

Original Research Article

The impact of digital inclusive finance on the urban-rural income gap in the Yangtze River Economic Belt

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Abstract: Based on panel data from 107 prefecture-level cities in the Yangtze River Economic Belt spanning from 2011 to 2023, this paper employs the Peking University Digital Inclusive Finance Index to examine the effect of digital inclusive finance on the urban-rural income gap in the Yangtze River Economic Belt. The study finds that the development of digital inclusive finance can effectively curb the urban-rural income gap. The government should fully leverage the role of digital inclusive finance in narrowing the urban-rural income gap by providing low-income groups with higher-quality financial services and income-increasing channels.

Keywords: common prosperity; digital inclusive finance; urban-rural income gap

1. Introduction

As one of China's regions with immense development potential and leading comprehensive strength, the Yangtze River Economic Belt faces a series of structural challenges amid its sustained overall economic growth^[1]. Significant disparities persist between urban and rural areas in terms of income distribution, resource allocation, and development opportunities, and the urban-rural dual structure remains fundamentally unresolved. The emergence of digital inclusive finance offers important insights for narrowing the urban-rural income gap. Against this backdrop, this paper selects the Yangtze River Economic Belt as the research object to analyze the impact of digital inclusive finance on the urban-rural income gap. This analysis will help various regions within the belt formulate differentiated development strategies based on their specific conditions regarding digital inclusive finance development levels and the urban-rural income gap, thereby stimulating urban and rural economic vitality.

2. Theoretical analysis

Under the traditional financial system, constrained by the limited coverage of physical branches and persistently high service costs, financial resources tend to concentrate in more efficient developed regions and urban sectors, resulting in a scarcity of financial resources in rural areas^[2]. Rural residents face difficulties in accessing relevant financial knowledge and services, and the problem of financial exclusion has long persisted^[3]. Relying on its advantages in digital technology, digital inclusive finance effectively reduces information asymmetry and transaction costs, significantly enhancing the credit accessibility of rural residents. This not only alleviates the capital constraints faced by rural productive activities and optimizes the efficiency of factor allocation, but also strengthens the accumulation of financial knowledge among farmers, thereby injecting endogenous impetus into rural economic prosperity and narrowing the urban-rural income gap.

3. Research design

3.1. Variable selection

3.1.1. Dependent variable

This paper selects the Theil index to measure the urban-rural income gap. The specific calculation formula is as follows:

$$\text{theil}_{i,t} = \sum_{j=1}^2 \left[\frac{I_{ij,t}}{I_{i,t}} \right] \ln \left[\frac{I_{ij,t}/I_{i,t}}{Z_{ij,t}/Z_{i,t}} \right]$$

Where i represents the region code and t represents the year. Z_i denotes the total population, and I_i denotes the total income.

3.1.2. Explanatory variable

This paper takes the development level of digital inclusive finance as the core explanatory variable and measures it using the Peking University Digital Inclusive Finance Index. This paper selects this index and applies a logarithmic transformation.

3.1.3. Control variables

To eliminate the interference of other factors on the model as much as possible and to enhance the accuracy and scientific rigor of the model, this paper further selects a series of control variables. These include the level of agricultural mechanization(AGM), infrastructure construction(INF), the level of economic development(ECO), the urbanization rate(UR), and the upgrading of industrial structure(IS). The level of agricultural mechanization is measured by the ratio of total agricultural machinery power to the sown area of crops. Infrastructure construction is measured by the ratio of highway mileage to the regional area. The level of economic development is measured by the logarithmic transformation of gross domestic product. The urbanization rate is measured by the ratio of the urban population to the total population. The upgrading of industrial structure is measured by the ratio of the value added of the tertiary industry to that of the secondary industry.

3.2. Data sources

The data in this paper are primarily sourced from the China City Statistical Yearbook, the statistical yearbooks of provinces and municipalities in the Yangtze River Economic Belt, and the Peking University Digital Inclusive Finance Index.

3.3. Model specification

This paper constructs the following model:

$$\text{theil}_{i,t} = \beta_0 + \beta_1 \text{dfi}_{i,t} + \beta_2 X_{i,t} + u_i + v_t + \varepsilon_{i,t}$$

Where theil represents the Theil index, dfi denotes the digital inclusive finance index, $X_{i,t}$ represents the control variables, u_i denotes the individual effects, v_t denotes the time effects, and $\varepsilon_{i,t}$ represents the random error term.

4. Empirical results analysis

4.1. Baseline regression

This paper employs a two-way fixed effects panel model for baseline regression. **Table 1**, Column (1) examines the impact of digital inclusive finance on the urban-rural income gap in isolation, while Column (2) introduces a series of control variables to enhance the explanatory power of the model. The regression analysis indicates that, regardless of whether control variables are included, the regression coefficient for digital inclusive finance is significantly negative. Leveraging its advantages in digital technology, digital inclusive finance can, on the one hand, reduce information asymmetry and transaction costs, enhance the credit accessibility of rural residents, and alleviate production capital constraints. On the other hand, it expands the sales channels for agricultural products and increases the income-generating opportunities for rural residents, thereby effectively narrowing the urban-rural income gap.

Table 1. Baseline regression results.

Variable	(1)	(2)
	THEIL	THEIL
DFI	-0.0646***	-0.0376***
	(-8.6695)	(-5.1381)
AGM		-0.0004***
		(-3.3484)
INF		-0.0079***
		(-3.2449)
ECO		-0.0089**
		(-2.3033)
UR		-0.0018***
		(-11.9930)
IS		-0.0119***
		(-6.2386)
_cons	0.4080***	0.4635***
	(10.4730)	(10.2120)
N	1391	1391
R ²	0.9034	0.9176
Individual fixed	Yes	Yes
Time fixed	Yes	Yes

Note: *, **, and *** are used to indicate significance at the 10%, 5%, and 1% levels, respectively. The same applies below.

4.2. Heterogeneity analysis

Given that the Yangtze River Economic Belt spans China's eastern, central, and western regions, covering a vast area with significant differences in economic development levels, industrial structure, and resource endowments across its upper, middle, and lower reaches^[4], the impact of digital inclusive finance on the urban-rural income gap may vary across these regions. This paper further divides the Yangtze River Economic Belt into three major regions—The upper, middle, and lower reaches—And conducts separate regressions to explore the regional heterogeneity of the impact of digital inclusive finance on the urban-rural income gap. The regression results are presented in **Table 2**.

The results in **Table 2** indicate that the impact of digital inclusive finance on the urban-rural income gap exhibits significant regional heterogeneity. Specifically, the coefficient of DFI in the upper reaches is significantly negative, demonstrating the strongest narrowing effect. The coefficient of DFI in the lower reaches is also significantly negative, indicating a significant inhibitory effect. In contrast, the coefficient in the middle reaches is negative but not significant, suggesting that the narrowing effect is not evident. This may be attributed to the fact that the middle reaches are in a transitional phase of economic development and industrial structure, where the role of digital inclusive finance has yet to be fully realized.

Table 2. Regional heterogeneity results.

Variable	(1)	(2)	(3)
	Upper Reaches	Middle Reaches	Lower Reaches
DFI	-0.0371***	-0.0189	-0.0167**
	(-2.6974)	(-0.8385)	(-2.4657)
AGM	0.0009	-0.0009***	0.0002
	(1.1705)	(-4.4930)	(1.0427)
INF	-0.0012	0.0102	-0.0226***
	(-0.2669)	(1.4698)	(-9.2046)
ECO	-0.0072	-0.0356***	0.0139***
	(-1.3185)	(-3.1343)	(3.1872)

Continuation Table 2.

Variable	(1)	(2)	(3)
	Upper Reaches	Middle Reaches	Lower Reaches
UR	-0.0009*** (-3.3624)	-0.0012** (-2.2055)	-0.0021*** (-17.1375)
IS	-0.0000 (-0.0119)	-0.0180*** (-5.0894)	-0.0062*** (-2.6532)
_cons	0.3808*** (4.5753)	0.5126*** (3.8894)	0.2013*** (4.5467)
N	390	468	533
R ²	0.9328	0.8596	0.9512
Individual fixed	Yes	Yes	Yes
Time fixed	Yes	Yes	Yes

5. Conclusions and recommendations

5.1. Conclusions

From the perspective of the Yangtze River Economic Belt as a whole, the development of digital inclusive finance exhibits a significant negative correlation with the urban-rural income gap. From the perspective of heterogeneity analysis, significant regional heterogeneity exists in the impact of digital inclusive finance on the urban-rural income gap. Specifically, the narrowing effect is strongest in the upper reaches, followed by the lower reaches, while the effect in the middle reaches is not yet significant.

5.2. Recommendations

The government should increase investment in the construction of digital infrastructure to effectively enhance the coverage of digital inclusive finance. At the same time, it is necessary to establish and improve a sound policy and regulatory framework. A well-developed policy and regulatory system serves as the foundation for effective supervision, and relevant authorities should strengthen institutional development to create a clearer and more stable policy environment for digital inclusive finance.

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