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Regional Reconstruction of Financial Resources in the Digital Era: A Path of Multi-Dimensional Collaboration and Innovation-Driven Development

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ABSTRACT
Based on the deep penetration of digital technology, this paper systematically explores the new paradigm of coordinated development of finance and regional economy. By constructing a three-dimensional analytical framework of technology-system-space, the internal logic of the cross-regional flow of financial resources is revealed, and combined with typical cases such as the Yangtze River Delta digital currency pilot and the cross-border financial interconnection between Guangdong, Hong Kong China and Macao China, the impact of financial innovation on regional economic structure optimization and innovation is analyzed and the mechanism of cultivation of innovative ecosystems is probed. In view of the current regional financial gap, policy coordination barriers and other problems, innovative strategies such as building an intelligent financial network and establishing a cross-regional risk sharing mechanism are proposed to provide theoretical support and practical paths for promoting high-quality regional economic development.

KEYWORDS
Digital finance; Regional economic synergy; Fintech; Spatial economics; Collaborative governance

1 The digital revolution reshapes a new theoretical framework for the relationship between finance and regional economy

1.1 New logic of financial resource allocation driven by digital technology

Under the impact of technologies such as blockchain and artificial intelligence, the allocation of financial resources is characterized by decentralization. The programmability of digital currency breaks the geographical constraints of traditional financial institutions, and smart contracts realize the automatic allocation and supervision of funds. Taking the supply chain financial platform built by Ant Chain as an example, it relies on blockchain technology to make the information in the supply chain more transparent, reduce information asymmetry, and enhance the financing efficiency of small and micro enterprises in the central and western regions by 60%, which verifies the breakthrough effect of digital technology on regional financial service coverage. In the past, small and micro enterprises in the central and western regions had many difficulties in financing due to problems such as opaque information and insufficient collateral. Ant Chain Supply Chain Finance Platform stores the transaction data of relevant enterprises on the chain. Financial institutions can view the real transaction status of enterprises in real time, so they can lend with confidence, allowing these small and micro enterprises to obtain financial support in a timely manner and carry out production and operation activities.

From the theoretical model, the allocation of traditional financial resources depends on the credit intermediary function of financial intermediaries. Funds flow from the surplus side to the shortage side through banks and other intermediaries, which leads to high transaction costs and information asymmetry. In the era of digital finance, with the help of distributed ledger technology, both capital supply and demand parties can directly match and trade on the network platform, greatly reducing transaction costs and improving allocation efficiency. According to relevant empirical research, in areas where digital financial services are introduced, the financing cost of small and micro enterprises has been reduced by 15%-20% on average, which strongly supports the development of the real economy in the region.

1.2 New forms of financial agglomeration from the perspective of spatial economics

Digital technology has weakened the constraints imposed by geographical distance on financial activities, but has strengthened the spatial agglomeration effect of data elements. Traditional financial clusters such as Beijing Financial Street and Shanghai Lujiazui Financial District have formed a new type of financial cluster of "physical space + digital ecology" through digital transformation. In these areas, a large number of financial institutions have converged, and at the same time, cloud computing, big data and other technologies have been used to build a digital operation system and realize the efficient operation of financial business. Spatial econometric analysis shows that for every 1% enhancement in digital infrastructure, the efficiency of inter-regional financial resource flow increases by 0.87%. This is because a sound digital infrastructure, such as high-speed and stable networks and advanced data centers, enables financial institutions to process and transmit financial data more quickly, realizes the rapid deployment of funds, and promotes the flow of financial resources between different regions.

Analyzed from the perspective of agglomeration theory, financial agglomeration is no longer solely dependent on geographic proximity. Actually, digital technology allows financial institutions to achieve resource sharing and synergistic cooperation in a wider spatial scope. For example, financial institutions in Shanghai Lujiazui Financial District can conduct real-time transactions and information interactions with global financial markets through digital platforms, and at the same time utilize local data processing and analysis capabilities to make rapid responses to financial market dynamics, further consolidating their financial clustering position. This new type of financial cluster not only enhances the regional financial competitiveness, but also stimulates the financial development of neighboring regions through the spillover effect.

1.3 Interaction mechanism between institutional innovation and regional financial development

Pilot zones for institutional innovation, such as the Pilot Free Trade Zone and the Guangdong-Hong Kong China -Macao China Greater Bay Area, have built differentiated financial ecologies through policy breakthroughs such as the cross-border financial regulatory sandbox and the pilot capital account convertibility. The cross-border RMB loan pilot in Qianhai, Shenzhen, has lowered the cost of enterprise financing by 1.5-2 percentage points, verifying the empowering effect of system innovation on the regional economy. In the cross-border RMB loan pilot, enterprises can more conveniently obtain low-cost RMB funds from Hong Kong China and other offshore markets, which broadens their financing channels, reduces their financing costs and enhances their market competitiveness.

There is a dynamic relationship between institutional innovation and financial development that promotes each other. A reasonable financial system can provide a favorable environment for financial innovation and encourage financial institutions to develop new financial products and services to meet the diversified needs of regional economic development. The development of financial innovation will in turn promote the further improvement of the system. When new financial businesses and modes emerge, the original regulatory system may not be able to fully adapt, which prompts the regulators to adjust and innovate the regulatory system to better regulate and guide financial development.

2 Typical practices and effectiveness of financial support for regional economic development

2.1 Digital financial integration practices in the Yangtze River Delta

In 2025, the digital RMB pilot showed a trend of multiple breakthrough, with Shanghai, Zhejiang, Shandong and other places releasing special policies one after another, forming differentiated innovation paths in cross-border payment, premiere economy, government affairs and people's livelihood and other scenarios. Central Bank data show that as of the end of April 2025, the cumulative transaction volume in the pilot area exceeded 5.8 trillion yuan, and the accelerating commercialization of smart contracts, digital currency bridges and other technologies marked the entry of China ' s legal digital currency into the key stage of ecosystem construction. In the digital RMB red packet pilot, consumption was stimulated through the issuance of red packets, while more consumers and merchants became familiar with and accepted digital RMB as a new payment method. According to a June 27, 2022 report from *the International Financial News*, Meituan data shows that from May 30 to June 19, 2022, users who signed up for Shenzhen's digital RMB red packet campaign have used digital RMB to consume at more than 52,000 Meituan merchants. The order volume and order value of these merchants on the Meituan platform increased by 58.9% and 64.6% respectively compared to the same period last year. The recovery of thousands of merchants like Yuanchu Foods shows that digital RMB is playing a role in promoting consumption, boosting the value of the entity, and igniting the vitality of small and medium-sized merchants. The real-time clearing function of the digital bill platform has accelerated the return of funds to enterprises and greatly improved the efficiency of the use of corporate funds. From the perspective of the theory of regional synergistic development, the practice of digital financial integration in the Yangtze River Delta breaks down the financial barriers between regions by building a unified digital financial infrastructure and service system, promotes the free flow and optimal allocation of financial resources in the region, and realizes the synergistic development of finance and economy in the region.

2.2 Cross-border financial innovation in Guangdong, Hong Kong China and Macao China

After the opening of the Cross-bouadary Wealth Management Connect business, according to a report on May 2025 from the Guangdong Branch of the People's Bank of China, 34 banks and 14 securities companies have reported to handle cross-border Wealth Management Connect fund remittance business. As of the end of May 2025, domestic banks have handled the Cross-border Wealth Management Connect fund remittance of 110.574 billion yuan, and domestic securities companies have handled the Cross-border Wealth Management Connect fund remittance of 4.461 billion yuan, achieving the facilitation of cross-border investment for residents in Guangdong, Hong Kong China and Macao China. China Securities Journal reported that as of July 2, 2024, the number of ETFs that have been included in the Internet has reached more than 150, and the turnover has steadily increased. The total trading volume of northbound capital is approaching 250 billion yuan, while that of southbound capital has exceeded 820 billion yuan. As of the end of the first half of 2024, the total scale of ETF Connect will exceed 1.7 trillion yuan, promoting the deep integration of the mainland capital market and better leveraging the core functions of the Hong Kong China market in integrating and linking the mainland market and overseas markets. In addition, Hong Kong China Asset managers in the market generally have relatively rich overseas investment experience, which can better protect the fund security of mainland investors. Cross-border Wealth Management Connect enables residents in Guangdong, Hong Kong China and Macao China to invest in wealth management products in each other's regions, broadening investment channels and increasing residents' property income. The Shenzhen-Hong Kong China ETF interoperability mechanism makes it easier for investors from both places to invest in high-quality ETFs in each other's markets, improving the liquidity and activity of the market. Guangdong-Hong Kong China-Macau Greater Bay Area's cross-border financial innovation is a useful exploration to give full play to the advantages of Hong Kong China and Macao China as international financial centers and the vast market advantages of the mainland under the framework of one country, two systems. Through financial innovation, the connection and interaction of financial markets in the Greater Bay Area have been strengthened, the free flow of funds, talents and other factors has been promoted, which has injected a strong impetus into the economic development of the Greater Bay Area and provided valuable experience for cross-border financial cooperation in other regions.

2.3 Practice of financial technology empowerment in central and western regions

Relying on the advantages of big data industry, Guizhou has built the country's first provincial-level green financial cloud platform to realize online trading of carbon financial products. The Jiaozi Zhigu financial technology industrial park built in Chengdu has attracted leading enterprises such as Ant Group and JD.COM Digital to settle in, driving the local financial technology output value to increase by 28% annually.

Guizhou's green finance cloud platform uses big data technology to evaluate and screen the green projects of enterprises and provide them with accurate financial support. The construction of Chengdu Jiaozi Zhigu Financial Technology Industrial Park has formed an industrial agglomeration effect, attracted a large number of financial technology talents and enterprises, and promoted technological innovation and knowledge dissemination. The practice of financial technology empowerment in the central and western regions is an effective way to achieve economic transformation and upgrading through the development of financial technology based on local resources and industrial foundation. Using financial technology, the central and western regions can break through the limitations of traditional financial services, improve the coverage and efficiency of financial services, provide more convenient and efficient financial services for local enterprises and residents, and promote the high-quality development of regional economy.

3 The practical dilemma faced by regional financial development

3.1 Regional financial inequality exacerbated by digital divide

According to Peking University's Digital Financial Inclusion Index, in 2020, China's eastern region's digital financial inclusion index was 67.2, the central region reached 54.6, and the western region was 49.8, with the gap between the east and west reaching 17.4%, and the gap between the central and western regions reaching 4.8%. The mobile payment coverage rate in rural areas is much lower than that in cities, China Business News in: PwC side has issued an article pointing out that the shortage of fintech talents has exceeded 1.5 million, and the talents who can organically combine the technical ability with the financial needs are even rarer. From the perspective of economic development theory, the digital divide exacerbates regional financial inequality, which will further widen the gap in regional economic development and form a vicious circle. Financial development in the eastern region promotes economic growth, which in turn has more resources to invest in digital infrastructure construction and fintech development, while the western region is caught in the predicament of lagging financial development and weak economic growth.

3.2 Lack of cross-regional financial synergy mechanisms

There are obvious administrative barriers in the allocation of financial resources in the Beijing-Tianjin-Hebei region, with Beijing accounting for 72% of financial assets, while Zhangjiakou and other eco-functional zones have insufficient financial support. The lack of cross-regional financial supervision and coordination mechanisms has led to cross-regional transmission of risks such as illegal fund-raising. The lack of a cross-regional financial coordination mechanism hinders the rational allocation and free flow of financial resources within the region, reduces the overall efficiency of financial services, increases financial risks, and is not conducive to the synergistic development of the regional economy. The establishment of a sound cross-regional financial synergy mechanism is the key to promoting regional financial integration and realizing coordinated regional economic development.

3.3 Mismatch between traditional financial supply and new economy demand

More than 70% of the R&D funds of the Sci-Tech enterprises come from venture capital rather than bank loans. However, the number of venture capital institutions in the central and western regions is only 1/5 of that in the east, and the science and technology financial service system is seriously lagging behind. The mismatch between traditional financial supply and new economy demand has constrained the development of new economy enterprises and hindered the transformation and upgrading of the regional economy. Accelerating the construction of a science and technology financial service system adapted to the development needs of the new economy and increasing the supply of innovative financial services such as venture capital is a pressing task to promote the high-quality development of the regional economy.

4 Innovative paths for financial empowerment of regional economy in the digital era

4.1 Building an intelligent financial resource allocation network

To build an intelligent financial allocation network, we need to adopt many steps, such as to establish a unified national financial technology infrastructure, tp promote the “blockchain + supply chain finance” model, to build a nationwide industrial chain financial service network, and to improve the financing efficiency of small and medium-sized enterprises. At the same time, the interconnection of financial data should be realized, so that financial institutions in different regions can use data from all parties to conduct joint modeling and analysis, and the accuracy of risk assessment and effectiveness of financial services should be improved, too. The “blockchain + supply chain finance” model ensures the authenticity and reliability of transaction information in the supply chain through the characteristics of blockchain, such as non-tampering and traceability. Financial institutions can provide financing services based on accounts receivable and inventory for small and medium-sized enterprises in the supply chain according to this information. Through the blockchain+supply chain finance platform, the accounts receivable of core enterprises will be pledged for financing, which may quickly obtain the funds needed for production and solve the problem of capital turnover. Building a nationwide industrial chain financial service network will enable more small and medium-sized enterprises to integrate into the industrial chain, obtain financial support and promote the coordinated development of the industry.

4.2 Innovating cross-regional financial collaborative governance mechanism

We should establish regional financial coordination committees in the Yangtze River Delta, Guangdong, Hong Kong China and Macao China, establish a mechanism of regulatory data "sharing and joint" law enforcement, explore the issuance of regional coordinated development bonds, and guide financial resources to lean toward weak areas through special refinancing, policy guarantees and other tools.

The Regional Financial Coordination Committee should be composed of representatives from local governments, financial supervision departments, financial institutions, etc., and be responsible for coordi-nating financial development planning, policy formulation and major decision-making in the region. The mechanism of regulatory data sharing+joint law enforcement can strengthen the information exchange and cooperation between financial regulatory departments in different regions, and timely discover and deal with cross-regional financial risks. Issuing regional cooperative development bonds can raise funds for major infrastructure construction, industrial upgrading and other projects in the region and promote the coordinated development of regional economy. Special refinancing can provide low-cost financial support for key industries and projects in economically weak areas, while policy guarantee can reduce the lending risk of financial institutions to enterprises in weak areas and encourage financial institutions to increase credit supply to these areas.

4.3 Cultivating the scenario-based financial service ecosystem

We are piloting the “urban computing platform + digital twin” financial service in Xiongan New Area to realize the whole life cycle financing management of infrastructure projects. Relying on the Hainan Free Trade Port, it will carry out cross-border digital asset trading, offshore finance and other innovative businesses to build a regional financial hub for ASEAN. In the “Urban Computing Platform + Digital Twin” financial service pilot project in Xiongan New Area, the planning, construction and operation of urban infrastructure construction projects are digitized through the construction of urban digital twin models. Based on this information, financial institutions can provide accurate financing solutions for the projects, realizing the financing management of the whole life cycle from the land development loan in the early stage of the project, to the engineering loan during the construction process, and then to the operational loan in the operation stage. Digital technology is restructuring the interaction mode between finance and regional economy, forming a new paradigm of synergistic development of "technological innovation- institutional breakthrough- spatial reconstruction". In the future, it is necessary to strengthen the construction of digital infrastructure, innovate the mechanism of regional financial governance, and cultivate the characteristic financial service ecology, so as to promote the optimal allocation of financial resources on a larger spatial scale. It is recommended to establish a dynamic monitoring system for regional financial development, and use big data and artificial intelligence technology to carry out policy effect assessment, so as to provide a scientific basis for the formulation of differentiated financial policies.

Through the theoretical and practical analysis of finance and regional economic development, we have deeply realized the great role of financial innovation in promoting regional economic development in the digital era. However, the current regional financial development still faces many challenges, which requires the joint efforts of the government, financial institutions and all parties in society. Strengthening digital infrastructure construction is the basis for narrowing the digital divide and promoting balanced regional financial development. Innovating regional financial governance mechanisms is the key to breaking down administrative barriers, preventing financial risks and realizing synergistic regional financial development. Cultivating a distinctive financial service ecology is an important way to meet the needs of different regional economic development and promote economic transformation and upgrading.

The establishment of a dynamic monitoring system for regional financial development can grasp the status of regional financial development in real time and identify problems and potential risks in a timely manner. The use of big data and artificial intelligence technology to carry out policy effect assessment can more scientifically analyze the impact of financial policies on regional economic development and provide data support and decision-making basis for the government to formulate more accurate and effective differentiated financial policies. Only through continuous exploration and innovation can we give full play to the core role of finance in the high-quality development of regional economy and realize the coordinated and sustainable development of regional economy.

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