Original Paper

The Effect of Digital Finance on Rural Revitalization

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Abstract

Digital finance is gradually becoming an important source of strength to promote rural revitalization. In order to give full play to the role of digital finance in promoting rural revitalization, based on the provincial panel data of China from 2011 to 2021, this paper constructs rural revitalization indicators and explores the effect of digital finance on rural revitalization. It is found that the development of digital finance has a significant effect on rural revitalization; Digital finance has a positive impact on rural revitalization by improving the level of urban-rural integration, promoting agricultural modernization and boosting economic growth; In high-income areas, digital finance plays a more significant role in promoting rural revitalization; The higher the level of digital finance, the better it can play a role in promoting rural revitalization.

Keywords

digital finance, rural revitalization, urban-rural integration, agricultural modernization, economic growth

1. Introduction

In 2022, the report of the 20th National Congress emphasized the need to comprehensively promote rural revitalization and accelerate the construction of a powerful agricultural country. In 2023, the No. 1 Document of the Central Committee pointed out that it is necessary to accelerate the modernization of agriculture and rural areas and adhere to the integration of urban and rural development. A strong country starts with strong agriculture, and a strong country is only strong when agriculture is strong. However, the effective implementation of a rural revitalization strategy cannot be separated from finance, and the income increase of rural residents, the improvement of infrastructure in rural areas, the improvement of the ecological environment in rural areas and the promotion of agricultural and rural modernization cannot be separated from financial support. The Strategic Plan for Rural Revitalization (2018-2022) issued in 2018 pointed out that financial support for agriculture should be strengthened at this stage. Facing the rapid development of digital technology, the No. 1 Document of the Central

Committee in 2021 pointed out that it is necessary to vigorously develop rural digital inclusive finance, so that the development of digital finance can promote the implementation of rural revitalization strategy. So, can the development of digital finance effectively promote rural revitalization? What is its inherent transmission mechanism? Is there any heterogeneity in its influence? This paper examines this issue.

2. Theoretical Evidence of Digital Finance Promoting Rural Revitalization

Digital finance is a deep combination of the traditional financial industry and digital information technology. The emergence of new formats and models of digital finance has greatly alleviated the problems of high borrowing costs, low efficiency and difficult risk control in a traditional financial industry when serving rural areas (Yudong Sun et al., 2023).

Ge H et al. (2022) found that the development of digital inclusive finance significantly promoted the integration of rural industries, and the positive impact was more significant in areas with higher levels of integration. Junyong Cao et al. (2023) studied 31 provinces in China by using the system GMM and threshold effect model and also found that the development of digital inclusive finance significantly promoted the development of rural industrial integration, especially in economically developed areas. Pang Jinbo et al. (2023) found that the transmission path of digital inclusive finance to promote rural industrial integration is to promote the progress of agricultural technology, and the use of depth and coverage breadth play a more obvious role in promoting the central and western regions.

Chen B et al. (2021) found that digital finance can inhibit the occurrence of poverty based on CHFS data, and its mechanism paths are relaxing credit and information constraints, expanding social networks, and stimulating entrepreneurship. Lingling Shi et al. (2022) found that digital inclusive finance can increase residents' income through industrial upgrading and economic development, and its influence on poor groups is more obvious. Lian X et al. (2022) found that digital inclusive finance promotes rural residents' income increase in terms of entrepreneurship, investment, non-agricultural employment, and mechanized production by studying rural residents' income in grain-producing areas in China.

Min Wang et al. (2023) found that digital inclusive finance significantly promoted rural revitalization, and at the same time, it played a more significant role in promoting areas with high consumption levels and high human capital. It is also found that digital inclusive finance can promote rural revitalization by increasing the mechanization penetration rate, stimulating entrepreneurship and increasing income. Weifu Meng et al. (2023) found that digital inclusive finance can relax credit constraints and promote rural revitalization with significant spatial spillover effects.

This paper selects the data of 30 regions in China from 2011 to 2021 (excluding Tibet, Hong Kong, Macao and Taiwan), calculates the rural revitalization level index, and uses Peking University Digital Inclusive Finance Index to deeply analyze the impact of digital financial development on rural revitalization from the perspective of urban-rural integration, agricultural modernization and economic

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growth.

3. Model Design and Variable Introduction

3.1 Data Sources and Variable Descriptions

The research sample of this paper is the provincial digital finance and rural revitalization panel data of 30 provinces (excluding Tibet) in mainland China from 2011 to 2021. The measurement data of digital finance comes from the Digital Finance Research Center of Peking University, and other data come from China Statistical Yearbook, China Labor Statistics Yearbook, China Urban Statistics Yearbook, National Bureau of Statistics, etc.

a. Core explanatory variable: The level of digital finance development (Index). This paper draws on Xun Zhang et al. (2019) and uses the logarithmic value of the Peking University Digital Inclusive Finance Index (Feng Guo et al., 2020) as an indicator of the level of digital finance development.

b. Explained variable: The level of rural revitalization (Rur). Based on the principle of comprehensiveness and availability, this paper draws lessons from the practices of Ting Zhang et al. (2018), Ye Tian et al. (2022) and Min Wang et al. (2023), and constructs the rural revitalization index evaluation system from five aspects: prosperous industry, ecological livability, civilized rural customs, effective governance and affluent life.

In order to ensure that the rural revitalization index of each province is comparable across years, this paper draws lessons from the practice of Jun Liu et al. (2020), takes 2011 as the base period, and uses the following formula to standardize the positive original data:

$$B_{it} = \frac{A_{it} - A_{min0}}{A_{max0} - A_{min0}} \tag{1}$$

For negative raw data, the standardization formula is as follows:

$$B_{it} = \frac{A_{max0} - A_{it}}{A_{max0} - A_{min0}} \tag{2}$$

In equations (1) and (2), A_{max0} and A_{min0} represent the maximum and minimum values of the original data in the base period year, respectively, and t represents the year. The rural revitalization index constructed after the above standardization treatment can intuitively reflect the development trend of rural revitalization in different provinces with time. After that, the entropy value method is used to assign weights to obtain the rural revitalization level of each province each year and take the logarithm of it. Table 1 shows the evaluation system of the rural revitalization index constructed in this paper and the weights obtained by entropy method.

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Table 1. Rural Revitalization Index Evaluation System

First-class index	Secondary index	Weight	Attribute
Prosperous industry	Added value of agriculture, forestry, animal husbandry and fishery	0.0698	+
	Per capita grain output	0.0748	+
	Ratio of effective irrigated area to total sown area	0.0602	+
Ecological livability	Forest coverage rate	0.0477	+
	Rural electricity consumption	0.1062	+
	Number of village clinics	0.0691	+
	Number of doctors and health workers per 10,000 people in villages	0.0339	+
	Participation rate of pension insurance	0.0342	+
Civilized rural customs	Coverage rate of rural TV programs	0.0085	+
	Financial expenditure on recreation and culture	0.0613	+
	Telephone penetration rate	0.0369	+
	Per capita possession of public library collections	0.0587	+
	Completed investment in industrial pollution control	0.0880	+
Effective governance	Number of autonomous organization units per 10,000 people	0.0457	+
	Number of village committee units per 10,000 people	0.0557	+
Affluent life	Ratio of consumption of rural residents to urban residents	0.0310	+
	Ratio of income of rural residents to urban residents	0.0276	+
	Engel coefficient	0.0159	-
	The proportion of rural residents' wage income to total income	0.0323	+
	The proportion of rural residents' expenditure on education, culture and entertainment to total expenditure	0.0426	+

c. Intermediary variables: The level of urban-rural integration (Urb), the level of agricultural modernization (Agr), and the level of regional economy (Eco). Urbanization rate is an important index to measure the level of regional development and directly determine the symbiosis of urban-rural integration (Xiaolong Wu, 2023), so this paper uses the logarithmic value of urbanization rate to measure the level of urban-rural integration. With the development of agricultural modernization, crop production relies more and more on mechanization, and agricultural mechanization is the most direct embodiment of agricultural modernization (Yugang Ding et al., 2022). Therefore, this paper uses the logarithmic value of total power of agricultural machinery to measure the level of agricultural modernization. At the same time, this paper uses the logarithmic value of regional per capita GDP to measure the regional economic level (Qifan Xu et al., 2022).

d. Control variables: Education penetration (Edu), foreign trade (Fot), population status (Pop), basic transportation level (Tra), Internet development level (Int), and gender ratio (Gen). Among them, education penetration is measured by the proportion of the illiterate population to the population over 15 years old; Foreign trade is measured by the logarithm of total investment in foreign-invested enterprises; Population status is measured by total dependency ratio; Basic traffic level is measured by the ratio of highway mileage to the regional area; Internet development level is measured by the logarithm of rural broadband access users; Gender ratio is measured by the ratio of the male population to female population. The following table shows descriptive statistics of each variable.

Table 2. Descriptive Statistics of Variables

Variable	Mean	Std. dev.	Min	Max
The level of rural revitalization (Rur)	-0.903	0.294	-1.849	-0.268
The level of digital finance development (Index)	5.283	0.669	2.909	6.129
The level of urban-rural integration (Urb)	4.068	0.198	3.557	4.495
The level of agricultural modernization (Agr)	7.685	1.121	4.543	9.499
The level of regional economy (Eco)	10.831	0.451	9.682	12.142
Education penetration (Edu)	4.771	2.737	0.790	16.630
Foreign trade (Fot)	11.386	1.437	7.948	15.326
Population status (Pop)	0.381	0.074	0.193	0.578
Basic transportation level (Tra)	0.956	0.509	0.089	2.234
Internet development level (Int)	4.972	1.462	-0.693	7.353
gender ratio (Gen)	1.050	0.042	0.958	1.232

3.2 Model Design

In order to test the impact of digital financial development on rural revitalization, the following model is constructed in this paper:

$$Rur_{it}=\alpha_1 Index_{it}+\alpha_z C_{it}+\alpha_0+\mu_i+\sigma_t+\varepsilon_{it} \tag{3}$$

In the above formula, Rur_{it} is the rural revitalization level of i province in t year, and $Index_{it}$ is the digital financial level of i province in t year. C_{it} is the control variable of i province in t year, μ_i is the fixed effect of province, σ_t is the fixed effect of year, ε_{it} is the random disturbance term, and α_1 is the influence coefficient of digital finance on rural revitalization.

In order to have a deeper understanding of the effect mechanism of digital finance development on rural revitalization level, this paper takes the urban-rural integration level, agricultural modernization level and regional economic level as intermediary variables, and constructs the following intermediary effect model:

$$Rur_{it}=\alpha_1 Index_{it}+\alpha_z C_{it}+\alpha_0+\mu_i+\sigma_t+\varepsilon_{it} \tag{4}$$

$$Med_{it}=\beta_1 Index_{it}+\beta_z C_{it}+\beta_0+\mu_i+\sigma_t+\varepsilon_{it} \tag{5}$$

$$Rur_{it}=\gamma_1 Index_{it}+\gamma_2 Med_{it}+\gamma_z C_{it}+\gamma_0+\mu_i+\sigma_t+\varepsilon_{it} \tag{6}$$

In the above equation, Med_{it} represents the intermediary variable of t years in i province, and the rest of the variables are consistent with the above. On the premise that α_1 is significant, if β_1 and γ_2 are significant, it can be said that there is obvious mediating effect. At the same time, if γ_1 is also significant, it is a partial mediating effect, and if γ_1 is not significant, it is a complete mediating effect.

4. Empirical Analysis

4.1 Benchmark Regression Result Analysis

Through the Hausman test, this paper chooses the fixed effect model for benchmark regression. Table 3 shows the benchmark regression results of the impact of digital finance development on rural revitalization. Columns (1), (2), and (3) in the table are the result of adding time-fixed effects and control variables in turn. It can be seen from the results that the development of digital finance has significantly promoted rural revitalization, and its significance has always remained at 1%, regardless of whether time-fixed effects and control variables are added.

Further analysis of the regression results of control variables shows that foreign trade has a significant positive impact on rural revitalization, which may be due to the abundant funds and advanced management concepts brought by foreign investment, which promoted the income increase of rural residents, optimized the ecological environment and further promoted rural revitalization (Zhen Zhong et al., 2019). The basic transportation level also significantly promotes rural revitalization. The reason may be that the improvement of transportation networks strengthen the communication between urban and rural areas, and rural residents can increase the opportunities of going out for employment and entrepreneurship, and can also sell special products to other regions, thus increasing income and promoting rural revitalization. However, the population situation significantly inhibits rural

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revitalization. The reason may be that the greater the proportion of children and the elderly in the labor force, the more likely it is to bring an economic burden to rural families, lead to poverty, and then inhibit rural revitalization.

Table 3. Benchmark Regression Results

	(1) Rur	(2) Rur	(3) Rur
Index	0.190***	0.175***	0.156***
	(0.011)	(0.061)	(0.049)
Edu			-0.005
			(0.006)
Pop			-0.982***
			(0.234)
Fot			0.039**
			(0.014)
Tra			0.185***
			(0.045)
Int			-0.006
			(0.015)
Gen			-0.217
			(0.139)
_cons	-1.905***	-1.818***	-1.695***
	(0.058)	(0.224)	(0.346)
year	No	Yes	Yes
province	Yes	Yes	Yes
R2	0.786	0.821	0.868

Note. ***, **, and * represent significant at 1%, 5%, and 10% levels, respectively. The brackets are robust standard errors clustered to provinces, the same as below.

4.2 Robustness Tests

4.2.1 Replace the Explained Variable

In order to test whether the benchmark regression results are stable or not, this paper uses the weighting method of Jun Liu et al. (2020) to empower the above rural revitalization index evaluation system and obtains a new rural revitalization level index (Rur2) to replace the explained variables in the benchmark regression above. Table 4, column (1) shows the results after the replacement of the explained variable, from which it can be seen that digital financial development still significantly promotes rural revitalization, which is significant at the 1% level and consistent with the results of the benchmark regression.

4.2.2 Tailoring Treatment

From the descriptive statistics of variables in Table 2 above, it can be seen that there are great differences in rural revitalization level and digital finance development level among different regions. In this study, both of them are treated with a tail reduction to avoid outliers interfering with regression results. Because the development level of digital finance has a left tail phenomenon, the development level of digital finance is reduced by 10% on the left side, and the rural revitalization level is reduced by 5% on both sides, and then regression analysis is carried out. Column (2) of Table 4 shows the regression results after the tailoring treatment, and the results show that digital financial development still significantly promotes rural revitalization and is significant at the 1% level, which passes the robustness test.

4.2.3 Instrumental Variable Method

Because there are some problems such as missing variables and bidirectional causality, this paper uses an instrumental variable method to alleviate endogeneity. This paper draws lessons from the methods of Qunhui Huang et al. (2019) and Tao Zhao et al. (2020), and adopts the historical data of posts and telecommunications in 1984 as the tool variable of the digital financial development level index. First of all, the usage habits and technologies of traditional communication tools in local history will have a certain impact on the current digital technology. Secondly, the frequency of traditional communication tools such as fixed telephones is declining, which has little impact on rural revitalization at present. Because the selected instrumental variable is cross-sectional data, this paper draws lessons from the practice of Nunn N and Qian N (2014), and takes the interaction item between the number of telephones per 10,000 people in each province in 1984 and the number of mobile Internet users in the previous year as the instrumental variable.

The regression results in column (3) of Table 4, after considering endogeneity, show that the positive impact of the development of digital finance on rural revitalization remains significant at the 1% level. In addition, the significance level of P value of Kleibergen-Paap rk LM is 1%, which significantly rejects the hypothesis of "insufficient identification of instrumental variable"; The Wald F value of Kleibergen-Paap rk is larger than the 10% level critical value in Stock-Yogo test, which indicates that the instrumental variable has passed the weak identification test and shows the rationality of the

instrumental variable.

Table 4. Robustness Tests

	(1)	(2)	(3)
	Replace the explained variable	Tailoring treatment	Instrumental variable method
	Rur2	Rur	Rur
Index	0.203^{***}	0.243^{***}	0.374^{***}
	(0.063)	(0.083)	(0.115)
Control	Yes	Yes	Yes
year	Yes	Yes	Yes
province	Yes	Yes	Yes
R^2	0.887	0.834	0.967
Kleibergen-Paap rk LM			22.761[0.000]
Kleibergen-Paap rk Wald F			20.399{16.38}

Note. [] is the P value and {} is the critical value at the 10% level of the Stock-Yogo test.

4.3 Intermediary Effect Analysis

4.3.1 The Level of Urban-Rural Integration

Table 5 shows the results of the intermediary effect tests. It can be seen from column (1) that the development of digital finance has a direct impact on rural revitalization. From column (2), it can be concluded that digital finance significantly promotes rural-urban integration, which is significant at the 1% level. It can be seen from column (3) that the development of digital finance and the improvement of urban-rural integration have a significant positive impact on rural revitalization. It confirms the existence of a partial mediating effect that the development of digital finance can promote rural revitalization by promoting urban-rural integration. In addition, after Bootstrap sampling test for 1000 times, the confidence interval after adjusting deviation does not contain 0, which further confirms the existence of an intermediary effect.

4.3.2 The Level of Agricultural Modernization

Column (4) shows that the development of digital finance can significantly contribute to the level of agricultural modernization. It can be seen from column (5) that the development of digital finance and agricultural modernization has significantly promoted rural revitalization, both at the level of 1%. It proves that there is a partial mediating effect of digital finance to promote rural revitalization by enhancing the level of agricultural modernization. Meanwhile, Bootstrap test shows that the confidence interval after adjusting deviation does not contain 0, which further confirms the existence of an intermediary effect.

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4.3.3 The Level of Regional Economy

From column (6), it can be concluded that the development of the digital economy has a significant positive impact on the regional economy. It can be seen from column (7) that the development of digital finance and regional economy significantly promotes rural revitalization at the same time. At the same time, after Bootstrap test, the confidence interval after deviation adjustment does not contain 0. It can be seen that the development of digital finance can promote rural revitalization by stimulating economy, and part of the mediating effect holds.

Table 5. The Results of the Intermediary Effect Tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Rur	Urb	Rur	Agr	Rur	Eco	Rur
Index	0.156^{***}	0.139^{***}	0.094^{**}	0.269^{**}	0.135^{***}	0.126^{**}	0.128^{***}
	(0.049)	(0.036)	(0.045)	(0.128)	(0.049)	(0.058)	(0.046)
Urb			0.444^{**}				
			(0.184)				
Agr					0.078^{***}		
					(0.028)		
Eco							0.220^{*}
							(0.113)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
province	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.868	0.919	0.873	0.166	0.873	0.966	0.873
Confidence interval（BC）	0.0246889~0.1117324			0.0057678~0.048927		0.0066209~0.0636636	

4.4 Heterogeneity Analysis

In order to further explore the internal relationship between digital finance and rural revitalization, this paper explores the boundary conditions of digital finance promoting rural revitalization by means of group regression, and analyzes the heterogeneity of digital finance promoting rural revitalization.

a. Heterogeneity analysis based on different income levels of rural residents. Improving the income level of rural residents is an important part of the implementation of rural revitalization strategy, and it is also an important foundation and driving force for rural revitalization. The income level of rural residents affects the promotion of rural revitalization to a certain extent. In this paper, the per capita disposable income of rural residents is used as the basis for grouping, and (1), (2) and (3) of Table 6 are listed as regression results. The results show that the promotion of digital finance development to rural

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revitalization is more significant in low-income and high-income samples, but not significant in middle-income samples. Among them, the promotion effect of digital financial development on rural revitalization is the most significant and has the highest coefficient in the high-income sample. It shows that in high-income areas, digital finance plays a greater role in promoting rural revitalization, which reflects the importance of increasing the income of rural residents.

b. Heterogeneity analysis based on different development stages of digital finance. In this paper, the digital financial development index is taken as the grouping basis, and (4), (5) and (6) of Table 6 are listed as regression results. The results show that the development of digital finance has a more significant positive impact on rural revitalization in the initial and mature stages, but has no significant promotion effect in the growth stage. Among them, in the mature stage of digital finance development, its promotion to rural revitalization is the most significant and the coefficient is the largest. This indicates that digital finance will become an important factor to promote rural revitalization when it enters the mature stage, and provide strong support for the implementation of rural revitalization strategy.

Table 6. Heterogeneity Test Results

	Different income levels			Different development stages of digital finance		
	(1)	(2)	(3)	(4)	(5)	(6)
	Low	Middle	High	Initial stage	Growth stage	Mature stage
	Rur	Rur	Rur	Rur	Rur	Rur
Index	0.132**	0.145	1.906***	0.096**	0.026	2.411***
	(0.059)	(0.253)	(0.610)	(0.038)	(0.256)	(0.736)
Control	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes
province	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.905	0.640	0.495	0.912	0.566	0.354

5. Conclusions and Suggestions

Based on the provincial panel data of 30 provinces in mainland China (except Tibet) from 2011 to 2021, this paper constructs an index evaluation system of rural revitalization level, and studies the effect and mechanism of digital finance development on rural revitalization by using Peking University Digital Inclusive Financing Index. The research draws the following conclusions: First, the development of digital finance can significantly promote rural revitalization. Second, the development of digital finance promotes rural revitalization by promoting urban-rural integration, agricultural modernization and economic growth. Third, the promotion of digital finance development to rural revitalization is more significant in rural high-income areas; Digital finance can better promote rural revitalization after entering the mature stage.

Based on the above conclusions, the following suggestions are put forward:

First of all, we should actively promote the construction of digital finance and promote the development of digital finance in the countryside. Firstly, we should improve the rural digital financial infrastructure system, accelerate the construction of digital countryside, provide a good digital environment for the countryside, and make full use of Internet information technology to improve the digital level in rural areas. Secondly, financial institutions should strengthen the publicity of digital financial services in rural areas and improve the financial literacy of residents in rural areas. At the same time, they should combine local characteristics and launch digital financial services suitable for local development to meet the diversified financial needs of local residents, broaden their sources of funds, motivate rural residents to engage in employment and entrepreneurship, and promote the effective implementation of the rural revitalization strategy. It is imperative to promote the development of digital finance, and the sooner digital finance development enters the fast lane, the better it can promote rural revitalization.

Second, we should adhere to the integration of urban and rural development and promote the interconnection of urban and rural basic networks. First of all, we should encourage the exchange of talents between urban and rural areas, encourage digital and financial talents to enter and build villages, and narrow the urban-rural digital divide. Relevant departments should provide certain assistance for talents going into the city and going to the countryside, provide financial and policy support for relevant talents, and lay a solid foundation for talent exchange between urban and rural areas. Secondly, we should use digital technology to connect the industrial development between urban and rural areas, help the digital development of rural industries, provide digital production, storage, circulation and sales services for traditional rural industries, promote the revitalization of rural industries by relying on digital technology, improve the income level of rural residents, and maximize the promotion efficiency of digital financial development on rural revitalization.

Third, we should vigorously promote the modernization of agriculture and rural areas and upgrade the economic level of rural areas. We should actively promote the digitalization, intelligence and modernization of rural areas, enrich the lives of rural residents and accelerate the modernization of rural areas. Secondly, we should promote the development of agricultural mechanization and wisdom to save time in agricultural production, so that rural residents can have more time for non-agricultural production and entrepreneurship, broaden the income channels of rural residents, increase the income of rural residents, and promote the economic growth of rural areas, so that the development of digital finance can better promote rural revitalization.

References

Cao, J. Y., & Zhang, L. Z. (2023). The dynamic impact of digital inclusive finance on the development of rural industrial integration—A test based on systematic GMM and threshold effects. *Southwest Finance*, (01), 43-55.

Chen, B., & Zhao, C. (2021). Poverty reduction in rural China: Does the digital finance matter? *Plos one*, *16*(12), e0261214. https://doi.org/10.1371/journal.pone.0261214

Ding, Y. G., & Sun, Q. X. (2022). The impact of climate risk on China's agricultural economic development—Heterogeneity and mechanism analysis. *Financial Studies*, (09), 111-131.

Ge, H., Li, B., Tang, D., Xu, H., & Boamah, V. (2022). Research on digital inclusive finance promoting the integration of rural three-industry. *International Journal of Environmental Research and Public Health*, *19*(6), 3363. https://doi.org/10.3390/ijerph19063363

Guo, F., Wang, J. Y., Wang, F., Kong, T., Zhang, X., & Cheng, Z. Y. (2020). Measuring the development of digital inclusive finance in China: Indexing and spatial characteristics. *Economics (Quarterly)*, (04), 1401-1418.

Huang, Q. H., Yu, Y. Z., & Zhang, S. L. (2019). Internet development and manufacturing productivity improvement: Intrinsic mechanisms and China's experience. *China Industrial Economics*, (08), 5-23.

Lian, X., Mu, Y., & Zhang, W. (2023). Digital inclusive financial services and rural income: Evidence from China's major grain-producing regions. *Finance Research Letters*, *53*, 103622. https://doi.org/10.1016/j.frl.2022.103622

Liu, J., Yang, Y. Y., & Zhang, S. F. (2020). A study on the measurement and drivers of China's digital economy. *Shanghai Economic Research*, (06), 81-96.

Meng, W. F., Li, S., Liu, J. H., & Chen, Y. (2023). A study on the impact mechanism of digital inclusive finance for rural revitalization. *Economic Issues*, (03), 102-111.

Nunn, N., & Qian, N. (2014). US food aid and civil conflict. *American Economic Review*, *104*(6), 1630-1666. https://doi.org/10.1257/aer.104.6.1630

Pang, J. B., & Wu, N. L. (2023). Research on the effect and mechanism of digital inclusive finance on the integrated development of rural industries. *Journal of Hubei University for Nationalities (Philosophy and Social Science Edition)*, (02), 94-103.

Shi, L. L., Yu, X. J., Yang, W., & Liang, W. S. (2022). Income-increasing effect and mechanism of action of digital inclusive finance—An empirical analysis based on municipal panel data in China. *Research in Financial Economics*, (02), 93-104.

Sun, Y. D., & Wang, X. H. (2023). Practical value, practical challenges and policy responses of digital inclusive finance for rural revitalization. *Journal of Beijing Administrative College*, (01), 112-120.

Tian, Y., Ye, Y. T., Huang, J., & Liu, Q. (2022). The intrinsic mechanism and empirical test of rural industrial revitalization driven by digital economy—Based on the mediating effect of urban-rural integration and development. *Issues in Agricultural Economics*, (10), 84-96.

Wang, M., Gu, Y., & Li, Z. W. (2023). Digital inclusive finance and rural revitalization: A theoretical logic and empirical test. *Journal of Northwestern University (Philosophy and Social Science Edition)*, (01), 56-71. https://doi.org/10.1016/j.frl.2023.104157

Wu, X. L. (2023). Regional measurement and empirical evidence of urban-rural coexistence development in China. *Statistics and Decision Making*, (02), 41-46.

Xu, Q. F., Zou, G. N., & Gan, X. Q. (2022). Fiscal investment, 5G industry and economic growth. *Reform*, (08), 123-140.

Zhang, T., Li, M. R., & Xu, Y. M. (2018). Construction and empirical study of rural revitalization evaluation index system. *Management World*, (08), 99-105.

Zhang, X., Wan, G. H., Zhang, J. J., & He, Z. Y. (2019). Digital Economy, Inclusive Finance and Inclusive Growth. *Economic Research*, (08), 71-86.

Zhao, T., Zhang, Z., & Liang, S. K. (2020). Digital economy, entrepreneurial activity and high quality development—Empirical evidence from Chinese cities. *Management World*, (10), 65-76.

Zhong, Z., Yu, Z. T., & Bai, D. (2019). Leisure agriculture and rural tourism in the context of rural revitalization: Does foreign investment matter? *China Rural Economy*, (06), 76-93.