

Research on the Effect of Rural Industry Revitalization of Digital Inclusive Finance

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Abstract: Digital inclusive finance, as a new type of tool to promote the revitalization of rural industries, provides financial support for the revitalization of rural industries and helps to improve the development of rural industries. Incorporating digital inclusive finance into the development mechanism of rural industry revitalization and promoting digital inclusive finance to promote the development of rural industry more effectively are the key elements to promote the prosperity and revitalization of rural industry at this stage. This paper constructs a spatial econometric model based on the panel dataset of 30 provinces from 2011 to 2021 to analyze the impact of digital inclusive finance on the revitalization of rural industries, and based on the theoretical analysis and empirical results, puts forward the corresponding suggestions to make digital inclusive finance better serve the revitalization of rural industries in China.

Keywords: Digital inclusive finance; Rural industry revitalization; Mechanism test.

1. Background of the Study

In the process of reform and opening up, China has continuously strengthened its own foundation, improved its national strength, and achieved a major victory in the "poverty alleviation and attack" in the process of dripping water through stones. However, in the current development situation, the level of rural development in some areas is still relatively low, and the three rural issues have become the short board of China's overall development, which to a certain extent restricts the balanced and stable development of China's economy and society. 2022 the report of the twentieth CPC National Congress proposes that we should make every effort to aim at the revitalization of the countryside, and unswervingly complete the revitalization of the country's industry, ecology, culture, organization and talents. Among them, industrial revitalization is a prerequisite for solving all rural problems, and its importance is evident. And as finance is the lifeblood of modern economy, financial power should be used to promote rural industrial revitalization. With the concept of digital financial inclusion mentioned for the first time in the G20 Summit, digital financial inclusion is not only "low cost", "low threshold", "large market", "good foundation" and "good foundation", but also "low cost", "low threshold", "large market", "large market" and "good foundation". The advantage of "good foundation" has also emerged.

Digital inclusive finance, as a new type of tool for promoting the revitalization of rural industries, provides financial support for the revitalization of rural industries, helps to improve the level of development of rural industries, and plays an indispensable role in the construction of rural industrial revitalization. Incorporating digital inclusive finance into the development mechanism of rural industrial revitalization and promoting digital inclusive finance to more effectively promote the development of rural industries are the key elements to promote the prosperity and revitalization of rural industries at this stage. How to make digital inclusive finance better serve the revitalization of rural industries in China has become one of the important issues in the development of digital inclusive finance in China.

2. Lit. Combing of Literature

Digital inclusive finance and rural industrial revitalization are both key national concerns and are sought after research topics by scholars at home and abroad. Some scholars believe that finance is an important driving force for the development of social civilization, but financial services in rural areas are more difficult to access, and the development of digital inclusive finance will have a significant impact on rural revitalization through the income-generating effect (Zhang Xun et al., 2019), which in turn promotes the sustainable development of the economy (HONOHANP. 2004). In areas with higher levels of economic development, rural residents benefit more from digital inclusive finance. Empirical research has found that the contribution of digital inclusive finance to the growth of rural revitalization presents a "U"-shaped characteristic (TIAN Lin et al., 2022), that is, the effect of inhibition first, then promotion, and at this stage, the overall level in China has passed the critical point, which is manifested in the effect of promoting rural revitalization. Finally, in terms of reducing the income gap, the impact generated by digital inclusive finance is manifested in the fact that rural areas are larger than urban areas (Shi Lingling et al., 2022), so it has a direct impact on reducing the urban-rural income gap (Tao Yunqing et al., 2021). In addition, compared with traditional finance, its regional divide is smaller, i.e., it can take advantage of the latecomer advantage of urban and rural areas in the central and western regions to reduce the economic gap between urban and rural areas and regions.

3. Research Design

3.1. Construction of the Evaluation Index System for The Level of Rural Industrial Revitalization

Agriculture has a pivotal position in rural industry, this paper combines the requirements of building a strong agricultural country and the conceptual connotation of rural industrial revitalization, and constructs a rural industrial revitalization level evaluation index system, which

specifically includes four level 1 indicators and 18 level 2 indicators of rural modern industrial system, rural industrial infrastructure, rural investment, and green development of industry. The selection and description of relevant indicators are shown in Table 1, and the entropy weight method is adopted for measurement.

Table 1. Evaluation index system of rural industry revitalization level

Level 1 indicators	Level 2 indicators	weights
Rural Modern Industrial System	plantation industry	0.25
Rural industrial infrastructure	network infrastructure	0.12
Investment in the countryside	Tertiary investment	0.28
Greening of industry	Clean energy use	0.35

3.2. Description of Variables

(1) The explanatory variable is the level of rural industry revitalization in each province. By constructing a multi-dimensional evaluation index system and combining the weights calculated by the entropy weighting method, the level of rural industry revitalization of the 30 provinces during the examination period is measured.

(2) The explanatory variable is the level of development of digital inclusive finance, which is measured by the Digital Inclusive Finance Index released by Peking University, which is the most influential and widely used index at present compared with other digital inclusive finance indexes, and more realistically reflects the current situation of digital inclusive finance development.

(3) Mediating variables. The income level of rural residents, the level of industrial innovation and the quality of laborers are selected as the mediating variables in this paper.

(4) Control variables. The control variables selected in this paper include: urbanization rate, per capita gross regional product, total import and export trade as a percentage, Engel's coefficient for rural residents, and agriculture-related loans.

3.3. Subjects of Study and Sources of Data

This paper utilizes panel data of 30 provinces in China (excluding Tibet, Hong Kong, Macao and Taiwan) from 2011-2021 to conduct research on the impact of digital inclusive finance on rural industrial revitalization, and some missing values are treated by linear interpolation. The data of explanatory variables are from the Digital Finance Research Center of Peking University, while the data of explanatory variables and control variables are from China Rural Statistical Yearbook, China Population and Employment Statistical Yearbook, China Statistical Yearbook, China Tertiary Industry Statistical Yearbook, China Health Statistical Yearbook, China Agricultural Statistical Data, China Labor Statistical Yearbook, and statistical yearbooks of each province in previous years.

4. Empirical Analysis

4.1. Model Selection for Spatial Measurement

LM test can be used to test whether there is spatial correlation between regions, and at the same time can determine the type of spatial effect. Table 2 shows the results of the LM test, from which it can be seen that the values of the test statistics are all significantly positive, which indicates

that the samples selected in this paper have a spatial lag effect as well as a spatial error effect. The spatial Durbin model is an extended form of these two models, so this paper considers the selection of the spatial Durbin model for subsequent research.

Table 2. LM test results

Test statistic	LM value	P value
LM_test_sem	7.564	0.006
Robust LM_test_sem	4.471	0.034
LM_test_lag	72.833	0.000
Robust LM_test_lag	69.740	0.000

In order to further verify the rationality of choosing the spatial Durbin model, this paper constructs the spatial lag model, the spatial error model and the spatial Durbin model, respectively, and it can be seen through the Hausmann test that the three models choose the fixed-effects model. The LR test can determine whether the spatial Durbin model will degenerate into the spatial lag or the spatial error model, and this paper can be seen through the LR test of the samples, and the LR chi-square test values are significantly positive, 59.84 and 50.82, respectively. Therefore, the spatial Durbin model will not degenerate into the other two models. In summary, this paper chooses the spatial Durbin time fixed effects model to study the impact of digital financial inclusion on rural industrial revitalization.

4.2. Analysis of Spatial Effects

In the spatial measurement model, the positive regression coefficient of the explanatory variables indicates that they are positively correlated with the explanatory variables, and vice versa, and the larger the absolute value of the coefficient, the stronger the correlation. From the results of the spatial Durbin model in Table 3, the regression coefficient of the development level of digital inclusive finance is significantly positive, which indicates that the development of digital inclusive finance can promote the revitalization of rural industries.

Table 3. Spatial Econometric Regression Results for the Full Sample

	spatial lag model	spatial error model	Spatial Durbin model
DIFI	0.2956***	0.2712***	0.2682***
UR	-0.0125***	-0.0134***	-0.130***
EC	0.0692	0.1178***	0.0711
AL	0.0096***	0.0132***	0.0171***
p	-0.0113	-0.2592	-0.2894
R ²	0.5045	0.4978	0.5934
LR test	59.8400***	50.8200***	

4.3. Robustness Tests

In this paper, we use changing the sample size and adding control variables to conduct robustness tests.

First, the original sample period is 11 years, i.e. 2011-2021. Due to the outbreak of the new crown epidemic in 2020, affected by the epidemic, the various indicators in 2020 compared with previous years have more substantial changes, so this paper chooses to exclude the data in 2020 to conduct robustness tests, and the test results after changing the sample size are shown in Table. The coefficient of the development level of digital financial inclusion is significantly positive and

similar to the test results in Table 3. This indicates that after changing the sample size, digital inclusive finance still has a greater impact on rural industrial revitalization.

Table 4. Robustness test results

	(1)	(2)
DIFI	0.2560***	0.2495***
wDIFI	0.2044***	0.2339**
Control variable	Controlled	Controlled
Log-likelihood	340.0621	374.3474
p	-0.2683	-0.2950
R ²	0.5962	0.5895

Secondly, when constructing the spatial measurement model, the problem of endogeneity caused by omitted variables may occur, so this paper, on the basis of selecting five variables such as per capita GDP and other variables as control variables, adds the degree of population aging as a control variable (measured by the dependency ratio of the elderly population), which is conducive to mitigating endogeneity. The degree of population aging is closely related to the industrial structure, and it is generally believed that an increase in the degree of population aging can promote industrial transformation and upgrading. From the table, it can be seen that the coefficient of the development level of digital

inclusive finance is still significantly positive and similar to the test results in Table 4, which indicates that digital inclusive finance still has a greater impact on rural industrial revitalization after the addition of control variables, again indicating that the empirical results of this paper are robust.

4.4. Mechanism Testing

The results of the mechanism test of digital inclusive finance on the revitalization of rural industries are shown in Table 6. Firstly, this paper selects the income level of rural residents as the mediating variable to carry out the mediation effect analysis, and investigates whether the digital inclusive finance can promote the revitalization of rural industries by improving the income level of rural residents. As can be seen from Table 5, the coefficient of the development level of digital inclusive finance in Column (1) is significantly positive, which indicates that it has a positive effect on the revitalization of the rural industry, based on which, the coefficient of the development level of digital inclusive finance in Column (2) is also significantly positive, which verifies that the digital inclusive finance can significantly contribute to the improvement of the income level. The coefficient of income level in column (3) is significantly positive and the coefficient of digital inclusive finance development level is also significantly positive, which shows that digital inclusive finance can promote rural industrial revitalization by increasing the income level of rural residents.

Table 5. Mediated effects test results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	IR	RRL	IR	IIL	IR	LQ	IR
DIFI	0.0512***	2.5586***	0.0328***	0.1861*	0.0374***	0.6275**	0.0323**
UR	-0.0066***	0.4328***	0.0323**	0.4327**	0.2234**	0.0025**	-0.0033**
PCGDP	0.0015***	0.0024**	0.0021**	0.0032**	0.0054**	0.0002	0.0003
EC	0.0042***	0.0032*	0.0043**	0.0042**	0.0054**	0.0003	0.0049***
AL	0.0045***	0.0036**	0.0052**	0.0032**	0.0034**	0.0024**	0.0016***
IIL					0.0740***		
LQ							0.0282***
R ²	0.2423	0.9116	0.2550	0.4456	0.7405	0.1471	0.7753

Secondly, this paper takes the level of industrial innovation as a mediating variable to analyze the mediating effect. Column (4) of Model II in Table 6 also verifies that digital inclusive finance can promote the improvement of industrial innovation level. The coefficients of the development level of digital inclusive finance and the level of industrial innovation in Column (5) are both significantly positive, indicating that digital inclusive finance can promote the revitalization of rural industry by improving the level of industrial innovation.

Finally, this paper uses the quality of labor as a mediating variable to conduct mediation effect analysis. The coefficient of the development level of digital inclusive finance in column (6) of model 3 in Table 6 is significantly positive, which verifies that digital inclusive finance can significantly promote the improvement of labor quality. In column (7), the coefficient of the quality of workers is significantly positive and the coefficient of the development level of digital inclusive finance is also significantly positive, which shows that digital inclusive finance can promote the revitalization of rural industry through improving the quality of workers.

In summary, the mediation effect test concludes that digital inclusive finance can promote the realization of rural industrial revitalization by increasing the income level of

rural residents, improving the level of industrial innovation and improving the quality of workers.

5. Policy Implications

First, improve the institutional mechanism for digital financial inclusion and activate the endogenous momentum of rural development. Different regions in China have certain differences in the stage of economic development, the scale and efficiency of financial institutions. Therefore, it is necessary to formulate differentiated digital inclusive financial policies according to local conditions and time. For poor areas with poor economic fundamentals, firstly, we should continue to improve the construction of communication networks, financial institutions and other infrastructures in rural areas, and make efforts to publicize and promote digital inclusive finance, so that they can learn to use the new platform to obtain funds and solve the problem of lack of agricultural funds. Secondly, we can appropriately increase local financial transfer payments, and utilize inclusive financial policies to attract local "city returnees" to return home to start their own businesses, and drive the employment of farming households. At the same time,

encourage and support part of the farmers to "go out" will be advanced production methods, management mode "bring back", through a variety of ways to let the poor people "get rich". For areas with better development, while adhering to the original excellent financial policies, we will appropriately tilt digital inclusive finance to innovation and entrepreneurship, guide farmers to optimize the structure of the agricultural industry, and actively innovate, not only to actively develop green and environmentally friendly eco-agriculture, but also to strive to create a new model of income-generating agriculture that combines the consumption of green agricultural products, farm leisure experience, eco-tourism vacations and children's science and popularization of education, so that the internal power of rural revitalization can be activated. Activate the endogenous power of rural revitalization.

Secondly, we are focusing on building rural civilization and enhancing the soft power of rural culture. With the promotion of the rural revitalization policy, rural economic development has been significantly enhanced, but there are still many contradictions in the process of development, such as unbalanced regional development and the inability to keep up with cultural soft power. The realization of rural revitalization should ultimately return to the construction of "people", therefore, on the one hand, local governments should strengthen the spiritual civilization construction in rural areas, not only to fully explore the local outstanding local civilization, increase the rural cultural capital investment, encourage local art creators to actively create excellent works to promote the local culture, but also the need to increase the absorption of foreign culture to cultivate the excellent foreign culture efforts to promote the development of the countryside. It is also necessary to increase the efforts to absorb and cultivate outstanding foreign cultures, so as to ensure that the overall cultural level of the region does not lag behind, and to consolidate the foundation of rural development through cultural revitalization. On the other hand, different regions should carry out the construction of rural civilization in a reasonable and orderly manner. For Jiangsu, Zhejiang, Shanghai and other developed coastal cities in the east, on the basis of inheritance, we should pay more attention to the innovation and integration of rural culture, do a good job in the overall layout of the construction of the soft power of rural culture, and serve as a good cultural revitalization of the vane; for the relatively backward western regions such as Gansu, Sichuan, Guizhou and so on, we need to do a good job in the focus, the key cultural areas of the local layout of the cultural revitalization. For Gansu, Sichuan, Guizhou and other relatively backward western regions, we should do a good job of cultural revitalization in the focus, key cultural areas of the local layout, the inheritance of good culture as the first priority, and actively learn from the east of the countryside cultural soft indicators.

Thirdly, improving public governance capacity and establishing a long-term mechanism for rural revitalization. Improving planning and management and enhancing public governance capacity is an important part of rural revitalization. On the one hand, governments at all levels should comprehensively consider the efficiency of land use, the level of industrial development, the cultivation of cultural atmosphere, the protection of the living environment, and the planning of rural housing, etc., and design an "all-around, multi-level, focused, and far-reaching" rural governance program; at the same time, it is necessary to strengthen the

construction of the credit system, implement the monitoring of the dynamics of poverty eradication, and set up a database for the tracking and return to poverty. At the same time, it is necessary to strengthen the construction of the credit system, implement dynamic monitoring of poverty eradication, and establish a database for tracking funds and returning to poverty, so as to combine the "dynamic" and "long-term" aspects of poverty eradication work. On the other hand, the digital inclusive financial system, including micro-payment, micro-credit, micro-insurance, micro-investment and other aspects, should be brought into full play in the face of major emergencies such as the new coronavirus outbreak and other major emergencies, and play the role of financial protection for disadvantaged groups such as farmers and small and micro-enterprises by establishing special accounts for emergencies, so as to unlock the funds at the slightest sign of an emergency, and to transfer the risk of death and bankruptcy from small families and small enterprises to large organizations, so as to achieve risk diversification and to make use of the digital inclusive financial system. This will transfer the risk of death and bankruptcy from small families and small businesses to large institutions, thus achieving risk diversification and improving emergency response and public governance capacity with the help of the "speed", "universality" and "benefit" of digital inclusive finance, and serving rural revitalization.

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