

Research on the Impact of Digital Inclusive Finance on Urban and Rural Income--Take Anhui Province as an Example

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ABSTRACT

The coordinated and healthy development of urban and rural income is an important process to achieve high-quality economic development. Taking the income of urban and rural residents in Anhui Province as the research object, this paper analyzes the impact of digital inclusive finance on urban and rural income in Anhui Province through an empirical study of the relevant data of 16 prefecture-level cities in Anhui Province from 2011 to 2020. Based on the research results, this paper puts forward countermeasures and suggestions for improving the construction of rural digital infrastructure, increasing the publicity of digital inclusive finance, and improving relevant laws and regulations, so as to provide a theoretical basis and promotion reference for digital inclusive finance to promote rural revitalization in Anhui Province.

KEYWORDS

Digital financial inclusion; Urban and rural income; Anhui Province

1. INTRODUCTION

Before the reform and opening up, the economic growth of China's urban and rural areas showed an unbalanced state. After the reform and opening up, China's economic development has accelerated, but there is still a large gap between urban and rural incomes, which has not fundamentally changed the dual economic structure of urban and rural areas, hindered the coordinated development of urban and rural areas, and affected the high-quality development of the domestic economy. As an underdeveloped province and a large agricultural province, Anhui Province has a relatively large proportion of rural area and population, and at the same time, the GDP and per capita income levels in urban areas are mostly higher than those in rural areas, and there is a certain gap between urban and rural areas in terms of educational resources, medical conditions, employment opportunities, etc., resulting in a very significant income gap between urban and rural areas, causing an imbalance in the income of urban and rural residents. Therefore, this paper makes an empirical analysis of the improvement of urban and rural income in Anhui Province through digital inclusive finance, which is conducive to narrowing the gap between urban and rural areas in Anhui Province and promoting comprehensive common prosperity and coordinated development.

In the era of digital economy, digital inclusive finance not only gives full play to its inclusiveness, but also gives full play to its advantages in breadth, depth of use, and degree of digitalization in rural areas and underdeveloped areas, which not only reduces transaction costs, but also improves the

universality of financial services. Therefore, with the continuous development of digital inclusive finance, the problem of lack of financial services in rural areas can be effectively improved, providing sustainable formal financial services for more groups lacking financial services, improving the vitality of financial market entities, effectively reducing urban and rural incomes, promoting high-quality rural economic development, and promoting rural revitalization and common prosperity.

This paper will conduct an empirical study on 16 prefecture-level cities in Anhui Province by establishing a panel data model, and provide some effective suggestions for the coordinated development of urban and rural areas in Anhui Province based on the research results.

2. LITERATURE REVIEW

At present, the research on digital inclusive finance covers the urban-rural gap, economy, employment, import and export trade, etc., while scholars' research on the urban-rural gap mainly focuses on the urban-rural consumption gap and the urban-rural income gap. Based on the research on the impact of digital inclusive finance on urban and rural income, most scholars believe that digital inclusive finance can narrow the income gap between urban and rural areas and improve the gap between the rich and the poor. Liu Songtao (2024) measures the income gap between urban and rural areas by constructing the Theil index, and believes that digital inclusive finance can help narrow the income gap between urban and rural areas from a macro perspective. Dong Yufeng (2020) believes that digital inclusive finance strengthens the availability of financial services in remote and poor areas such as rural areas, resolves the contradiction of financial poverty alleviation, and gives full play to its advantages in poverty alleviation and poverty alleviation. Guo Ruixin (2024) empirically analyzed the impact of digital inclusive finance on urban and rural income using a two-way fixed-effect model, and the results also showed that the level of digital inclusive finance was positively correlated with farmers' income, which could effectively reduce urban and rural income. Wang Yongchang (2021) pointed out that digital inclusive finance will help China's financial supply-side reform, promote economic structural transformation, increase farmers' income, and narrow the income gap between urban and rural areas. Liu Zeqiang (2022) believes that digital inclusive finance can increase the relative and absolute income of farmers, thereby achieving the overall improvement of farmers' income and promoting rural revitalization. Some scholars have also proposed that the impact of the development of digital inclusive finance on the urban-rural income gap presents a "U" shaped pattern, that is, the initial stage leads to the narrowing of the gap, but the subsequent progress is associated with the widening of the gap.

To sum up, due to its own accessibility and inclusiveness and the development of Internet big data technology, digital inclusive finance can enable remote and poor areas such as rural areas to obtain more complete financial services and products, thereby narrowing the income gap between urban and rural areas and promoting economic development. However, most of the literature is mainly from the national level, and few scholars explore the impact on urban and rural income from a specific province, so this project will explore the impact of digital inclusive finance on urban and rural income in Anhui Province from the perspective of Anhui Province.

3. THEORETICAL ANALYSIS

3.1. The Concept and Application of Digital Financial Inclusion

Digital inclusive finance is a new financial model that realizes the inclusiveness, fairness and progress of financial services, and its basic concept is to make financial services benefit more user groups, narrow the gap between the rich and the poor, improve the quality of financial services, and help develop a more dynamic financial market through financial technology means. The concept was first proposed at the G20 summit in 2016 to make up for the shortcomings of traditional inclusive finance

with high costs and high degree of risk control. At the same time, based on digital means and the combination of Internet big data, digital inclusive finance can help reduce the income imbalance between urban and rural areas and effectively contribute to the development of agricultural economy by reducing service costs and improving accessibility, empowering agriculture to be high-quality and efficient, improving agricultural quality, improving the level of agricultural modernization, and promoting the construction of a rural digital inclusive financial system.

3.2. Analysis of the Current Situation and Causes of the Income Gap Between urban and Rural Areas

In terms of income distribution, in 2023, the median per capita disposable income of urban residents will be 47,122 yuan, an increase of 4.4%, and the median will be 90.9% of the average. The median per capita disposable income of rural residents was 18,748 yuan, up by 5.7 percent, and the median was 86.4 percent of the average. On the whole, the income level of urban areas is higher than that of rural areas, and the income level of urban and rural areas is unbalanced. For the imbalance between urban and rural income levels, there may be the following reasons: differences in economic development models, differences in urban and rural survival and livelihood methods; The difference in the burden of tax expenses, farmers have the problem of other taxes and fees and less shares, and the burden is heavier; There are differences in the education level of the population, with more intellectual workers in urban areas, while rural migrant workers are more engaged in manual labor and have fewer opportunities.

3.3. Mechanism Analysis of the Impact of Digital Inclusive Finance on urban and Rural Income

First, the development of digital financial inclusion has the potential to create more jobs and have a positive impact on the income levels of poor farmers. Liu Wei (2021) pointed out that digital inclusive finance improves farmers' financial literacy and digital skills, increases farmers' access to financial resources, and strengthens farmers' human capital accumulation, thereby narrowing the income gap between urban and rural areas. Second, the development of digital financial inclusion has lowered the threshold effect, reaching more low-income people to meet their personal needs. Chen Hailong (2021) believes that in terms of traditional financial loan services, digital inclusive finance touches the end of income distribution and better meets their individual needs. Third, the development of digital inclusive finance plays a significant role in narrowing the income gap between urban and rural areas, while promoting the high-quality development of the national economy. Zhang Changbing (2021) found that digital inclusive finance has a significant convergence effect on the urban-rural income gap, which is conducive to better realizing the rural revitalization strategy and promoting the high-level development of rural modernization.

4. VARIABLE SELECTION AND DESCRIPTION

4.1. Variable Selection

4.1.1. Explanatory variables

In this paper, the urban-rural income gap (GAP) is taken as the explanatory variable, and it is expressed as the per capita disposable income of urban residents/per capita disposable income of rural residents, which can directly measure the index of urban-rural income gap, which basically reflects the change trend of urban-rural income gap. The larger the GAP, the greater the income gap between urban and rural areas.

4.1.2. Explanatory variables

Taking the Digital Inclusive Finance Index (DIFI) as the explanatory variable, this paper selects the digital financial inclusion index of 16 prefecture-level cities in Anhui Province in the Peking University Digital Inclusion Index (Phase III, 2011-2020) released by the Center for Digital Finance Research of Peking University, so as to evaluate the development of digital inclusive finance in Anhui Province. The higher the DIFI value, the higher the level of inclusive development and the stronger the financial inclusion.

4.1.3. Control variables

The control variables involved in this paper include education level (EDU), government fiscal expenditure (GOV), and degree of financialization (FIN). Specifically, the proportion of municipal government expenditure in regional GDP in Anhui Province is selected to evaluate the financial support of each city, the proportion of the balance of deposits and loans of financial institutions in Anhui Province to the regional GDP is used to measure the degree of financialization of each city, and the proportion of the number of students in ordinary colleges and universities in each city of Anhui Province to the total population of the region is selected to measure the education level of each city.

4.2. Data Sources

The sample data sources include the Statistical Yearbook of Prefecture-level Cities in Anhui Province (2011-2020), the Digital Financial Inclusion Index Report of Peking University (2011-2020), and the Statistical Bulletin on the National Economic and Social Development of Prefecture-level Cities in Anhui Province (2011-2020). Based on the above data collation samples, 160 sample data were finally obtained in this paper, and the statistical software used was Stata 16.0.

4.3. Descriptive Analysis of Variables

This paper mainly studies the impact of digital financial inclusion on urban and rural income in Anhui Province, and mainly selects five variables, including the explanatory variable urban-rural income gap (GAP), the explanatory variable Digital Financial Inclusion Index (DIFI), the control variable education level (EDU), government fiscal expenditure (GOV), and financialization degree (FIN). Descriptive statistical analysis of the raw data was performed as shown in Table 1.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GAP	160	2.360	0.238	1.782	2.914
DIFI	160	176.468	68.776	27.080	299.159
EDU	160	0.018	0.015	0.002	0.065
GOV	160	0.209	0.058	0.116	0.356
FIN	160	2.421	0.537	1.538	4.071

5. EMPIRICAL ANALYSIS

5.1. Model Building

Due to the large difference in the data of each variable, the influence of extreme values and heteroskedasticity is reduced, and the model is more stable, this paper will perform logarithmic processing on the variable data and propose the following research model.

$$\ln GAP_{it} = \beta_0 + \beta_1 \ln DIFI_{it} + \beta_2 \ln EDU_{it} + \beta_3 \ln GOV_{it} + \beta_4 \ln FIN_{it} + \delta_i + \theta_t + \varepsilon_{it}$$

The model takes the logarithm of the original variable in order to make the variables in the model more stable. $\beta_1, \beta_2, \beta_3, \beta_4$ is the regression coefficient of the explanatory variable of the model, and $\ln GAP$ is the explanatory variable, which is used to quantify the urban-rural income gap. $\ln DIFI$ is an explanatory variable used to quantify the development level of digital financial inclusion. In addition, three control variables are introduced into the model, among which $\ln GOV$ represents the fiscal expenditure of municipal governments in Anhui Province; $\ln EDU$ indicates the level of education development of each city in Anhui Province; $\ln FIN$ indicates the degree of financialization of cities in Anhui Province; δ_i is the regional fixed effect, θ_t is the timing fixed effect, and ε is the random perturbation term of the model.

5.2. Correlation Analysis

All variables were logarithmically analyzed using STATA software, and the results are shown in Table 2.

Table 2. Pairwise correlations

Variable	$\ln GAP$	$\ln DIFI$	$\ln EDU$	$\ln GOV$	$\ln FIN$
$\ln GAP$	1.000				
$\ln DIFI$	-0.424* (0.000)	1.000			
$\ln EDU$	-0.336* (0.000)	0.205* (0.009)	1.000		
$\ln GOV$	0.250* (0.001)	-0.129 (0.104)	-0.689* (0.000)	1.000	
$\ln FIN$	-0.031 (0.699)	0.548* (0.000)	0.210* (0.008)	0.189* (0.017)	1.000
Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$					

Correlation analysis is used to measure the degree of correlation between variable factors, and the closer the correlation coefficient is to ± 1 , the stronger the correlation between variables. As can be seen from Table 2, the explanatory variable $\ln DIFI$ is negatively correlated with $\ln GAP$, that is, the income gap between rural and urban areas decreases with the increase of urban development. Among the control variables, except for government expenditure, the other control variables are negatively correlated with the urban-rural income gap. In order to further verify the relationship, the regression results and analysis will be carried out in this paper.

5.3. Regression Results and Analysis

In this paper, the digital financial inclusion index and three sub-indicators are used as the explanatory and control variables of the model, and the regression analysis results are shown in Table 3 through the F-test and the Hausmann test, so the fixed-effect model is selected for regression analysis to understand the impact of the development of digital inclusive finance on urban and rural income in Anhui Province.

Table 3. Regression results

	(1)	(2)
	lnGAP	lnGAP
lnEDU	-0.179***	-0.145***
	(-4.312)	(-3.473)
lnGOV	-0.121	-0.181**
	(-1.436)	(-2.164)
lnFIN	0.196**	0.253***
	(2.027)	(2.650)
lnDIFI		-0.336***
		(-3.103)
_cons	-0.203	-0.025
	(-0.702)	(-0.086)
Time effect	Control	Control
Regional effect	Control	Control
N	160	160
R2	0.362	0.406

Notes: ***p<0.01, **p<0.05, *p<0.10.

In this paper, it can be seen from the table that before the explanatory variables are added, the regression coefficient of lnEDU is significantly negative at the 1% level, and the regression coefficient of lnFIN is significantly positive at the 10% level. Then GOV regression coefficient was negative, and after adding the explanatory variables, the lnEDU regression coefficient was significantly negative at the 1% level, and the lnFIN regression coefficient was significantly positive at the 1% level. Then GOV regression coefficient is significantly negative at the 5% level, which shows that digital inclusive finance can effectively narrow the gap between urban and rural areas in Anhui Province. At the same time, it can be seen from the data that there is a negative correlation between the urban-rural income gap (lnGAP) and the Digital Inclusive Finance Index (lnDIFI) in Anhui Province, with an estimated coefficient of -0.336, indicating that the income gap between urban and rural residents in Anhui Province will gradually narrow in the process of digital inclusive development. Moreover, through the analysis, it can be seen that the P values of the digital inclusive finance index, government fiscal expenditure, financialization degree, and education level are 0.0020, 0.032, 0.009, and 0.001, respectively, which are less than 0.05, which is obviously significant, and in addition, the education level estimation coefficient is -0.145, indicating that the improvement of education level can effectively improve the income of urban and rural areas in Anhui Province and narrow the income gap between urban and rural areas in Anhui Province. The estimated coefficient of government expenditure is -0.181, indicating that fiscal expenditure can narrow the income gap between urban and rural areas in Anhui Province. The financialization coefficient is 0.253, is a positive value, indicating that the increase in the degree of financialization will exacerbate the income gap between urban and rural areas, which is also because the higher the degree of financialization of a city, the more conducive to the improvement of the city's resource utilization efficiency, so that more social resources flow to urban areas, widening the income gap between urban and rural areas.

6. RESULTS AND SUGGESTIONS

6.1. Conclusions

Based on the relevant data of 16 prefecture-level cities in Anhui Province from 2011 to 2020, this paper empirically shows that the development of digital inclusive finance can effectively narrow the urban-rural income gap in Anhui Province, and the fiscal expenditure, education level and

financialization degree of each city in Anhui Province have a significant effect on urban and rural income.

6.2. Suggestions

6.2.1. Improve the construction of rural digital infrastructure

Due to the low degree of rural development environment and network construction, there is a certain gap compared with the city, therefore, governments at all levels in Anhui Province should increase financial expenditure and policy assistance to rural areas, improve the construction of Internet infrastructure in rural areas, and improve the network penetration and use rate in rural areas.

6.2.2. Increase the publicity of digital inclusive finance

Due to the lack of corresponding understanding of digital inclusive finance among rural residents, funds in rural areas only flow into cities through simple storage, which is difficult to profit from the current development of digital inclusive finance, and it is difficult to play the role of digital inclusive finance in narrowing the income gap between urban and rural areas. At the same time, relevant commercial banks should also increase their outlets in rural areas, provide deposits and wealth management products to meet the needs of rural people, provide corresponding digital financial services, better implement the development and penetration of digital inclusive finance, promote the narrowing of the income gap between urban and rural areas in Anhui Province, and promote rural revitalization and common prosperity.

6.2.3. Improve relevant laws and regulations

Relevant governments should establish and improve the system of relevant laws and regulations, provide good protection mechanisms for the development of digital inclusive finance, do a good job in relevant financial supervision work, lead the healthy and orderly progress of digital inclusive finance, and actively publicize fraud prevention to the people, especially those in rural areas, to guide people to protect their rights and interests in accordance with laws and regulations, promote the development of digital inclusive finance, and also promote regional economic growth.

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