The Impact of Digital Inclusive Finance on Relative Poverty of Residents

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Abstract. Based on the Beijing University Digital Inclusive Finance Index and the 2014-2018 China Household Finance Survey data, this paper empirically verifies the specific impact of digital inclusive finance on alleviating relative poverty among Chinese residents using a panel fixed effects model. The research results indicate that the level of development and coverage breadth of digital inclusive finance have a significantly positive impact on alleviating relative poverty among residents. This is because digital inclusive finance increases residents' employment opportunities, raises employment income, and prompts the expansion of social capital. The study also finds regional and age group differences in the alleviation effect of digital inclusive finance on relative poverty among residents, with the alleviation effect in the western region higher than that in the eastern region and higher among non-elderly groups compared to elderly groups. Therefore, empowering finance with digital technology is an effective way to address relative poverty among residents.

Keywords: digital inclusive finance, relative poverty, panel fixed effects model, heterogeneity

1. Introduction

Fighting against poverty has always been a major concern in governance both in ancient and modern times [1]. By the end of 2020, China achieved a comprehensive victory in the battle against poverty, completing the arduous task of eliminating absolute poverty. Relative poverty groups have become the main body of the impoverished population. Scholars have drawn significant characteristics of relative poverty in China at three levels based on Oxford University's "double-threshold method": at the urban-rural level, poverty issues brought about by employment are more severe in eastern, central, and western cities, while the contribution of poverty in rural areas in these three regions varies due to factors other than employment, among which the western rural areas face more severe environmental problems. Generally, there is a significant regional disparity in relative poverty, with multidimensional poverty incidence in rural areas far higher than in urban areas; at the level of population distribution, it mainly manifests in age groups, with a relative poverty rate of over 24% for those over 60 years old, compared to just over 10% for other age groups. At the regional distribution level, it can be concluded that poverty incidence is higher in mountainous and ethnic minority areas [2]. Therefore, we cannot slacken our efforts. Although absolute poverty has been eradicated, the journey of poverty alleviation is still long. It requires us to forge ahead and seek long-term mechanisms for poverty reduction.

As the shortcomings of the existing financial system become increasingly apparent: many potential customers such as small and medium-sized enterprises, micro-enterprises, individual operators, farmers, or individual clients are neglected, forcing them to obtain the financial services they need through informal financial channels. This not only adds to their individual burden but may also lead to social risks such as "returning to poverty" [3]. Reform of the financial system is urgently needed. In recent years, with the development of Internet technology, digital financial services such as digital inclusive finance have emerged. Digital inclusive finance, which is integrated with the digital economy, refers to a form of inclusive finance driven by digital technology. It aims to promote the development of inclusive finance by using digital technology, enabling all groups with financial service needs, especially residents in remote areas and low-income residents, to enjoy effective financial services. This further enriches the connotation and extension of finance [4]. In particular, the development of digital finance is conducive to improving both relative and absolute income levels of households [5]. Therefore, against the backdrop of transitioning from completely eradicating absolute poverty to alleviating relative poverty, it remains to be seen whether digital inclusive finance can mitigate the issue of relative poverty among households.

Based on the considerations mentioned above, this paper will explore the impact of digital inclusive finance on household relative poverty from the perspectives of regional disparities and age heterogeneity. The aim is to seek strategies for poverty reduction from both internal and external factors, innovate the path of poverty reduction and wealth creation through digital inclusive finance, thereby consolidating the achievements of poverty alleviation and advancing towards the goal of shared prosperity.

2. Literature Review

The theory of rights poverty posits that the lack of basic rights such as financial services is an important cause of poverty [6]. Recently, scholars have paid more attention to the impact of inclusive finance on household relative poverty. Li Zhaonan and other scholars were the first to focus on Ningxia and used entropy method, Logit model, and intermediary effect model to analyze the impact of digital inclusive finance on multidimensional relative poverty of rural households. They found that relative poverty caused by factors such as health, education, safe drinking water, and sanitary toilets in the region remains severe, and the degree of participation of rural households in digital inclusive finance is low. However, digital inclusive finance has a significant mitigating effect on relative poverty under different weights. This can be achieved by increasing rural households' willingness and behavior in e-commerce, enhancing health awareness, and promoting consumption to alleviate relative poverty [7]. Moreover, as the deprivation dimension increases, its poverty reduction effect shows an increasing trend. Building on this, Liu Wei examined the impact and mechanism of digital inclusive finance on urban and rural residents' relative poverty from the perspective of income inequality. They found that for every 1% increase in the digital inclusive finance index, the probability of residents experiencing relative poverty decreases by 3.2%. It effectively alleviates individuals' relative deprivation, as digital inclusive finance development improves family risk management capabilities, alleviates financing constraints, and promotes the expansion of family social capital. The study also found that there are differences in the alleviation effect of digital inclusive finance on poverty between urban and rural populations [8]. Additionally, Chen Ping, based on the perspective of aging, found that digital inclusive finance can alleviate relative poverty among the elderly population across multiple dimensions such as income, health, social security, and living environment, but the digital divide weakens this mitigating effect [9]. Sun Jiguo found that digital inclusive finance can mitigate rural relative poverty by promoting rural entrepreneurship and improving farmers' risk preferences. Internet usage is one of the underlying reasons for the differential effects of digital inclusive finance on rural relative poverty alleviation [10]. Yang Yiwu focused on the Yangtze River Delta region and found that digital inclusive finance significantly reduces the probability of urban households experiencing relative poverty mainly through digital payment and digital lending channels [11]. Yang Xinyao and other scholars used discrete choice models and combined macro-micro models to study the spatial convergence, spatial correlation, and intrinsic mechanisms of digital inclusive finance in promoting multidimensional relative poverty reduction. They found significant spatial convergence and correlation in the multidimensional relative poverty incidence among provincial-level administrative regions in China. Digital inclusive finance not only helps poverty reduction at the micro-family level but also contributes to reducing the incidence of multidimensional relative poverty at the macro-regional level. Mechanism analysis results show that the multidimensional poverty reduction effect of digital inclusive finance mainly manifests in improving family income, employment, consumption structure, subjective perception, and information acquisition status [12]. Zhang Tongjin, Duan Zhimin, and other scholars found that the higher the level of household financial literacy, the more obvious the poverty reduction effect of digital inclusive finance. Rural areas, low levels of financial market participation, low human capital levels, and high relative poverty indices [13] enable households to benefit more from the development of digital inclusive finance. Mechanism research found that digital inclusive finance can reduce relative poverty by promoting commercial insurance allocation, promoting the financial activities participation of rural relative poverty households, and alleviating their credit and financing constraints, with financial literacy playing a positive moderating role [14].

Contrary to the view that digital inclusive finance promotes a reduction in the relative poverty level of households, Shen Yun and other scholars believe that the impact of digital inclusive finance on the vulnerability of rural relative poverty households exists both the "digital dividend" effect and the "digital divide" effect, and the two exhibit an inverted "U" shaped relationship [15]. However, studies by Liu Pengju and others have found a non-linear relationship between digital inclusive finance and household relative poverty. When digital inclusive finance crosses the first threshold of its own development level, the poverty reduction effect is not ideal, and the urban-rural gap widens; after reaching the second threshold, the positive effect remains significant, but there is a tendency for a decrease in the proportion of relative poverty occurrence [16]. Jiang Xiaomin and other scholars even argue that digital inclusive finance significantly increases the probability of relative poverty among migrant households, and this impact is achieved by reducing the social participation of migrant households in the local area [17].

In summary, existing scholars have conducted relatively rich research on the mechanism of digital inclusive finance affecting household relative poverty. However, there is a lack of research on heterogeneity, with relatively low attention paid to factors such as region and age, which may reflect significant differences in poverty reduction effects. Therefore, this study will determine relative poverty samples by taking the median of total household income in the past 12 months as 40%, and combine the mechanism of digital inclusive finance to analyze the perspectives of regional disparities and age heterogeneity as different angles. This will help the academic community to more comprehensively understand the impact of digital inclusive finance on household relative poverty, provide more specific recommendations for policy-making, optimize the development strategy of digital inclusive finance, better serve poverty reduction efforts, achieve more equitable and sustainable economic development, and allow more people to share in the benefits of economic development.

3. Theoretical Framework and Hypotheses

Digital inclusive finance combines digital technology with inclusive finance and has become an advanced tool for poverty reduction in the new era due to its characteristics of low threshold, wide coverage, popularization, and convenience of use. Digital inclusive finance, with its "digitalization" feature, improves the shortcomings of traditional financial services and directly or indirectly impacts residents' relative poverty.

Firstly, digital inclusive finance provides online financial services and products through digital technology, helping low-income groups access online financial services, reducing the cost of accessing financial resources, and thus increasing income. The application of modern digital information technologies such as the Internet in digital inclusive finance can overcome spatial restrictions, optimize information exchange, reduce the impact of financial exclusion (Luo Ruolan, 2022) [18], and alleviate the problems of adverse selection and moral hazard caused by information asymmetry, thereby mitigating residents' relative poverty.

Secondly, digital inclusive finance facilitates inclusive financial growth, reduces financial transaction costs, expands the coverage of financial services, promotes capital circulation, and balances the allocation of financial resources. This enables neglected long-tail customers to access the necessary financial services, stimulates new industries, formats, and employment models, providing more employment opportunities for low-income groups and increasing wage and self-employment income, thereby alleviating residents' relative poverty.

In conclusion, digital inclusive finance can influence residents' relative poverty through multiple pathways, providing residents with more economic opportunities, increasing income, and alleviating relative poverty. Based on this, this paper proposes the following hypotheses:

H1: Digital inclusive finance can alleviate residents' relative poverty.

The use of digital inclusive finance can meet the financial needs of socially disadvantaged groups such as low-income individuals, increase the accessibility of financial products and services, reduce financial exclusion, and enhance financial literacy. China has significant regional disparities between the eastern and western regions and a digital divide issue among youth and elderly groups, leading to different effects of digital inclusive finance on residents' relative poverty.

On one hand, at the regional level, due to the limited assets and imperfect credit systems in underdeveloped western regions, as well as high transportation costs for resources, financial institutions tend to exclude residents from financial services (Fu Lingping, 2022) [19], resulting in differences in the impact of digital inclusive finance on residents' relative poverty between the eastern and western regions.

On the other hand, compared to the elderly, the younger generation has a higher acceptance of new digital devices and smart terminals. Digital inclusive finance is more likely to influence the younger generation than the elderly (Li Qingchuan, 2023) [20]. The use of digital inclusive finance can also improve the lagging digital infrastructure and lower financial literacy levels in some rural and remote areas, thus addressing the issue of the "digital divide." This facilitates the younger generation's access to the digital dividend of digital inclusive finance development, thereby reducing residents' relative poverty. Based on this, this paper proposes the following hypothesis:

H2: Digital inclusive finance has a greater mitigating effect on residents' relative poverty in the western regions and among the younger population.

4. Empirical Design

4.1. Data Source

To verify the impact of digital inclusive finance on household relative poverty, this study employs data from the China Family Panel Studies (CFPS) and the Peking University Digital Financial Inclusion Index of China (PKU-DFIIC) for empirical testing. The data were respectively organized and implemented by the China Social Science Survey Center of Peking University, and jointly compiled by the Peking University Digital Finance Research Center and the Ant Group Research Institute. The data are characterized by large volume and high reliability. The CFPS survey officially began in 2010, defining the families and descendants of the baseline survey conducted in 2010 as the genetic members for subsequent follow-ups, which are conducted every two years. This study examines the impact of digital inclusive finance on household relative poverty using data from 2014 to 2018. To ensure the validity and reliability of the results, the following data processing steps were conducted: (1) selection of relevant variables for this study; (2) handling missing values and outliers; (3) horizontally merging individual-level and household-level data for the years 2014, 2016, and 2018, and then vertically merging the three-year data; (4) horizontally merging the longitudinal panel data from 2014 to 2018 with provincial-level digital inclusive finance index data to obtain the final panel data. After the aforementioned data processing, a total of 71,600 samples were obtained.

4.2. Variable Settings

4.2.1. Dependent Variable

The main dependent variable is relative poverty (replov). Following previous literature, the relative poverty variable is constructed based on the median of total household income in the past 12 months, with 40% serving as the threshold: when the total household income in the past 12 months is less than or equal to this threshold, the household is considered a relative poverty sample and assigned a value of 1; when the total household income in the past 12 months is greater than this threshold, the household is considered a non-relative poverty sample and assigned a value of 0. Additionally, for robustness testing, the median of total household income in the past 12 months is divided by two to construct the relative poverty variable (replov2).

4.2.2. Explanatory Variables

This study selects the digital inclusive finance index, as well as the depth, breadth, and digitization level of digital inclusive finance from provincial-level digital inclusive finance data as standard indicators. These indicators are matched with three years of CFPS data to obtain the target sample. Additionally, to address issues such as non-uniform dimensions and reduce endogeneity, all four indicators are logarithmically transformed.

4.2.3. Control Variables

The first category of indicators related to residents' characteristics includes age, marital status, gender, household registration (hukou), health status, political affiliation, educational level, non-agricultural employment status, and age group. The second category includes indicators related to household characteristics, such as urban-rural classification, eastern-western regional classification, number of household members, social status, and whether anyone is engaged in individual private enterprises. Based on the personal ID and household ID of the sample respondents, each is matched with the characteristics indicator variables from the adult questionnaire and household questionnaire to obtain all target variables based on the respondents' personal variables, household relationships, and household economy.

Table 1. Specific Definitions of Variables

Variable Classification	Variable	Variable Name	Variable Explanation
Dependent Variables	Y	Degree of Poverty	The mean * 40% serves as the boundary.
	Coverage Breadth	lncoverage	Logarithmically transformed
Explanatory Variables	Depth of Use	lndepth	Logarithmically transformed
	Degree of Digitization	lndigital	Logarithmically transformed
	Digital Inclusive Finance	lnfinic	Logarithmically transformed
Control Variables	Age	age	Age (years)
	Gender	sex	1 for male, 0 for female
	Registered Residence	register	1 for non-agricultural residence, 0 for agricultural residence
	Marital Status	marriage	1 for married, 0 for other
	Political Affiliation	politics	1 for party member, 0 for non-member
	1 for party member, 0 for non-member	health	1 = very healthy; 2 = healthy; 3 = comparatively healthy; 4 = average; 5 = unhealthy
	Government Subsidy	subsidy	1 for yes, 0 for no
	Non-agricultural Employment	employment	1 for yes, 0 for no
	Education Level	education	0 for illiterate/semi-literate, 1 for primary school, 2 for junior high school, 3 for high school, 4 for college and above
	Age Group	age_group	1 for age under 60, 0 for age 60 and above
	Family Size	fml	number of family members
	Social Status	status	ranging from 1 to 5, from low to high
	Individual Engaged in Private Business	business	1 for yes, 0 for no
	Eastern Region	east	1 for yes, 0 for no
	Western Region	west	1 for yes, 0 for no
	Urban-rural	urban	1 for urban, 0 for rural

4.3. Model Construction

This study adopts a panel data double fixed-effects model as the basic regression model to construct the model of the impact of digital inclusive finance on residents' relative poverty, as follows:

$$relpov_{it} = \alpha + \beta lncoverage_{it} + \gamma controls_{it} + \mu_i + \lambda_i + \varepsilon_{it} \quad (1)$$

$$relpov_{it} = \alpha + \beta lndepth_{it} + \gamma controls_{it} + \mu_i + \lambda_i + \varepsilon_{it} \quad (2)$$

$$relpov_{it} = \alpha + \beta lnfinic_{it} + \gamma controls_{it} + \mu_i + \lambda_i + \varepsilon_{it} \quad (3)$$

$$relpov_{it} = \alpha + \beta lndigital_{it} + \gamma controls_{it} + \mu_i + \lambda_i + \varepsilon_{it} \quad (4)$$

Where $relpov_{it}$ represents the dependent variable, t represents time, and i represents the region; $controls_{it}$ represents the control variable group, representing the 12 selected control variables, including residents' age, gender, household registration, marital status, political affiliation, health status, educational level, government subsidies, non-agricultural employment, household population, social status, and whether someone is engaged in individual private enterprise; μ_i represents province fixed effects, λ_i represents year fixed effects; α, β, γ are the parameters to be estimated; ε_{it} represents the random disturbance term, containing information about other unobservable factors.

5. Empirical Analysis

5.1. Model Estimation Results

Table 2 presents the regression results of the panel fixed-effects model. The first column shows that, controlling for other variables, digital inclusive finance can significantly alleviate residents' relative poverty at the 1% significance level. Specifically, for every one-unit increase in the total digital inclusive finance index (Infinic), residents' relative poverty index (relpov) decreases by 0.165%. Further exploring the different dimensions of digital inclusive finance, the second, third, and fourth columns respectively display the effects of coverage breadth, usage depth, and digitalization level on residents' relative poverty, while controlling for other variables. The coverage breadth index (lncoverage), usage depth index (lndepth), and digitalization level index (lndigital) all have negative effects on residents' relative poverty, but at different levels of significance. The coverage breadth index can significantly alleviate residents' relative poverty at the 1% significance level, with a decrease of 0.253% in the relative poverty index for every one-unit increase in the coverage breadth index. The usage depth index can moderately alleviate residents' relative poverty at the 10% significance level, with a decrease of 0.054% in the relative poverty index for every one-unit increase in the usage depth index. The digitalization level index can moderately alleviate residents' relative poverty at the 5% significance level, with a decrease of 0.063% in the relative poverty index for every one-unit increase in the digitalization level index. The baseline regression results above demonstrate that digital inclusive finance can mitigate residents' relative poverty, with higher levels of digital inclusive finance associated with lower probabilities of residents' relative poverty, thus verifying hypothesis 1.

Table 2. Impact of Digital Inclusive Finance on Residents' Relative Poverty

VARIABLES	relpov (1)	(2)	(3)	(4)
lnfinic	-0.165***			
	(0.058)			
lncoverage		-0.253***		
		(0.051)		
lndepth			-0.054*	
			(0.029)	
lndigital				-0.063**
				(0.031)
age	-0.001	-0.000	-0.001	-0.001
	(0.004)	(0.004)	(0.004)	(0.004)
sex	0.060	0.060	0.059	0.059
	(0.071)	(0.071)	(0.071)	(0.071)
register	-0.011	-0.011	-0.011	-0.011
	(0.013)	(0.013)	(0.013)	(0.013)
marriage	-0.054***	-0.054***	-0.054***	-0.054***
	(0.012)	(0.012)	(0.012)	(0.012)
politics	0.018	0.018	0.017	0.017
	(0.016)	(0.016)	(0.016)	(0.016)

Table 2. Continued

VARIABLES	relpov (1)	VARIABLES	relpov (1)	VARIABLES
health	0.007***	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
subsidy	-0.031***	-0.032***	-0.031***	-0.030***
	(0.005)	(0.005)	(0.005)	(0.005)
employment	-0.084***	-0.084***	-0.084***	-0.085***
	(0.005)	(0.005)	(0.005)	(0.005)
education	-0.006**	-0.006**	-0.006**	-0.006**
	(0.003)	(0.003)	(0.003)	(0.003)
fml	-0.025***	-0.025***	-0.025***	-0.025***
	(0.002)	(0.002)	(0.002)	(0.002)
status	-0.006***	-0.006***	-0.006***	-0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
business	-0.073***	-0.073***	-0.073***	-0.073***
	(0.009)	(0.009)	(0.009)	(0.009)
Constant	1.343***	1.765***	0.763***	0.134
	(0.348)	(0.312)	(0.230)	(0.250)
Observations	71,600	71,600	71,600	71,600
R-squared	0.028	0.028	0.028	0.028

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the results of controlling variables in Table 2, it can be observed that government subsidies (subsidy) are significantly associated with residents' relative poverty. The higher the government subsidies, the lower the probability of relative poverty among residents, as individuals receive subsidies. Similarly, non-agricultural employment (employment) is also associated with residents' relative poverty, as income from non-agricultural employment is higher than that from agricultural employment, leading to a lower probability of relative poverty among residents. Additionally, an increase in education level (education), family size (fml), marriage, and social status (status) can all mitigate the probability of relative poverty among residents.

5.2. Robustness Test

To demonstrate the robustness of the baseline model and subsequent analysis results, this study conducts robustness tests by replacing the main explanatory variables and changing the regression coefficient estimation method.

Residents' relative poverty can be measured using multiple indicators. While keeping other variables constant, replacing the measure of residents' relative poverty and conducting regression analysis again can test the robustness of the results. For example, whereas the previous analysis defined relative poverty based on households' total income median over the past 12 months at 40%, this study tests the robustness by changing the coefficient to 50%. The following equations are constructed:

$$relpov2_{it} = \alpha + \beta lncoverage_{it} + \gamma controls_{it} + \mu_i + \lambda_i + \varepsilon_{it} \tag{5}$$

$$relpov2_{it} = \alpha + \beta lndepth_{it} + \gamma controls_{it} + \mu_i + \lambda_i + \varepsilon_{it} \tag{6}$$

$$relpov2_{it} = \alpha + \beta lnfinic_{it} + \gamma controls_{it} + \mu_i + \lambda_i + \varepsilon_{it} \tag{7}$$

$$relpov2_{it} = \alpha + \beta lndigital_{it} + \gamma controls_{it} + \mu_i + \lambda_i + \varepsilon_{it} \tag{8}$$

The robust regression results after replacing the explanatory variables are shown in Table 3.

Through regression analysis, it was found that the signs and significance of the core explanatory variables remained basically the same, indicating that the regression results of the core explanatory variables remained valid. Controlling for other variables, digital inclusive finance still significantly alleviated relative poverty among residents at the 1% significance level. For every unit increase in the total index of digital inclusive finance (Infinic), the relative poverty index (relpov) among residents decreased by 0.161%. Further exploration into different dimensions of digital inclusive finance revealed that the coverage index (lncoverage) and the digitalization index (lndigital) remained significantly negative, while the depth index (lndepth) was not significant at the 10% level. Even with a change in the indicator measuring relative poverty among residents, the overall results remained significant, indicating a clear economic effect of digital inclusive finance in alleviating relative poverty among residents.

Table 3. Robustness Test by Replacing Explanatory Variables

VARIABLES	relpov2 (1)	(2)	(3)	(4)
lnfinic	-0.161***			
	(0.060)			
lncoverage		-0.279***		
		(0.053)		
lndepth			-0.046	
			(0.030)	
Indigital				-0.076**
				(0.032)
register	-0.008	-0.002	-0.046	-0.076**
	(0.014)	(0.004)	(0.030)	(0.032)
marriage	-0.059***	-0.006	-0.003	-0.003
	(0.013)	(0.074)	(0.004)	(0.004)
politics	0.009	-0.008	-0.007	-0.008
	(0.017)	(0.014)	(0.074)	(0.074)
health	0.006***	-0.059***	-0.008	-0.007
	(0.002)	(0.013)	(0.014)	(0.014)
subsidy	-0.022***	0.009	-0.059***	-0.060***
	(0.005)	(0.017)	(0.013)	(0.013)
employment	-0.080***	0.006**	0.009	0.008
	(0.005)	(0.002)	(0.017)	(0.017)
education	-0.004	-0.023***	0.006***	0.006***
	(0.003)	(0.005)	(0.002)	(0.002)
fml	-0.028***	-0.080***	-0.021***	-0.021***
	(0.002)	(0.005)	(0.005)	(0.005)
status	-0.005**	-0.004	-0.080***	-0.081***
	(0.002)	(0.003)	(0.005)	(0.005)
business	-0.074***	-0.029***	-0.005	-0.005
	(0.009)	(0.002)	(0.003)	(0.003)
2016.year	0.040**	-0.005**	-0.028***	-0.028***
	(0.018)	(0.002)	(0.002)	(0.002)
2018.year	0.022	-0.074***	-0.005**	-0.005**
	(0.036)	(0.009)	(0.002)	(0.002)
Constant	1.490***	0.058***	-0.074***	-0.074***
	(0.362)	(0.015)	(0.009)	(0.009)
		0.081**	0.016	-0.017
Observations	71,600	(0.032)	(0.014)	(0.012)
R-squared	0.028	(0.324)	(0.027)	(0.022)

5.3. Heterogeneity Analysis

5.3.1. Regional Heterogeneity

Currently, there is uneven development between eastern and western regions in China, with significant binary structural characteristics. There are differences in the completeness of digital infrastructure between eastern and western regions, leading to digital barriers. The economically underdeveloped western regions, coupled with incomplete credit systems, face financial exclusion from financial institutions, resulting in differences in the impact of digital inclusive finance on relative poverty between eastern and western regions. To examine whether there are regional differences in the impact of digital inclusive finance on relative poverty among residents, this study divides residents into eastern and western regions based on their geographical location. Regression analyses are conducted separately for the two groups of residents according to Model (1) and Model (2). The regression coefficient estimation results are shown in Table 4 below.

Table 4. Regional Heterogeneity

VARIABLES	east m1 relpov	west m2 relpov
lnfinic	-0.459***	-0.249
	(0.080)	(0.280)
age	-0.000	0.001
	(0.006)	(0.007)
sex	-0.047	0.130
	(0.099)	(0.143)
register	-0.018	-0.018
	(0.016)	(0.031)
marriage	-0.061***	-0.078***
	(0.015)	(0.026)
politics	0.006	0.083**
	(0.022)	(0.033)
health	0.003	0.015***
	(0.003)	(0.004)
subsidy	-0.028***	-0.038***
	(0.007)	(0.010)
employment	-0.041***	-0.112***
	(0.007)	(0.010)
education	-0.002	-0.006
	(0.004)	(0.005)
fml	-0.030***	-0.019***
	(0.003)	(0.004)
status	-0.001	-0.010**
	(0.003)	(0.004)
business	-0.058***	-0.118***
	(0.011)	(0.019)
Constant	2.872***	1.778
	(0.503)	(1.451)
Observations	34,493	21,052
R-squared	0.021	0.038

Through regression results, it was found that digital inclusive finance significantly alleviates the likelihood of relative poverty among residents in the eastern region. However, digital inclusive finance is only significant for the regression results of residents in the eastern region, while not significant for residents in the western region, indicating regional heterogeneity and confirming hypothesis 3.

5.3.2. Age Heterogeneity

Currently in China, there is a significant digital generation gap issue among the elderly population, as they have weaker acceptance of new digital devices and smart terminals compared to younger age groups, resulting in a smaller impact of digital inclusive finance on them. To investigate whether there are age differences in the impact of digital inclusive finance on relative poverty among residents, this study divides residents into elderly and non-elderly groups based on their age categories. Regression analyses are conducted separately for the two groups of residents according to Model (1) and Model (2). The regression coefficient estimation results are shown in Table 5 below.

The regression results indicate that digital inclusive finance significantly reduces the likelihood of relative poverty among non-elderly residents. However, digital inclusive finance only significantly affects the regression results for non-elderly residents, while the results for elderly residents are not significant, demonstrating age-group heterogeneity and confirming Hypothesis 3.

Table 5. Age Heterogeneity

VARIABLES	<60 m1 relpov	≥60 m2 relpov
lnfinic	-0.207***	0.136
	(0.064)	(0.144)
age	-0.006	-0.016
	(0.005)	(0.018)
sex	0.121	-0.723***
	(0.076)	(0.233)
register	-0.007	-0.005
	(0.015)	(0.030)
marriage	-0.056***	-0.045
	(0.013)	(0.031)
politics	0.021	-0.023
	(0.019)	(0.038)
health	0.007***	0.006
	(0.002)	(0.005)
subsidy	-0.027***	-0.049***
	(0.006)	(0.011)
employment	-0.076***	-0.114***
	(0.005)	(0.012)
education	-0.007**	0.001
	(0.004)	(0.005)
fml	-0.019***	-0.044***
	(0.002)	(0.005)
status	-0.007***	-0.005
	(0.003)	(0.004)
business	-0.064***	-0.120***
	(0.009)	(0.024)
Constant	1.654***	1.380
	(0.383)	(1.455)
Observations	56,125	15,475
R-squared	0.025	0.049

References

[1] Chen, P., & Wang, S. (2022). Digital inclusive finance, digital divide, and multidimensional relative poverty—Based on the perspective of aging. *Exploration of Economic Issues*, (10), 173-190.

[2] China Macroeconomic Forum. (2021). China's relative poverty issue after building a moderately prosperous society [Report]. Economic Research Institute, Renmin University of China.

[3] Duan, Z., & Yuan, F. (2024, March 26). Empirical study on the slowing down of rural multidimensional relative poverty by digital financial development. *Management Journal*, 1-21. Retrieved from http://kns.cnki.net/kcms/detail/41.1408.F.20240322.0957.002.html

[4] Fu, L. (2022). Research on the impact of digital inclusive finance on the relative poverty of resident families [Doctoral dissertation, Northwest Agriculture and Forestry University]. https://doi.org/10.27409/d.cnki.gxbnu.2022.001146

[5] Jiang, X., Zhou, Z., & Zhang, B. (2022). Digital inclusive finance and relative poverty of floating population families. *Journal of Central University of Finance and Economics, 2022*(03), 45-58. https://doi.org/10.19681/j.cnki.jcufe.2022.03.003

[6] Jiao, J. (2010). The importance of building an inclusive financial system. *China Finance*, 10, 12-13.

[7] Li, Q. (2023). Research on the impact of digital inclusive finance on the relative poverty of residents' families [Doctoral dissertation, Shandong University of Finance and Economics]. https://doi.org/10.27274/d.cnki.gsdjc.2023.000093

[8] Li, Z., Li, Y., Liu, S., et al. The impact effect of digital inclusive finance on relative poverty in rural families—Based on survey data of farmers in Ningxia. *Modernization of Agriculture Research*.

[9] Liu, P., Zhang, Y., & Zhou, S. (2022). Does digital inclusive finance inhibit household relative poverty? *Modern Finance (Journal of Tianjin University of Finance & Economics)*, 42(07), 20-36. https://doi.org/10.19559/j.cnki.12-1387.2022.07.002

[10] Liu, W. (2021). The impact of digital inclusive finance on residents' relative poverty. *Journal of South China Agricultural University (Social Science Edition)*, 20(06), 65-77.

[11] Luo, R. (2022). Research on the impact of digital inclusive finance on residents' subjective poverty alleviation [Doctoral dissertation, Hunan University]. https://doi.org/10.27135/d.cnki.ghudu.2022.003335

[12] Sen, A. (2001). *Poverty and famine: On rights and deprivation* (W. Yu & W. Wang, Trans.). Beijing: The Commercial Press.

[13] Shen, Y., & Li, J. (2022). Digital inclusive finance and vulnerability of rural household relative poverty. *Journal of South China Agricultural University (Social Science Edition)*, 21(01), 105-117.

[14] Sun, J., & Yang, X. (2022). Inclusive finance, digital divide, and common prosperity—Based on the perspective of relieving rural relative poverty. *Financial Forum*, 27(10), 13-22. https://doi.org/10.16529/j.cnki.11-4613/f.2022.10.001

[15] Tao, Z. (2022). Study on the alleviation effect of digital inclusive finance on relative poverty in China [Doctoral dissertation, Hubei University]. https://doi.org/10.27130/d.cnki.ghubu.2021.000510

[16] Xi, J. (2021, February 26). Speech at the National Conference on Summing Up and Commending the Fight Against Poverty [Speech]. *People's Daily*, 002. https://doi.org/10.28655/n.cnki.nrmrb.2021.001951

[17] Yang, X., Ye, J., Zhuo, Z., et al. (2023). Digital inclusive finance, multidimensional relative poverty, and spatial effects. *Financial and Economic Sciences, 2023*(05), 48-61.

[18] Yang, Y., & Sun, X. (2022). Digital inclusive finance and urban relative poverty—Empirical evidence from the Yangtze River Delta region. *World Economic Review, 2022*(05), 19-35.

[19] Zhang, T., & Ma, S. (2023). Digital inclusive finance and common prosperity—Based on the perspective of household relative poverty. *Wuhan Finance, 2023*(12), 12-21.

[20] Zou, J., & Deng, X. (2022). Digital inclusive finance, financial literacy, and household income poverty. *Industrial Economic Review, 2022*(05), 70-85. https://doi.org/10.19313/i.cnki.cn10-1223/f.2022.05.007