit evaluation and dynamic pricing, enables high-efficiency coordination and cross-domain flow of capital, labor, and data. Unlike traditional productivity, new-type productivity emphasizes factor quality and structural optimization. Algorithmic risk control, smart contracts, and real-time data processing significantly enhance factor allocation precision and timeliness, driving production from scale expansion to quality improvement.

Innovation Acceleration: Digital finance supports the full innovation cycle, mitigating information asymmetry, optimizing resource matching, and lowering risk premiums, thereby facilitating sustainable innovation incentives and strengthening the technological foundation of new-type productivity.

Ecosystem Enhancement: Digital finance provides systemic support across institutional environments, industrial organizations, and collaborative networks. Blockchain-based trust systems, intelligent regulatory tools, and platform-based services create a transparent, predictable, and secure innovation environment, supporting long-term development.

These mechanisms indicate that digital finance's empowerment of new-type productivity is multidimensional and systemic, integrating technology, institutions, and organization.

4.2. Feedback and Reshaping from New-Type Productivity to Digital Finance

New-type productivity is not a passive recipient of digital finance. Its embedded technological characteristics actively drive the evolution of financial systems. Feedback occurs across:

Technology: Intelligent and knowledge-intensive features of new-type productivity demand more precise valuation models, advanced privacy-preserving computation, and dynamic risk assessment tools.

Service Logic: Financial services shift from standardized to scenario-based, customized, and real-time offerings, embedding deeply into industrial processes.

Institution: Technological iteration and business innovation challenge traditional regulation, requiring regulatory technology and dynamic monitoring to balance financial stability with innovation.

4.3. Dynamic Feedback Model

A "dynamic feedback model" includes three stages: technology embedding, factor coordination, and structural evolution. Technology embedding integrates digital financial services into production processes, reducing transaction and innovation costs. Factor coordination activates data, capital, talent, and technology, forming synergistic networks. Structural evolution transforms industrial, governance, and market organization over time. These stages operate in

continuous cycles, reinforcing each other: technology embedding enables factor coordination, which drives structural evolution, generating new technological demands that further upgrade digital finance, forming a loop: Digital Finance → New-Type Productivity → Technological Evolution → Digital Finance Upgrade.

4.4. Theoretical Implications

This model has three theoretical implications: (1) Digital finance is an integral component, not an external adjunct, of new-type productivity, highlighting mutual embedding and co-shaping. (2) Development of new-type productivity transforms digital finance from a service tool into a composite of technology, institutions, and ecosystem. (3) The relationship is dynamic and phased, offering an evolutionary lens for structural changes in the digital economy.

5. Conclusions and Policy Implications

Digital finance plays a systemic role in fostering new-type productivity. This study elucidates multi-dimensional mechanisms and identifies digital finance as a critical enabler. To promote effective interaction, policy should focus on four dimensions: infrastructure, technological integration, industrial guidance, and risk governance.

Strengthen Infrastructure and Data Governance: Coordinate construction of digital payment systems, big data platforms, blockchain networks, and AI infrastructure to enable safe, efficient circulation of data assets, providing a solid foundation for new-type productivity.

Deepen Integration with Technological Innovation: Expand supply chain finance, R&D financing, and equity crowdfunding, lowering financing thresholds and risk costs for innovators. Establish collaborative networks covering capital, technology, and talent to accelerate conversion of scientific achievements into productivity.

Guide Industrial Structure Optimization and Intelligent Transformation: Channel financial resources to strategic emerging industries, green and low-carbon sectors, and smart manufacturing. Support upstream–downstream data integration and collaborative operations, promoting transformation from linear chains to open ecosystems, enhancing productivity and industrial competitiveness.

Establish Risk Governance Systems Compatible with Digital Finance: Introduce intelligent risk models, strengthen regulatory technology, and explore innovative supervisory tools to improve identification, early warning, and handling of new financial risks. Promote regional coordination and differentiated policies to build infrastructure in less-developed areas, creating a system where technology, factors, industry, and institutions reinforce each other, achieving sustainable digital finance–productivity interaction.

References

[1] Levine R. Finance and growth: theory and evidence [J]. Handbook of economic growth, 2005, 1: 865-934.

[2] Philippon T. The fintech opportunity [R]. National Bureau of Economic Research, 2016.

[3] Romer P M. Endogenous technological change [J]. Journal of political Economy, 1990, 98(5, Part 2): S71-S102.

[4] Brynjolfsson E, McAfee A. The second machine age: Work, progress, and prosperity in a time of brilliant technologies [M]. WW Norton & company, 2014.

[5] Acemoglu D, Restrepo P. Automation and new tasks: How technology displaces and reinstates labor [J]. Journal of economic perspectives, 2019, 33(2): 3-30.

[6] ZHANG Lin, PU Qingping. The connotation characteristic, theoretical innovation and value implication of new quality productivity [J]. Journal of Magnesium and Alloy, 2024, 29(6): 137-148.

[7] Zhou J, Wang Y. Research on the Configuration Paths of New Quality Productive Forces Driven by Science and Technology Finance Ecosystem [J]. Sustainability, 2025, 17(20): 9310.

[8] Gu F, Gao J, Zhu X, et al. The impact of digital inclusive finance on SMEs' technological innovation activities—Empirical analysis based on the data of new third board enterprises [J]. Plos one, 2023, 18(11): e0293500.

[9] Yi S, Qi Y, Ya Y, et al. The impact of China's digital inclusive financial development gap on the optimization of rural consumption structure [J]. Plos one, 2024, 19(8): e0308412.

[10] Xu Y, Zhang S. Digital Finance, New Quality Productive Forces, and Government Environmental Governance: Empirical Evidence from Chinese Provincial Panel Data [J]. International Journal of Financial Studies, 2025, 13(3): 129.

[11] Chen Y. Research on the Influence Mechanism of Digital Finance on the New Quality Productive Forces of Enterprises [C]//SHS Web of Conferences. EDP Sciences, 2025, 218: 01002.

[12] Baron R M, Kenny D A. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations [J]. Journal of personality and social psychology, 1986, 51(6): 1173.

[13] Hansen B E. Threshold effects in non-dynamic panels: Estimation, testing, and inference [J]. Journal of econometrics, 1999, 93(2): 345-368.