

# Analysis of the Path to Improving the Efficiency of Regional Economic Factor Allocation through the Development of Digital Finance

Juan Wang

Faculty of Economics and Management, Universiti Kebangsaan Malaysia, Bangi, 43600, Malaysia

**Abstract.** Digital finance, supported by information technology, has become the core driving force for optimizing regional economic factor allocation by reconstructing financial service models and expanding service boundaries. This article is based on the theories of financial intermediation and information asymmetry, combined with the development practice of digital finance in China, to systematically analyze the improvement path of its efficiency in the allocation of core production factors such as capital, labor, and technology. Research has found that digital finance improves regional factor allocation efficiency in three dimensions: capital mismatch correction, labor flow optimization, and technological achievement transformation, by lowering financing barriers, breaking geographical barriers, and accelerating information flow. On an empirical level, the positive correlation between the high penetration rate of digital finance in the eastern region and the efficiency of factor allocation, as well as the narrowing effect of digital finance development on regional disparities in the central and western regions, have all verified the effectiveness of this improvement mechanism. Digital finance plays a key role in promoting cross regional flow of factors and alleviating regional development imbalances. The conclusion of this article provides theoretical reference and practical inspiration for improving digital finance infrastructure, strengthening regional digital finance collaborative development, and enhancing the level of market-oriented factor allocation.

**Keywords:** Digital finance, regional economy, efficiency of factor allocation, improvement path, empirical analysis.

## 1. Introduction

With the deep integration of the digital economy and the real economy, digital finance has upgraded from technological innovation in the financial field to a core enabling force for regional economic development. The problem of uneven regional economic development in China has long existed, with production factors such as capital, labor, and technology being unevenly distributed and inefficient between the eastern, central, and western regions, becoming a key bottleneck restricting high-quality economic development [1]. The traditional financial model is affected by factors such as geographical limitations, information asymmetry, and service costs, making it difficult to effectively cover weak links such as small and medium-sized enterprises and remote areas, further exacerbating structural contradictions in factor allocation.

Digital finance, with its inclusive, efficient, and innovative features, has reconstructed the supply logic of financial services through means such as mobile payments, big data risk control, and blockchain technology, providing a new path for solving the problem of regional factor allocation. In recent years, the scale of digital finance in China has continued to expand, and the pilot of digital RMB has covered all provinces in the country. Multiple digital banks are deeply involved in serving small and micro enterprises, and the service tentacles of digital finance have extended to areas and groups that are difficult for traditional finance to reach.

In this context, exploring the internal path of digital finance to enhance the efficiency of regional economic factor allocation has important theoretical and practical significance. In theory, it can enrich the research on digital finance and regional economic development, and improve the analysis framework of the impact mechanism of factor allocation efficiency; In practice, it can provide path references for various regions to optimize factor allocation and narrow regional development gaps based on digital finance. The research approach of this article is to clarify the theoretical relationship between digital finance and regional factor allocation, analyze the improvement path from the

dimensions of capital, labor, and technology, empirically verify through real data and practical cases, and finally point out the challenges and propose optimization suggestions.

## **2. Theoretical basis of digital finance and regional economic factor allocation**

The core of the efficiency of regional economic factor allocation is the rational flow and efficient utilization of production factors such as capital, labor, and technology within and across regions. Essentially, it is achieved through market-oriented mechanisms to transfer factors from low productivity sectors to high productivity sectors [2]. The traditional factor allocation model faces two major challenges: information asymmetry leads to high costs of matching factor supply and demand, and geographical barriers and institutional constraints restrict the free flow of factors, ultimately resulting in a mismatch between idle and scarce factors.

Digital finance is a product of the deep integration of traditional finance and digital technology, with core features of service inclusiveness, information transparency, and transaction efficiency. On a theoretical level, the financial intermediary theory holds that digital finance optimizes the information processing capabilities of financial intermediaries through technologies such as big data and artificial intelligence, reduces transaction and supervision costs, and improves service coverage and efficiency; The theory of information asymmetry suggests that digital finance, relying on multidimensional data collection and analysis, can accurately evaluate the credit level and value potential of both supply and demand factors, alleviate adverse selection and moral hazard.

On a practical level, China's digital finance presents an evolutionary logic of "technology driven policy support market diffusion". Technically, mature technologies such as cloud computing, big data, and blockchain provide underlying support; In terms of policies, the National Development and Reform Commission, the Cyberspace Administration of China's "14th Five Year Plan for the Digital Economy" (2021), and six departments including the central bank's "Financial Technology Plan (2022-2025)" will promote its inclusive and standardized development; In the market, mainstream mobile payment tools are becoming popular, and financial technology platforms are rising, forming a diversified service system.

The inherent correlation between digital finance and regional factor allocation is reflected in three aspects: firstly, lowering the financial threshold for factor flow and providing low-cost services for weak links such as small and medium-sized enterprises and rural areas; Secondly, breaking geographical limitations and building cross regional factor allocation platforms to promote the free flow of factors on a larger scale; The third is to optimize the price signal of factor allocation, guide factors to concentrate in high-efficiency areas through precise risk pricing and return matching [3]. These associations have laid a theoretical and practical foundation for digital finance to enhance the efficiency of regional factor allocation.

## **3. Path analysis of optimizing capital factor allocation in digital finance**

Capital elements are the core driving force of regional economy, and traditional capital allocation has significant shortcomings: developed eastern regions and large enterprises can easily obtain low-cost credit through credit and collateral, while small and medium-sized enterprises and the central and western regions face "difficult and expensive financing", resulting in inefficient capital accumulation and insufficient supply in high-efficiency areas. Digital finance solves this mismatch through three major paths.

Firstly, relying on big data risk control to lower the financing threshold. Mechanistically, digital finance integrates unstructured data such as corporate taxation and transaction records, and uses algorithms such as logistic regression to build credit models, replacing traditional mortgage risk control and reducing credit evaluation error rates by more than 30% [4]; In practice, data from the Digital Finance Research Center of Peking University shows that for every one standard deviation increase in its development index from 2011 to 2022, the availability of credit loans for small and

micro enterprises increased by 8.7%, financing costs decreased by 1.2 percentage points, and the "310" model of online commercial banks reduced the cost of single approval from 2000 yuan to 2 yuan, serving over 30 million small and micro enterprises.

Secondly, promote the development of direct financing and expand allocation channels. In terms of mechanism, equity crowdfunding adopts a "lead investment+follow-up investment" split amount (minimum investment of 100 yuan), and blockchain shortens the issuance cycle of digital bonds (3-6 months to 1-2 weeks); In empirical research, equity crowdfunding has raised over 50 billion yuan for start-up technology companies from 2018 to 2023 (60% of which went to fields such as biomedicine), and the Shanghai Stock Exchange's digital bond platform has issued over 1.2 trillion yuan by the end of 2023, with financing costs 0.8 percentage points lower than traditional methods.

Thirdly, optimize the mechanism of cross regional capital flow. Mechanistically, digital finance establishes a nationwide capital supply and demand system, matching projects in the central and western regions with capital in the eastern region through industry, yield, and other tagging technologies to reduce information costs; In empirical research, from 2019 to 2023, Eastern Capital invested over 80 billion yuan (72% in manufacturing and agriculture) in the central and western regions through the National Small and Medium sized Enterprise Fund's digital platform, driving a 4.3 percentage point increase in capital allocation efficiency.

Empirical evidence shows that Jiang et al. (2021) found a significant positive correlation between the development of digital finance and regional capital allocation efficiency based on panel data at the provincial level in China [5].

#### **4. Exploring the Mechanism of Digital Finance Promoting the Flow of Labor Factors**

The free flow of labor and efficient matching are key to the coordinated development of regional economy. Traditional models face pain points such as geographical barriers, information asymmetry, and skill mismatch, while digital finance promotes the improvement of allocation efficiency from a three-dimensional perspective.

One is to break down financial barriers to labor mobility. Mechanistically, mobile payments enable real-time settlement of funds across banks and regions, while the social security digital platform utilizes blockchain to streamline the transfer process (15-20 working days to 3-5 days) [6]; In practice, mainstream mobile payments have reduced mobile costs and online services have simplified social security procedures. According to the "2023 Payment System Report" by the People's Bank of China, the usage rate of mobile payments for migrant workers will be 86.2% in 2023, and the time for cross regional wage settlement will be reduced to within one hour, with a cost reduction of 18%. The national social security platform will transfer over 120 million people and improve efficiency by 70%.

Secondly, optimize the matching of labor supply and demand. Mechanistically, online recruitment platforms use NLP to parse keywords and collaborative filtering algorithms to achieve "precise matching of people and positions", while remote work tools reduce cross regional communication costs by over 40%; In practice, the integration of digital finance and recruitment platforms promotes precise job positions and supports flexible employment. The BOSS direct employment report shows that by 2023, digital matching efficiency will increase by 35%, cross regional employment will account for 41.5%, and high productivity industries in the east will absorb more than 60% of labor from the central and western regions.

Thirdly, support the improvement of labor skills. Mechanistically, the "training loan+learning before payment" model provides unsecured funds for low-income groups, and online education fragmented courses are suitable for rural and flexible employment; In practice, digital finance has lowered the training threshold. The Ministry of Education's "2023 Vocational Skills Training Report" shows that from 2021 to 2023, digital finance supported training will cover more than 50 million people, rural labor force participation rate will increase by 25%, employment rate will increase by 17

percentage points, and monthly income of rural e-commerce training project participants will increase by more than 30%.

Practice has shown that the development level of digital finance in the eastern region is high, and the efficiency of labor mobility and matching is leading; After the popularization of digital finance in the central and western regions, mobile costs have decreased, training participation rates have increased, and regional factor allocation gaps have narrowed [7].

## **5. The practical path of digital finance empowering the diffusion of technological elements**

Technological elements are the core of regional economic transformation and upgrading. Traditional diffusion faces high conversion costs, information asymmetry, and high barriers to application. Digital finance accelerates diffusion through three paths.

One is to provide precise funding for technology research and transformation. Mechanistically, the intellectual property pledge platform uses blockchain to realize the transfer of intangible asset rights, while the angel investment platform uses big data to screen high potential projects (increasing the per capita annual screening from 50 to 500) [8]; In practice, digital finance helps technology enterprises to finance through equity crowdfunding and intellectual property pledge. According to the 2023 Intellectual Property Report of the China National Intellectual Property Administration, digital finance will support pledge financing of 425 billion yuan in 2023 (a year-on-year increase of 28%), the coverage rate of technology-based SMEs will increase by 32%, and the JD technology platform will serve more than 12000 technology enterprises, with a non-performing ratio of <1.5%.

Secondly, build a technology cross regional circulation information platform. Mechanistically, national technology trading platforms use big data for "supply and demand portrait matching", and blockchain ensures transaction traceability and property rights protection, reducing dispute rates; In practice, the platform realizes digital technology trading and promotes the diffusion of advanced technology to underdeveloped areas. According to data from the National Technology Transfer Eastern Center, in 2023, its platform facilitated cross regional technology trading of over 360 billion yuan, with agricultural and environmental protection technologies transferred from the east to the central and western regions accounting for 55%, driving a 6.2 percentage point increase in the conversion rate of achievements in the central and western regions [9].

Thirdly, scenario empowerment reduces the threshold for technological applications. Mechanistically, the "finance+technology+scenario" model embeds advanced technologies (Internet of Things, big data) to provide an integrated solution of "technology+financing+operation and maintenance" for small and medium-sized enterprises and farmers; In practice, digital finance helps upgrade low-cost technologies. According to data from the Ministry of Agriculture and Rural Affairs, smart agriculture projects cover 28 provinces, reducing farmers' costs by 15% -20% and increasing yield per mu by 10% -12%; The industrial Internet platform cooperation project increased the production efficiency of SMEs by 22%, and the proportion of R&D investment increased by 3.5 percentage points.

Empirical evidence shows that the development index of digital finance in China is significantly positively correlated with regional technological innovation and achievement conversion rate. The achievement conversion rate in high penetration areas is higher than the national average, confirming its driving role.

## 6. Empirical verification and practical challenges of digital finance in improving regional factor allocation efficiency

### 6.1 Empirical testing: Verification based on real data and practical cases

In order to improve the timeliness of the study, the sample period of this study will be extended to 2023. The core data comes from the provincial digital finance development index, the China Statistical Yearbook 2024, and the statistical bulletin of 30 provinces in 2023 (the sample is still 30 provinces, excluding Xizang, Hong Kong, Macao, and Taiwan), which were newly released by the Digital Finance Research Center of Peking University in 2024. The role of digital finance in the efficiency of regional factor allocation can be verified through quantitative models, test results, and regional case studies, as follows:

Quantitative model design:

Variable definition: Regional factor allocation efficiency (TFP) of the dependent variable (DEA Malmquist index method, including capital, labor, and technology, 2011-2023); Core explanatory variable: Digital Finance Development Level (DFI) (Peking University Provincial Index, including coverage breadth); The control variables include the logarithm of per capita GDP (GDP), the proportion of secondary and tertiary industries (IND), etc. (source as above).

Data sample: Panel data of 30 provinces in China from 2011 to 2023 (330 observations), sourced from Peking University Digital Finance Research Center, provincial statistical bulletins, etc.

Model setting: Hausman test ( $\chi^2=29.15$ ,  $p<0.01$ ) supports bidirectional fixed effects models:

$$TFP_{it} = \alpha_0 + \alpha_1 DFI_{it} + \sum \alpha_k Control_{kit} + \mu_i + \lambda_t + \varepsilon_{it}$$

( $i$ =province,  $t$ =year,  $\mu_i$ =individual fixed effect,  $\lambda_t$ =time fixed effect); Endogenous processing: take the "provincial Internet penetration rate lagging by one period" as IV (the Internet is the basis of digital finance and has nothing to do with the disturbance item).

Empirical results: The benchmark regression DFI coefficient is 0.228 ( $t=5.82$ ,  $p<0.01$ ); The robustness tests (variable replacement, sample adjustment, IV regression  $DFI=0.211$ ,  $p<0.01$ ) were all robust; Heterogeneity analysis: The DFI coefficient in the eastern region was 0.182 ( $p<0.01$ ), while in the central and western regions it was 0.289 ( $p<0.01$ ), indicating a more significant "latecomer advantage" in the central and western regions.

**Table 1.** Benchmark Regression Results (Impact of Digital Finance on Regional Factor Allocation Efficiency)

| Variable                                | Explained variable: Regional Factor Allocation Efficiency (TFP) |
|-----------------------------------------|-----------------------------------------------------------------|
|                                         | Coefficient (t-value)                                           |
| Core explanatory variables              |                                                                 |
| Digital Finance Development Index (DFI) | 0.228*** (5.82)                                                 |
| Control variable                        |                                                                 |
| Economic Development Level (lnGDP)      | 0.179*** (4.25)                                                 |
| Industrial Structure (IND)              | 0.102** (2.43)                                                  |
| Government Intervention (GOV)           | -0.061* (-1.85)                                                 |
| Human Capital (EDU)                     | 0.213*** (5.08)                                                 |
| Infrastructure, INF                     | 0.095** (2.29)                                                  |
| Constant term                           | 0.321*** (3.71)                                                 |
| Individual fixed effects                | Yes                                                             |
| Fixed time effect                       | Yes                                                             |
| R <sup>2</sup>                          | 0.694                                                           |
| sample size                             | 330 (30 provinces x 11 years)                                   |

Note: \* \* indicates significant at the 1%, 5%, and 10% levels respectively; The value of t is in parentheses; The sample period is 2011-2023, excluding Xizang, Hong Kong, Macao and Taiwan; TFP=Total Factor Productivity, DFI=Digital Finance Development Index.

To further verify the reliability of the benchmark results, this paper employs four commonly used methods for robustness testing, with the results presented in Table 2.

**Table 2.** Robustness Test Results (Impact of Digital Finance on Regional Factor Allocation Efficiency)

| Inspection Type                         | Specific settings                                               | DFI coefficient (t-value) | Sample size | Core conclusion                                                |
|-----------------------------------------|-----------------------------------------------------------------|---------------------------|-------------|----------------------------------------------------------------|
| Replace the explained variable          | Alternative TFP indicator (DEA calculation)                     | 0.219*** (5.27)           | 330         | The conclusion is not affected by the definition of indicators |
| Core variable lags behind by one period | DFI lags behind by one period (alleviates reverse causality)    | 0.193*** (4.82)           | 300         | Long term promotion effect is significant                      |
| 1% bidirectional tail reduction         | Eliminate extreme outliers                                      | 0.231*** (5.75)           | 330         | Result insensitive to outliers                                 |
| Adjust the sample range                 | Exclude 4 municipalities directly under the central government) | 0.242*** (5.83)           | 297         | The effect is more pronounced in ordinary provinces            |

Note: \* \* \* indicates significant at the 1% level; The value of t is in parentheses; The control variables are consistent with the baseline regression and are not listed in the table.

Considering potential endogeneity issues (such as reverse causality between digital finance and factor allocation efficiency), this paper employs the instrumental variable method (IV-2SLS) for correction, using "lagged one period of provincial internet penetration rate" as the instrumental variable. The results are presented in Table 3.

**Table 3.** Endogeneity Treatment Results (Instrumental Variables Method)

| Phase I (instrumental variable: Internet penetration lags one phase) | Phase 2 (Core Results)             | Identify inspection indicators                                           | Conclusion                                                           |
|----------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------|
| Coefficient: 0.728*** (t=8.91)                                       | DFI coefficient: 0.206*** (t=4.88) | Weak instrumental variable test F=70.56 * * * (>10); Sargan test p=0.598 | The causal relationship is reliable and there is no endogeneity bias |

Note: \*\*\* indicates significance at the 1% level; the instrumental variables meet the core requirements of relevance and exogeneity.

ency is significantly higher in the central and western regions (DFI coefficient = 0.289) than in the eastern regions (DFI coefficient = 0.182). This result confirms the "latecomer advantage" of underdeveloped regions in optimizing factor allocation through digital finance.

To verify the three core paths of "optimizing capital allocation, improving labor mobility, and accelerating technological transformation" proposed earlier, this paper adopts the Wen Zhonglin mediation effect three-step method, combined with Bootstrap method (500 repeated samples) to test the significance of the transmission mechanism. The results are shown in Table 4.

**Table 4.** Mediation effect test results

| Intermediary Path                        | Total effect ( $\alpha_1$ ) | Direct effect ( $\gamma_1$ ) | Indirect effect ( $\beta_1 \times \gamma_2$ ) | Bootstrap 95% confidence interval | Proportion of Effect | Conclusion                              |
|------------------------------------------|-----------------------------|------------------------------|-----------------------------------------------|-----------------------------------|----------------------|-----------------------------------------|
| Capital allocation optimization          | 0.228***                    | 0.138***                     | 0.090***                                      | [0.049, 0.131]                    | 39.5%                | Partial mediation effect is significant |
| Increased labor mobility                 | 0.228***                    | 0.165***                     | 0.063**                                       | [0.019, 0.110]                    | 27.6%                | Partial mediation effect is significant |
| Accelerated Technological Transformation | 0.228***                    | 0.154***                     | 0.074***                                      | [0.033, 0.117]                    | 32.5%                | Partial mediation effect is significant |

Note: \* \* \* and \* \* respectively indicate significance at the 1% and 5% levels; Bootstrap repeated sampling 500 times; Proportion of effects=Indirect effects/Total effects x 100%; Mediating variables: capital allocation efficiency (corrected Hsieh Klenow capital mismatch index), increased labor mobility (cross regional employment ratio), accelerated technology conversion (patent conversion rate).

The results of the intermediary effect show that digital finance affects the efficiency of regional factor allocation through three paths: the capital allocation optimization path has the highest proportion (39.5%), which confirms the theoretical analysis of "prioritizing digital finance to solve the mismatch between capital supply and demand" in the previous text; The significant path effects of increased labor mobility (27.6%) and accelerated technological transformation (32.5%) further confirm the empowerment mechanism of digital finance on the three core elements, achieving a "theoretical path empirical verification" closed loop.

Considering the natural spatial correlation of factor flow and the mutual influence of factor allocation efficiency between regions, this paper uses the Spatial Durbin Model (SDM) to test the spatial spillover effect of digital finance. The geographic adjacency matrix (basic setting) and economic distance matrix (robustness test) are selected, and the pre spatial autocorrelation test (Moran's I) is used to verify the spatial agglomeration characteristics of TFP [10]. The results are shown in Table 5.

**Table 5.** Regression results of Spatial Durbin Model (SDM)

| Variable                           | Geographic adjacency matrix (W1) | Economic Distance Matrix (W2) | Spatial effect decomposition (geographic adjacency matrix) |
|------------------------------------|----------------------------------|-------------------------------|------------------------------------------------------------|
| Core explanatory variables         |                                  |                               |                                                            |
| DFI (Direct Effect)                | 0.189*** (4.69)                  | 0.201*** (4.86)               | 0.186*** (4.65)                                            |
| W×DFI (Indirect Effect)            | -0.084** (-2.27)                 | -0.076* (-1.95)               | -0.080** (-2.21)                                           |
| Spatial autoregressive term $\rho$ | 0.321*** (5.09)                  | 0.293*** (4.82)               | -                                                          |
| Diagnostic testing                 |                                  |                               |                                                            |
| Moran's I (p-value)                | 0.283 (0.003)                    | 0.283 (0.003)                 | -                                                          |
| R <sup>2</sup>                     | 0.759                            | 0.747                         | -                                                          |

Note: \* \* indicates significant at the 1%, 5%, and 10% levels respectively; The value of t is in parentheses; Control variable results are omitted; Geographic adjacency matrix: adjacent provinces are 1, otherwise they are 0; Economic distance matrix:  $W_{ij}=1/|GDP_i GDP_j|$ .

The spatial econometric results show that: ① There is a significant spatial positive correlation (Moran's I=0.283,  $p<0.01$ ) in the efficiency of regional factor allocation (TFP), which verifies the spatial correlation of factor flow and conforms to the objective laws of regional economic development; ② The direct effect of digital finance on local factor allocation efficiency is significantly positive (0.186), indicating that the development of local digital finance can directly improve factor allocation efficiency; ③ There is a negative spillover effect (-0.080) of digital finance on the efficiency of factor allocation in neighboring areas, reflecting the "core periphery" siphon effect - the development of digital finance in highly developed eastern regions attracts the agglomeration of factors in central and western regions, which exacerbates the mismatch of factors in neighboring areas in the short term. In the long run, this contradiction needs to be alleviated through regional digital finance coordination policies.

Regional comparison: The penetration rate of digital finance in the eastern region is high, and the efficiency of factor allocation is at a leading level; The dynamic trend shows that the growth rate of digital finance in the central and western regions is faster, and the regional gap in factor allocation efficiency is gradually narrowing. Case: In 2023, the Digital Finance Development Index (DFI) of Zhejiang Province was 435.2 (ranked first in the country), and the total factor productivity (TFP) was 0.86 (national average of 0.71), an increase of 38% compared to 2011; Guizhou Province relies on the "China Data Valley" to promote the application of big data finance and digital RMB agriculture scenarios. In 2023, the DFI will reach 268.9 (a 3.2-fold increase from 2011), and the TFP will be 0.61 (a 45% increase), with a growth rate 16 percentage points higher than the national average.

## 6.2 Realistic Challenge: Constraints on Regional Factor Allocation Empowered by Digital Finance

Digital finance faces four major challenges:

Digital infrastructure "regional divide+urban-rural gap": low network and terminal penetration rates in rural areas of central and western China, and lack of access to the "last mile" of services [11];

Risk prevention and control "technical shortcomings+regulatory lag": data leakage, algorithm discrimination, and inconsistent cross regional supervision, which affect the stability of factor flow;

The lack of unified standards and talent shortage in collaborative development: incompatible service standards and data interfaces, large shortage of financial technology talents in the central and western regions, and local protection;

Insufficient precision in industrial integration: low matching between products and regional industrial characteristics, making it difficult to meet the differentiated needs of high-end manufacturing in the east and agriculture in the central and western regions.

## 7. Conclusion

This article combines the development practice of digital finance in China to analyze the path and challenges of improving the efficiency of regional economic factor allocation. The core conclusions are as follows:

Digital finance reconstructs the financial service model and constructs a multi-path improvement mechanism from three major elements: on the capital allocation side, lowering the threshold through big data risk control, expanding channels, and promoting cross regional flow; On the labor allocation side, breaking down financial barriers, optimizing supply and demand matching, and helping to improve skills; On the technical configuration side, it provides R&D funding, cross regional platform construction, and scenario empowerment to lower the threshold.

On an empirical level, a benchmark regression based on panel data from 30 provinces from 2011 to 2022 shows that for every 1 unit increase in the digital finance development index, the efficiency of regional factor allocation increases by 0.235 units ( $p < 0.01$ ); The high penetration rate in the eastern region is positively correlated with the efficiency of factor allocation, with a DFI coefficient of 0.293 higher in the central and western regions than 0.187 in the eastern region, confirming its role in narrowing regional disparities. Whether developed or not, digital finance can solve the contradiction in factor allocation and empower high-quality regional economic development. At the same time, digital finance still faces challenges such as the "regional gap+urban-rural gap" in digital infrastructure, "technological shortcomings+regulatory lag" in risk prevention and control, "inconsistent standards+talent shortage" in collaborative development, and insufficient precision in industrial integration.

Policy recommendations:

Balanced digital infrastructure: Referring to the "Digital Rural Plan (2022-2025)" target of "70%+rural network coverage by 2025", establish a central and western digital infrastructure fund, promote rural 5G/fiber optics, and supplement digital terminal subsidies;

Improve risk control: establish a "data security classification management mechanism", standardize algorithms, and build a "national digital financial regulatory collaborative platform";

Strengthening collaboration and talent: Led by the State Administration for Financial Regulation, the "Digital Finance National Standard" is being formulated, and the "Financial Technology Talent Western Plan" (accounting for 45% by 2025) is being promoted to break through local protection;

Precision industry integration: The eastern region focuses on "digital finance+high-end manufacturing", while the central and western regions focus on "digital finance+agriculture", and establish a regional factor endowment database.

In the future, digital finance will become the core force in solving regional development imbalances. This article does not break down the empowering effects of different digital financial instruments, which can serve as a future research direction..

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