

Original Research Article

## Digital inclusive finance and the construction of livable and beautiful rural areas—an empirical study based on panel data from 2011 to 2020

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**Abstract:** The development of livable, prosperous, and harmonious rural communities represents a strategic decision in China's comprehensive implementation of the rural revitalization strategy for the new era. This initiative holds significant theoretical and practical implications for studying rural development approaches. Digital inclusive finance has broken through traditional financial constraints, creating new opportunities for advancing rural revitalization and promoting high-quality agricultural development, thereby injecting fresh momentum into China's rural progress. Based on panel data from 30 provinces (2011-2020), this study constructs an indicator system for rural development metrics, employs two-way fixed effects and System GMM estimation methods, and examines the impact of digital inclusive finance on rural construction. Findings demonstrate that digital inclusive finance positively contributes to the development of livable, prosperous, and harmonious rural communities. The research provides practical references for policymakers to dynamically monitor digital financial development and enhance rural digital efficiency, ultimately advancing rural revitalization efforts.

**Keywords:** digital inclusive finance; livable and prosperous rural communities; agriculture and rural development; fixed effects

### 1. Introduction

The report of the 20th National Congress of the Communist Party of China proposes to build livable and beautiful villages and win the battle against poverty. In the new journey of comprehensively building a modern socialist country, the rural revitalization strategy and the construction of livable and beautiful villages are promoted. This is the latest theoretical achievement developed by combining historical experience, practical logic and construction rules.

A literature review reveals that most academic studies on digital inclusive finance focus on its impact on rural revitalization strategies, primarily addressing three key aspects (Zhao Jian et al., 2023). First, the mechanisms and pathways through which inclusive finance promotes rural revitalization. Scholars predominantly employ normative analysis, examining its effects through economic principles, as demonstrated in the works of Xie Lin (2020) and Yi Weiwei (2021). Second, the welfare effects of inclusive finance in supporting rural revitalization. This area combines normative and empirical approaches, with scholars like Liu Yuli and Ma Zhengbing (2019) highlighting its positive role in rural development. Third, research on the relationship between digital inclusive finance and rural revitalization. Some scholars conduct empirical tests, such as the study by Li Jigang and Ma Jun (2021).

In the development of livable, prosperous, and beautiful rural communities, current research primarily focuses on theoretical analyses of their essence, significance, and implementation strategies (Zhao Deqi et al., 2023). Firstly, the core concept is clarified: such villages meet farmers' needs while balancing multifaceted development, where 'harmony' reflects 'soft power' and 'beauty' emphasizes modern landscapes. Secondly, the significance is highlighted: rural modernization, as a key focus, serves as both a prerequisite for building a strong agricultural nation and a crucial component of comprehensive socialist modernization. Thirdly, theoretical approaches are proposed, emphasizing the dual importance of 'shaping' and 'soul-casting'. "Shaping" involves breaking down urban-rural barriers, promoting industrial revitalization, and improving living environments, while 'soul-casting' focuses on refining governance systems, innovating cultural platforms, and fostering

ecological civilization.

The paper makes the following contributions: First, the measurement of livable and workable construction level is of great reference value to understand the construction process; Second, the panel data of 30 provinces are selected to study the impact of the development of digital inclusive finance on the construction.

## 2. Theoretical analysis and research hypothesis

As the latest form of financial development, the digital inclusive finance system adopts core traditional financial functions to enhance system efficiency through multiplier effects and synergistic integration. While financial support is crucial for building livable, prosperous, and harmonious rural communities, the inherent conflict between financial "profit-seeking" and rural "vulnerability" has left many villages in a state of "financial exclusion," hindering rural revitalization. A balanced approach combining fairness with efficiency, integrating government leadership with market-driven mechanisms, represents a viable solution for inclusive finance. However, traditional inclusive finance struggles with high costs, risk management challenges, and uneven development due to information asymmetry and unique characteristics of rural financial demand. Digital inclusive finance addresses these shortcomings as an emerging financial tool. Leveraging modern digital technologies, it establishes an "industry-academia-research-promotion" smart agriculture development model that improves information asymmetry, reduces financing costs, enhances the mobility and efficiency of production factors, facilitates agricultural scale effects, expands financial service coverage, increases credit support rates for rural enterprises, meets farmers' diverse funding needs, and boosts household incomes. Therefore, this paper argues that digital inclusive finance directly impacts the construction of livable, prosperous, and harmonious rural communities in two key ways: First, it reduces operational and transaction costs for operators through digital technology, resolving information asymmetry issues; second, it improves farmers' financing access by lowering barriers and broadening credit and deposit channels. Based on these findings, the paper proposes that the development of digital inclusive finance can elevate the quality of rural community construction.

## 3. Research design

### 3.1. Model construction

To examine the impact of digital inclusive finance on livable, business-friendly, and harmonious rural development, this study constructs panel data using relevant variables and  $Rural_{it} = \alpha_0 + \alpha_1 \cdot PD_{it} + \alpha_2 \cdot Control_{it} + \alpha_i + \theta_t + \varepsilon_{it}$  investigates  $Control_{it}$ ,  $PD_{it}$ ,  $Rural_{it}$ ,  $\alpha_0$ ,  $\alpha_1$ ,  $\alpha_2$ ,  $i$ ,  $t$ ,  $\varepsilon_{it}$  their relationship through a two-sided fixed effects model. While static panel data regression may be susceptible to autocorrelation and heteroscedasticity issues, we enhance model robustness and reduce endogeneity by introducing a lagged one-period variable for livable, business-friendly, and harmonious rural development. A dynamic panel data model is then established, with the impact validated using the Systematic Generalized Method of Moments (SYS-GMM) approach.

$Rural_{it} = \delta_0 + \delta_1 \cdot PD_{it} + \delta_2 \cdot Rural_{it-1} + \delta_3 \cdot Control_{it} + \alpha_i + \theta_t + \varepsilon_{it}$  Regarding variable selection: The dependent variables are livability (*Rural*) and business-friendliness, as well as the level of rural revitalization, comprising *PD* three primary indicators and 18 secondary indicators, with a comprehensive index calculated using the entropy method. The core explanatory *Fzhan Czhen Srfp* variable is the Digital Inclusive Finance Index, modeled after Peking University's Digital Inclusive Finance Index. Control variables account for the impact of economic development level, urbanization rate, and urban-rural income distribution ratio on rural revitalization.

In the empirical analysis *VIF*, we first examined the multicollinearity of *VIF* explanatory variables, with results showing no multicollinearity among the variables. Using the Hausman test, we selected an individual and time fixed effects model to investigate the impact, and introduced the SYS-GMM model for comparative analysis. The benchmark regression results.

The results demonstrate that the regression coefficients of digital financial inclusion remain statistically significant at the 1% level without control variables. When control variables are included, the model's goodness of fit improves, and its explanatory power becomes more robust. The SYS-GMM model analysis reveals that digital financial inclusion significantly enhances livable and prosperous rural development, with a time-lag effect, confirming Hypothesis 1.

	fixed effect		SYS-GMM	
lnRural			0.607*** (5.36)	0.782*** (13.28)
lnPD	0.322*** (7.76)	0.141*** (3.08)	0.087*** (2.82)	0.033** (2.06)
lnFZ		3.808*** (4.04)		0.881* (1.68)
lnCZ		0.614*** (3.75)		-0.096* (-1.88)
lnSR		0.186 (0.44)		-0.170 (-0.52)
cons	-2.728*** (-18.10)	-13.656*** (-6.88)	-0.976*** (-3.15)	-1.929* (-2.01)
N	300	300	270	270
AR(1)			0.008	0.002
AR(2)			0.449	0.458
Hansen test			0.538	0.675
R-squared	0.755	0.801		

Research Findings: By analyzing panel data from 30 provinces between 2011 and 2020 and incorporating the Digital Inclusion Index, this study employs two-way fixed effects and System GMM estimation methods for empirical analysis. The results demonstrate that digital inclusive finance significantly enhances livability, business-friendly environments, and the development of beautiful rural communities, with the findings being statistically significant.

## References

- [1] Zhao J, Wei X. Coupling and coordination analysis of digital inclusive finance and rural revitalization: A case study of six central provinces [J]. *Statistics and Decision-making*, 2023,39(15):142-146. DOI: 10.13546/j.cnki.tjyjc.2023.15.026.
- [2] Xie Lin. Functional Analysis of Rural Inclusive Finance on Rural Economy under the Rural Revitalization Strategy [J]. *Hubei Social Sciences*, 2020, (08):84-89. DOI: 10.13660/j.cnki.42-1112/c.015441.
- [3] Yi Weiwei. Innovative Approaches of Inclusive Finance in Rural Revitalization [J]. *People's Tribune*, 2021, (25):96-98.
- [4] Liu Yuli, Ma Zhengbing. Inclusive Financial Support and Its Welfare Effects on Farmers' Transformation in Rural Revitalization [J]. *Journal of Northwest Minzu University (Philosophy and Social Sciences Edition)*, 2019, (06):163-175. DOI: 10.14084/j.cnki.cn62-1185/c.2019.06.016.
- [5] Li Jigang, Ma Jun. Empirical study on the relationship between digital inclusive finance development and rural revitalization[J]. *Statistics and Decision-making*, 2021,37(10):138-141. DOI: 10.13546/j.cnki.tjyjc.2021.10.030.
- [6] Zhao Deqi, Wang Shizhe. Measurement, regional disparities and dynamic evolution of livable, workable and harmonious rural construction in China [J/OL]. *Journal of Jiangxi University of Finance and Economics*, 1-16 [2023-12-19] <https://doi.org/10.13676/j.cnki.cn36-1224/f.20231212.001>.