

# Research on the Impact of Digital Inclusive Finance on Rural Revitalization

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**Abstract:** As a region that started early in the development of the digital economy, Zhejiang's digital inclusive finance has effectively promoted rural revitalization by alleviating rural financing difficulties, promoting industrial integration, and effectively promoting rural revitalization. This article uses panel data from Zhejiang Province from 2014 to 2022 to empirically explore the impact and mechanism of digital inclusive finance on rural revitalization in Zhejiang Province. The study uses the entropy weight method to build a comprehensive evaluation index for rural revitalization, and combines it with Peking University's digital inclusive finance index to construct a fixed effects model for regression analysis. Multiple collinearity tests, heteroscedasticity tests, and other analyses are used to ensure the reliability of the model. Research has found that: (1) Digital inclusive finance has a significant promoting effect on rural revitalization; (2) The income gap between urban and rural areas shows a significant negative correlation, and as an important prerequisite for rural revitalization, it is necessary to narrow the urban-rural gap; (3) Although fiscal intervention has shown positive effects, it demonstrates policy synergy with digital finance and needs to enhance resource allocation efficiency. This article provides theoretical support and practical reference for Zhejiang Province to deepen the reform of digital inclusive finance and improve rural revitalization policies. It is suggested to achieve the coordinated promotion of digital finance penetration, precise fiscal investment, and regional differentiated policies, and create a model of digital empowerment for rural revitalization.

**Keywords:** Digital inclusive finance; Rural revitalization; Fixed effects model

**Online publication:** September 17, 2025

## 1. Introduction

The research on the relationship between digital inclusive finance and rural revitalization is based on the real contradiction of imbalanced allocation of financial resources under the dual structure of urban and rural areas in China, and the historical opportunity brought by the digital technology revolution. Rural areas are plagued by the narrow coverage of traditional financial institutions, the continuous rise of service costs, and the incomplete credit evaluation system. A large number of farmers and small and micro business entities are trapped in the dilemma

of difficult and expensive financing. This financial exclusion situation has seriously constrained the development of rural industries and the improvement of people's livelihoods. With the comprehensive implementation of the rural revitalization strategy, the national policy scope has intensively issued documents such as the Plan for Promoting the Development of Inclusive Finance and the Outline of the Digital Rural Development Strategy, which require financial institutions to adopt digital means to innovate service models, break through the obstacles of the last mile of rural finance, and mature the application of technologies such as mobile payment, big data risk control, and blockchain, so that financial services can break through the constraints of geographical space and extend to rural fields with the help of intelligent terminals. This not only reduces operating costs but also achieves multidimensional dynamic evaluation of farmers' credit risks. This technology empowerment not only deeply aligns with the goals of the rural revitalization strategy of prosperous industries, livable ecology, and prosperous life, just like supply chain finance revitalizing characteristic agriculture and digital insurance improving risk resistance, but also has unique value in narrowing the urban-rural digital divide and promoting public service equality. This article takes Zhejiang Province as an example to explore in depth the impact and effects of digital inclusive finance on promoting rural revitalization.

## **2. Literature review**

### **2.1. Research on digital inclusive finance**

With the innovation of digital technology, digital inclusive finance has gradually become a new stage of its evolution. Compared to traditional financial models, digital inclusive finance has shown unique advantages in poverty reduction. Research has shown that digital finance helps households enhance their risk resilience by providing convenient payment, savings, and credit services, especially in rural areas where the widespread use of digital payment tools directly promotes smooth consumption and income growth <sup>[1]</sup>. The latest research further reveals that digital financial platforms, by integrating agricultural production data, provide precise credit support for returning entrepreneurial groups, significantly improving the entrepreneurial activity and employment quality in rural areas <sup>[2]</sup>.

### **2.2. Research on rural industrial revitalization**

Due to the heterogeneity of agricultural development both domestically and internationally, China and other countries have different models of rural industrial development. Under the promotion of agricultural policies in various countries, rural industries are diversifying towards high-value industries. However, there are still problems such as small business entities, fragmented management, and lagging development of industry organizations. Therefore, in the process of revitalizing rural industries, the government needs to formulate relevant industrial policies reasonably to achieve industrial organization <sup>[3]</sup>. Secondly, the subjectivity of farmers in the process of rural industrial revitalization cannot be ignored. Farmers are the foundation of rural social development, and rural industrial revitalization cannot be separated from farmers' rural production, rural culture, and rural governance <sup>[4]</sup>.

### **2.3. The impact of digital inclusive finance on rural industrial revitalization**

Existing research indicates that there is an interactive development mechanism between the digital economy and rural industrial revitalization. The main content includes that digital inclusive finance can alleviate financing constraints in the process of rural industrial revitalization, and rural industrial revitalization provides a broad development space for the digital inclusive finance market <sup>[5]</sup>. Digital inclusive finance has the advantages of

reducing financial supply costs, usage costs, providing convenient insurance services, and transaction methods, which can alleviate rural industrial financing constraints, improve the availability of industrial funds, provide industrial risk protection, and alleviate rural agricultural product transaction constraints. While various rural agricultural business entities generally face different degrees of financial exclusion when seeking financial services, digital inclusive finance based on Internet platform and digital technology has greatly filled the funding gap of various rural industries <sup>[6]</sup>. At the same time, digital inclusive finance integrates emerging financial technology into all aspects of rural industrial production and operation activities, greatly extending the agricultural industry chain and improving agricultural added value <sup>[7]</sup>. At the same time, existing research also points out that digital inclusive finance has a spatial spillover effect on rural industry development. Digital support for digital inclusive finance can make financial services more convenient and practical. With the universality, timeliness, and inclusiveness of Internet information technology, it can overcome geographical barriers, break the barrier boundary of traditional financial constraints, drive financial deepening and agglomeration in surrounding areas, improve the matching of elements required for rural industry development, and promote rural industry development <sup>[8]</sup>.

### **3. Definition and related concepts**

#### **3.1. Digital inclusive finance**

The inclusive financial system is an important innovative model in modern financial development, originating from the inclusive financial framework proposed during the International Year of Microcredit in 2005. Its core is to create a multi-level and inclusive financial environment that covers a wide range, addressing the exclusion of socially and economically vulnerable groups, such as small and micro enterprises, rural residents, and low-income groups, from the traditional financial system. The Blue Book on Inclusive Financial Systems, released by the United Nations in 2006, systematically established its theoretical framework, emphasizing the need to establish innovative mechanisms with flexible systems, differentiated services, and sustainable supply. Through flexible adjustment of financial products and services, the 28 rules of traditional finance can be changed. This system not only includes innovative tools such as digital inclusion and micro credit, but also includes the construction of financial infrastructure networks and the optimization of policy support systems. By lowering the threshold for financial entry and expanding the scope of services, a dynamic balance between accessibility and sustainability of financial services can be achieved <sup>[9]</sup>.

The inclusive financial system has important value in multiple dimensions: at the micro level, it can make it easier for households to obtain financing and stimulate internal development momentum; At the meso level, enhance the financial adaptability of small and medium-sized enterprises throughout their entire lifecycle <sup>[10]</sup>. At the macro level, there is a non-linear transmission relationship between the inclusive finance development index and the poverty reduction effect. As a way to achieve sustainable development goals, inclusive finance alleviates the problem of capital misallocation and reconstructs the mechanism of economic resource allocation. The multifaceted benefits it brings are not only helpful in preventing intergenerational poverty but also reflected in the dual enhancement of inclusive growth and financial ethical values, becoming an important institutional arrangement for promoting balanced socio-economic development.

#### **3.2. Rural revitalization**

Rural industrial revitalization is a complex and important concept that involves various aspects of the rural economy, aiming to increase agricultural output value, optimize industrial structure, enhance rural economic

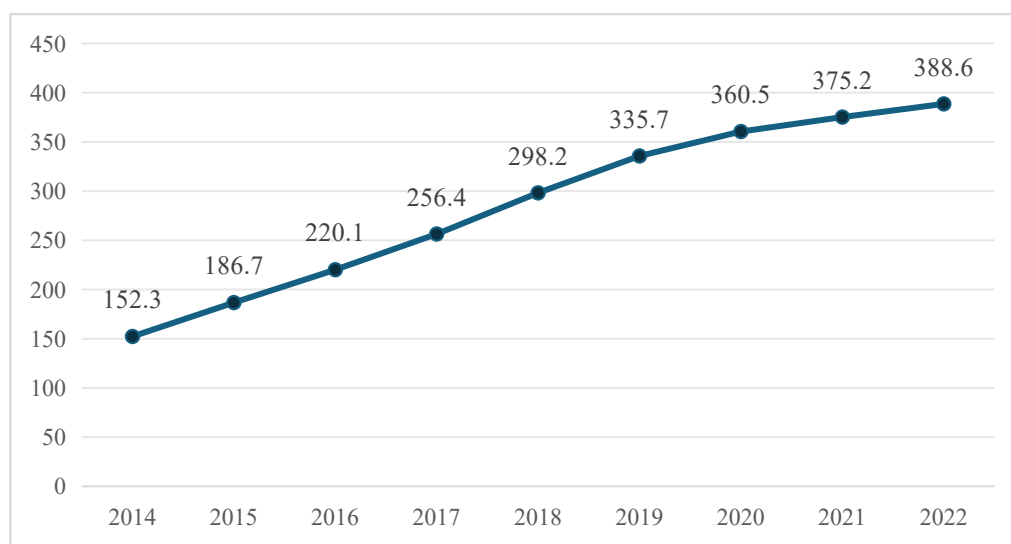
development vitality, and improve the living standards of farmers. Firstly, the revitalization of rural industries emphasizes the development of industries, which means that people must not only focus on the development of the primary industry, namely agriculture, but also pay attention to the development of rural industries and service industries. In terms of agriculture, the revitalization of rural industries requires the promotion of advanced agricultural technologies in rural areas to improve agricultural production efficiency and the added value of agricultural products. In terms of rural industry, the revitalization of rural industries requires guiding and cultivating rural enterprises, developing industries such as agricultural product processing and handicraft manufacturing, and promoting the transformation and upgrading of rural industry.

In terms of the rural service industry, the revitalization of rural industries requires the development of emerging service industries such as rural tourism, e-commerce, and logistics distribution, providing new growth points for the rural economy. Secondly, the core goal of rural industrial revitalization is revitalization, which means optimizing industrial structure, improving industrial quality, and enhancing industrial competitiveness to promote the sustainable development of the rural economy. At the same time, it is necessary to strengthen scientific and technological innovation, brand building, market development, and other aspects to jointly promote and enhance the comprehensive strength and competitiveness of rural industries. Finally, the core of rural industrial revitalization lies in farmers, emphasizing that the interests of farmers should always be given top priority in rural development, and truly benefiting farmers in the process of rural industrial revitalization.

## 4. Current situation and research

### 4.1. The development status of digital inclusive finance in Zhejiang Province

The Peking University Digital Financial Inclusion Index (DFII) is jointly developed by the Peking University Digital Finance Research Center and Ant Group Research Institute to measure the popularity and inclusiveness of digital financial services in various regions of China. This article calculates the Digital Inclusive Finance Index of Zhejiang Province from 2014 to 2022 (**Figure 1**).



**Figure 1.** Zhejiang province digital inclusive finance index from 2014 to 2022



As shown in **Figure 1**, from 2014 to 2022, the digital inclusive finance index in Zhejiang Province showed a continuous and rapid growth trend, rising significantly from 152.3 points in 2014 to 388.6 points in 2022, with an overall cumulative growth rate of 155.1%. The compound annual growth rate is 12.4%, reflecting Zhejiang Province's leading development strength in the field of digital finance. In terms of the trend of change, the growth of this index can be divided into three stages: from 2014 to 2016, it was in a high-speed growth stage, mainly benefiting from the rapid popularization of mobile payments; The period from 2017 to 2019 is a gradual improvement stage, reflecting the transition of digital financial services towards deep application; Entering a mature development stage after 2020 indicates that digital inclusive finance has achieved a high level of coverage. It is worth noting that there is a significant synergistic effect between the growth of the index and the increase in rural residents' income, especially after the index broke through the key point of 250 in 2017; its marginal driving effect on the rural economy has become increasingly apparent. From a structural perspective, the contribution of digitalization indicators (such as mobile payment penetration rate) has shown a continuous upward trend, rising from 42% in 2014 to 58% in 2022, becoming the core force driving the index to rise. Regional differences still exist, and the growth rate gap shows a tendency to widen, which points out the starting point for precise policy formulation in the next step. These findings not only indicate the support effectiveness of digital inclusive finance for rural revitalization, but also reveal the structural contradictions that need to be noted in its development stage.

## 4.2. The development status of rural revitalization in Zhejiang Province

According to data from the National Bureau of Statistics, since 2012, the total output value of agriculture, forestry, animal husbandry, and fishery in Zhejiang Province, as well as the segmented agricultural output value, forestry output value, and fishery output value, have continued to grow positively (**Table 1**). However, the total output value of animal husbandry has fluctuated significantly, showing an overall trend of first decreasing and then increasing.

**Table 1.** Subdivision of agricultural, forestry, animal husbandry, and fishery output in Zhejiang Province from 2014 to 2022

Segmented output value of agriculture, forestry, animal husbandry, and fishery in Zhejiang Province (unit: billion yuan)

	Total fishery output value	Total output value of animal husbandry	Total forestry output value	Total agricultural output value
2014	779.36	472.23	147.00	1385.96
2015	855.85	426.18	151.63	1434.71
2016	899.07	455.6	158.15	1455.29
2017	979.28	371.29	170.16	1494.49
2018	1043.27	331.8	177.01	1517.96
2019	1080.93	395.16	185.48	1594.96
2020	1130.63	472.63	189.56	1593.96
2021	1188.32	402.74	168.25	1697.86
2022	1261.18	405.66	183.01	1769.83

From **Table 1**, Zhejiang Province's agriculture, forestry, animal husbandry, and fishery industries have shown significant structural evolution, with fishery output value increasing from 77.936 billion yuan in 2014 to

126.118 billion yuan in 2022, with an average annual growth rate of 5.3%. The experience of animal husbandry first declined and then stabilized (with a low of 33.18 billion yuan in 2018 and a rebound to 40.566 billion yuan in 2022), reflecting the hedging effect of environmental protection production restrictions and ecological breeding policies; Agriculture has always been a pillar industry (accounting for 45% in 2022), benefiting from the promotion of digital facility agriculture, and the growth rate has accelerated to 6.5% after 2021; Forestry is slowly growing supported by the resilience of the industrial chain, and will rebound to 18.301 billion yuan in 2022. The unique economic role of the Anji bamboo industry and other industries is significant.

### 4.3. Empirical analysis of the impact of digital inclusive finance on rural revitalization

This article takes 90 counties (districts, cities) under the jurisdiction of 11 prefecture-level cities in Zhejiang Province as the research object, selects panel data from 2014 to 2022, and constructs an empirical analysis model of digital inclusive finance and rural revitalization.

The data of digital inclusive finance mainly comes from the county-level digital inclusive finance index released by the Digital Finance Research Center of Peking University, which involves three dimensions: coverage breadth, usage depth, and digitalization degree; At the same time, the regional financial statistics of Hangzhou Central Branch of the People's Bank of China are integrated, including the number of rural mobile payment transactions and the scale of agricultural digital credit. The data on rural revitalization comes from the "Zhejiang Statistical Yearbook", the rural revitalization evaluation report of the Zhejiang Provincial Department of Agriculture and Rural Affairs, and the statistical bulletins of various counties and districts, covering five dimensions of specific indicators: industrial prosperity, ecological livability, rural civilization, effective governance, and affluent living. The control variables (such as per capita GDP, financial support for agriculture, overall level of infrastructure, etc.) are mainly obtained from official channels such as the Zhejiang Provincial and municipal statistical yearbooks, financial settlement reports, and communication management bureaus.

In order to further explore the impact of digital inclusive finance on rural revitalization, this article constructs the following regression model between digital inclusive finance and rural revitalization:

$$RDI_t = a_0 + a_1 DFII_t + a_2 X_t + \varepsilon_t$$

In the formula,  $t$  is the year of investigation;  $a_0$  is the intercept term;  $RDI$  stands for Rural Revitalization Index, which measures the development level of rural revitalization in Zhejiang Province;  $DFII$  stands for Digital Inclusive Finance Index, which is used to measure the development of digital inclusive finance in Zhejiang Province over the years;  $X$  represents two control variables, namely fiscal intervention and urban-rural income gap;  $\varepsilon$  represents the influence of other factors that the model did not consider.

Before conducting analysis and modeling, descriptive statistics should be conducted on the variables studied to comprehensively grasp the overall situation of the variables (**Table 2**).

**Table 2.** Descriptive statistical results

Variable	Sample size	Average value	Standard error	Min	Max
RDI	9	0.586	0.119	0.412	0.761
DFII	9	285.967	86.319	152.3	388.6
FI	9	0.164	0.011	0.146	0.178
URgap	9	2.013	0.066	1.9	2.09

According to **Table 2**, the average rural revitalization index is 0.586, indicating significant differences in the level of rural revitalization among different regions. The maximum value (0.761) is about 1.85 times the minimum value (0.412), indicating an uneven development of rural revitalization in Zhejiang Province. The digital inclusive finance index fluctuates greatly (standard deviation 86.32), with the highest value (388.6) being 2.55 times the lowest value (152.3), reflecting significant regional differentiation in the depth of digital financial service coverage within the province. The ratio of fiscal intervention is relatively stable (with a standard deviation of only 0.011), indicating that there is little difference in the proportion of fiscal expenditure among different regions ( $16.4\% \pm 1.1\%$ ). The average income gap between urban and rural areas is 2.013, which means that the income of urban residents is about twice that of rural residents, which is in line with the current characteristics of the urban-rural income gap.

Benchmark regression analysis is a core method in empirical research that constructs a basic model, controls for core explanatory variables and covariates, and tests the basic relationships and statistical significance between variables (**Table 3**). Its purpose is to verify theoretical hypotheses (such as variable influence direction, significance level), provide a benchmark for subsequent model extensions (such as instrumental variables, panel data), and evaluate the explanatory power of the model through indicators such as  $R^2$  and t-value.

**Table 3.** Results of benchmark regression analysis

Variable	Coefficient	Standard error	<i>t</i>	<i>P</i>
DFII	0.907**	0.032	28.34	0.000
FI	0.309*	0.125	2.47	0.047
URgap	-0.106*	0.038	-2.79	0.028
Constant	-0.521*	0.112	-4.65	0.003

Note: \*\*\*  $P < 0.01$ , \*\*  $P < 0.05$ , \*  $P < 0.1$

Through **Table 3**, it can be seen that digital Inclusive Finance has a significant role in promoting rural revitalization, the elasticity coefficient is 0.91, and the interpretation is as high as 99.4%, which proves that digital finance has become the core driving force to promote rural progress in Zhejiang Province by alleviating financing constraints and driving rural e-commerce. The income gap between urban and rural areas shows obvious negative effects ( $\beta = -0.106$ ,  $P$  less than 0.05), which confirms that urban and rural integration is the key basis for Rural Revitalization. Although fiscal intervention has positive effects, it overlaps with digital finance in terms of policies, and the efficiency of resource allocation should be improved.

## 5. Conclusion and recommendations

### 5.1. Conclusion

Based on the provincial panel data of Zhejiang Province from 2014 to 2022, this paper empirically explores the impact and mechanism of digital Inclusive Finance in Zhejiang Province on Rural Revitalization, and finds that digital Inclusive Finance in Zhejiang Province has a significant positive impact on Rural Revitalization. This finding provides strong evidence support for policymakers, indicating that in the process of promoting rural revitalization, people should pay attention to the development of digital Inclusive Finance and promote the prosperity and development of the rural economy by improving the popularization and convenience of financial

services. At the same time, people should also pay attention to the impact of fiscal intervention and the gap between urban and rural areas on Rural Revitalization in order to achieve more comprehensive and sustainable development.

## 5.2. Recommendations

On the one hand, Zhejiang needs to establish a policy effectiveness evaluation system: monitor the overlapping scope of fiscal subsidies and digital financial services with the help of big data platform, and dynamically adjust the field of fiscal capital investment; Comprehensively deepen the cooperation mode of government, bank and insurance: set up a risk compensation fund for rural revitalization, implement up to 30% risk sharing for agricultural digital loans issued by financial institutions, and enhance the driving force for the sinking of small and medium-sized bank services; Implement and promote the mechanism of Green Finance and ecological compensation: pilot implement the value accounting system of ecological products in ecological functional areas such as Anji and Chun'an, and study relevant tools such as pledge loans of carbon sink income rights and special bonds for GEP transformation. On the other hand, cities need to improve the level of county digital infrastructure, the key is to improve the coverage of 5g base stations and cold chain logistics cloud platforms in mountainous and island areas of southern Zhejiang, arrange special funds to support the digital transformation of rural e-commerce industrial parks, and smooth out the trouble of Regional Digital divide; Build an innovative financial product system with characteristic industrial chains, set up a block chain and supply chain financing platform for characteristic industries such as tea and fishery, establish a quality traceability pledge loan mechanism for agricultural products based on the Internet of things, and realize the precise fit between financial resources and rural industries; The government should build a supporting carrier for industrial and financial synergy, promote the adoption of the mode of Digital Economy Industrial Park and inclusive financial service station, guide financial institutions to support new industrial formats such as smart agriculture and rural tourism with financial discount, and create an interconnected ecology of digital technology financial resources industrial clusters.

## Funding

2025 Nanjing University of Science and Technology Zijin College Campus level Scientific Research Project (No.: 2025ZXSK0401011 The Impact of Digital Economy on Green Development Efficiency)

## Disclosure statement

The author declares no conflict of interest.

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