

The Impact of Digital Inclusive Finance on Household Consumption: Empirical Analysis Based on the Yangtze River Economic Belt

Yutong Wei¹, Qiong Wang^{1, 2, *}

¹ School of Business, Jiangnan University, Hubei Wuhan 430056, China

² Manufacturing Industry Development and Research Center on Wuhan City Circle, Hubei Wuhan 430056, China

* Corresponding author

Abstract: Improving residents' consumption level is one of the important goals of China's economic development, and digital inclusive finance, as the key work of financial development, has a non-negligible impact on residents' consumption. Based on the panel data of 11 provinces and cities in the Yangtze River Economic Belt from 2016 to 2022, this paper empirically analyzes the relationship between digital financial inclusion and household consumption by using the fixed-effect model and considering the endogenous problem. The findings are as follows: First, digital inclusive finance promotes the improvement of residents' consumption level, and this result is robust; Second, the mechanism analysis results show that digital inclusive finance can improve residents' consumption level through increasing residents' income, digital insurance and consumer credit. Thirdly, from the perspective of regional and urban-rural heterogeneity analysis, it is found that the promoting effect of digital inclusive finance on residents' consumption is more obvious in the middle reaches of the Yangtze River Economic Belt, while the promoting effect of digital inclusive finance on rural residents' consumption is more significant. Based on this, relevant policy recommendations are put forward, and the Yangtze River Economic Belt region should improve the relevant policies and regulations of digital inclusive finance, driving progress in the digital insurance industry, promote financial technology innovation and differentiated development of digital inclusive finance.

Keywords: Digital financial inclusion; Household consumption; Mechanism test; heterogeneity.

1. Introduction

Consumption is an important factor affecting people's quality of life and sense of happiness, and also an important driving force and support for economic growth. In recent years, the state has issued a series of documents emphasizing the importance of consumption. The Central Economic Work Conference in 2022 pointed out that "we should give priority to restoring and expanding consumption", and the Ministry of Commerce positioned 2023 as the "Year of Consumption Boost". The Central Economic Work Conference in 2023 took "focusing on expanding domestic demand, stimulating potential consumption, and promoting consumption from post-epidemic recovery to sustained expansion" as the key work of 2024, and the Ministry of Commerce also positioned 2024 as the "Year of Consumption Promotion". How to promote consumption is worth attention.

As the core of modern economy, finance plays a very important role in expanding consumption and promoting growth. Digital inclusive finance reflects the deep combination of fintech and inclusive finance, and also represents the classic application of scientific and technological innovation in financial services. In October 2023, the State Council proposed to "orderly promote the development of digital inclusive finance". In November 2023, the Central Financial Work Conference took "digital finance" and "inclusive finance" as the "five major articles" for providing high-quality financial services. The development of digital inclusive finance will be a key way to stimulate the consumption potential of the whole society.

The Yangtze River Economic Belt covers 11 provinces and cities along the river, accounting for half of the country in

terms of population size and economic aggregate. By 2021, the GDP of the Yangtze River Economic Belt accounted for 46.3% of the country, the population accounted for about 43%, and the consumption accounted for 50.3%. Chinese-style modernization is closely linked with the satisfaction of people's consumption needs for a better life. Therefore, maintaining the growth trend of consumption in the Yangtze River Economic Belt will provide more impetus for Chinese-style modernization

2. Literature Review and Theoretical Hypothesis

Many domestic scholars have conducted extensive research on the relationship between digital inclusive finance and consumer consumption. Most of the existing literatures affirm the positive effect of digital inclusive finance on the improvement of residents' consumption level. Yi Xingjian and Zhou Li (2018) ^[1], Xie Jiazhi and Wu Jingru (2020) ^[2], based on the micro-data analysis of Chinese households, believe that the development of digital inclusive finance in China has significantly promoted residents' consumption mainly by easing liquidity constraints and facilitating payment. Zou Xinyue and Wang Wang (2020) ^[3], LAN Leqin and Yang Zhuoran (2021) ^[4] used provincial panel data to demonstrate that digital inclusive finance can significantly improve residents' consumption level; Wang Jinghe and Shen Yang (2023) further confirmed that digital financial inclusion can significantly increase total household consumption expenditure by using the micro-data of China's Comprehensive Survey of Social Conditions (CSS) ^[5]. However, through further analysis, scholars also found that the effect of digital inclusive finance on residents'

consumption is heterogeneous, and the impact of digital inclusive finance on residents' consumption in eastern, central and western regions and on urban and rural residents' consumption is different. Qi Hongqian and Liu Qianhan (2022) analyzed the data of China Household Finance Survey (CHFS) and concluded that the development of digital inclusive finance has made the consumption level of residents in central China converge with that in eastern China, while the consumption tendency of residents in western China has been significantly improved [6]. Fang Xianming et al. (2023) analyzed provincial panel data and concluded that the positive effect of digital inclusive finance on residents' consumption is strongest in the western region [7]. Xue Qitong and Feng Sixian (2022) believe that digital inclusive finance has the characteristics of convenience, speed and inclusiveness, and will bring greater changes to rural residents' living and consumption patterns [8]. Zhou Caiyun and Yang Yijie (2023) [9], Fan Fangzhi and Peng Tiantian (2023) [10] believe that the impact of digital inclusive finance on rural residents' consumption shows obvious regional differences, and the promotion effect on the western region is the most significant. Accordingly, research hypothesis 1 is proposed as follows:

Hypothesis 1: Digital financial inclusion can promote household consumption, but there are regional and urban and rural differences in this promotion.

Keynes's absolute income hypothesis holds that there is a stable functional relationship between consumption and income, and with the increase of income, consumption will also increase. Yang et al. (2020) believed that digital inclusive finance directly affects residents' income from three aspects, including coverage breadth, depth of use and degree of digitalization, and pointed out that digital inclusive finance can also indirectly improve residents' income level by stimulating residents to start businesses [11]. Li Wenxiu and Liu Junjie (2023) further demonstrated that digital inclusive finance uses the wide coverage of financial services to stimulate the entrepreneurial enthusiasm of farmers and low-income groups to increase residents' operating income, and increases residents' expected property income by expanding the depth of financial use. Digital technology is used to alleviate financing constraints of small and micro enterprises, provide more jobs, increase residents' wage income and other ways to indirectly stimulate household consumption [12]. Chen and Chang (2024) believed that digital inclusive finance made full use of its advantages in economies of scale and scope, expanded residents' investment channels for small funds, improved residents' return on investment, and promoted residents' wealth growth and consumption growth [13]. Based on this, hypothesis 2 is proposed as follows:

Hypothesis 2: Digital inclusive finance increases household consumption by increasing household income.

Digital insurance also has a non-negligible value in promoting the welfare of individuals and enterprises as well as social stability and fairness. With the continuous progress of science and technology, residents expect to enjoy more convenient, personalized and intelligent insurance services, which may prompt residents to increase consumption expenditure. Therefore, what role digital insurance plays in the impact of digital inclusive finance on consumption has attracted the attention of scholars. Tang (2020) further discussed how the development of digital inclusive finance can help residents more conveniently obtain insurance services related to their own needs. This not only expands the business field of digital insurance, but also increases the

consumption expenditure of residents by reducing the uncertainty of their future income, reducing the proportion of potential risks and reserves [14]. Feng and Song (2021) believed that digital insurance, by taking advantage of its technical advantages, can provide insurance services in different regions and allow consumers to negotiate and sign insurance contracts without being constrained by time, which not only reduces the sales cost of insurance, but also ultimately benefits consumers, thus improving the quality of life and consumption level of residents [15]. An et al. (2023) believed that due to its advantages of wide coverage and low cost, digital inclusive financial services, on the one hand, enhance residents' willingness to participate in insurance, on the other hand, reduce the risk cost of social security institutions, provide an important guarantee for the upgrading of residents' consumption structure, and promote the improvement of residents' consumption level [16]. Based on this, hypothesis 3 is proposed as follows:

Hypothesis 3: Digital inclusive finance increases household consumption by increasing digital insurance.

The emergence of consumer credit provides a source of funds for the residents who are currently short of funds, which helps to release the consumption demand suppressed by the shortage of funds, and then increases the consumption expenditure of residents. Therefore, the issue of how digital inclusive finance acts on residents' consumption through consumer credit has attracted the attention of scholars. Wang and Wang (2022) found that with the progress of digital inclusive finance, the accessibility of consumer credit to residents has been enhanced. By enabling residents to get rid of the constraints of small loans, the liquidity constraints of residents can be alleviated, and the income growth can be promoted, thus promoting the growth of household consumption [17]. Yao et al. (2022) mainly discussed how the availability of household credit affects the marginal consumption trend, and digital inclusive finance promotes the increase of household credit [18]. Tan et al. (2023) believed that digital inclusive finance can reduce the cost caused by information asymmetry by promoting information sharing, thus enhancing the credit supply capacity of financial institutions. The increase of credit supply has fundamentally stimulated residents' consumption desire and increased the proportion of consumption in the total income, thus effectively improving the stable growth of the quality and quantity of Chinese residents' consumption [19]. Based on this, hypothesis 4 is proposed as follows:

Hypothesis 4: Digital inclusive finance increases household consumption by increasing consumer credit.

3. Model Construction and Data Selection

3.1. Data source and variable selection

This paper selects the panel data and digital inclusive financial index of 11 provinces and cities in the Yangtze River Economic Belt from 2016 to 2022 for research and analysis. The main sources of data are China City Statistical Yearbook and EPS data platform. Some of the variables were processed in natural logarithm to make the data more representative.

3.1.1. Explanatory variables and explained variables

Peking University Digital Inclusive Financial Index (Index) is the explanatory variable of this paper, and the total index of digital inclusive financial is used as the explanatory variable in the benchmark regression. The explained variable in this

paper is the household consumption (Consume), which is measured by the annual per capita consumption expenditure of each province and city.

3.1.2. Mediating variables and control variables

The mediating variables selected in this paper are household income (RI), digital insurance (EI) and consumer credit (Loan). In order to prevent endogeneity problems caused by the omission of important variables, we refer to the practice of Xiang (2022) [20] and Li and Li (2023) [21], and select variables that have a certain impact on household consumption, so as to more accurately reflect the relationship between explanatory variables and explained variables. The control variables in this paper include Income gap between

urban and rural residents (Income), urbanization rate (Ur), Fiscal expenditure (Fiscal), unemployment rate (Unemp), economic development level (Eco), government fiscal expenditure (Gov), Road infrastructure (Road), and foreign economic and trade (Open).

3.1.3. Descriptive statistics

All variables are winnowed, among which, the four variables of per capita consumption expenditure of residents, digital inclusive financial index, local general public budget expenditure and actual urban road area at the end of the year are log processed, and the interpolation method is used to make up for part of the missing data. Table 1 shows the descriptive statistical results of the variables.

Table 1. Selection and definition of main variables

Variable	Description of variables	N	mean	sd	min	max
Consume	Per capita consumption expenditure	784	9.86	0.33	9.05	10.8
Index	Digital Financial Inclusion Index	784	5.51	0.16	5.11	5.89
Income	Disposable income of urban residents/disposable income of rural residents	784	2.2	0.35	1.56	3.27
Ur	Urban population/total population	784	56.62	12.46	21.99	89.33
Fiscal	Fiscal expenditure /GDP	784	17.8	8.71	1.07	54
Unemp	Number of unemployed/number of labor force	784	2.93	0.78	0.6	5.5
Eco	GDP per capita	784	11.03	0.54	9.55	15.68
Gov	Local general public budget expenditures	784	6.1	0.71	4.55	9.15
Road	There is actually urban road area at the end of the year	784	7.5	0.91	4.94	10.41
Open	Import of goods/export of goods	784	1.29	14.94	0	409.9
Indus	The proportion of tertiary industry in regional GDP	784	46.85	7.49	26.12	74.1

3.2. Model construction

3.2.1. Reference regression model

$$Consume_{it} = \alpha_0 + \alpha_1 Index_{it} + \alpha_2 Control_{it} + \delta_i + \mu_t + \varepsilon_{it} \quad (1)$$

Where, t and i indicate year and city respectively; Consume indicates household consumption level. Index stands for digital financial inclusion index; Control indicates the control variable. ε is the random disturbance term; δ and μ represent province and time fixed effects, respectively.

3.2.2. Mediation mechanism test

With reference to the practice of Wen Zhonglin and Ye Baojuan (2014) [22] and on the basis of formula (1), this paper uses step-by-step regression method to build an intermediary effect model, and takes resident income (RI), digital insurance (EI) and consumer credit (Loan) as intermediary variables, respectively, to study the impact mechanism of digital inclusive finance on resident consumption. The following model is set up to test the mediation mechanism:

$$Consume_{it} = \gamma_0 + \gamma_1 Index_{it} + \gamma_2 Control_{it} + \delta_i + \mu_t + \varepsilon_{it} \quad (2)$$

$$M_{it} = \beta_0 + \beta_1 Index_{it} + \beta_2 Control_{it} + \delta_i + \mu_t + \varepsilon_{it} \quad (3)$$

$$Consume_{it} = \theta_0 + \theta_1 Index_{it} + \theta_2 Control_{it} + \theta_3 M_{it} + \delta_i + \mu_t + \varepsilon_{it} \quad (4)$$

Where, M_{it} is the intermediary variable, and other

variables are the same as formula (1).

4. Empirical Test and Result analysis

4.1. Benchmark regression analysis

This paper selects the fixed effect model for benchmark regression, and Table 2 shows the benchmark regression results, among which the results in Column (1) show that digital inclusive finance has significantly promoted the level of household consumption. The subsequent columns (2) - (10) are the regression results after the control variables are gradually added. The regression coefficient changes from 1.113 in Column (1) to 0.881 in Column (10), and both show a significant promoting effect at the level of 1%, which means that the higher the digital inclusive financial index is, the higher the household consumption level is. The reason for this is that digital inclusive finance originates from microfinance. At the same time, it can also reach groups that cannot be reached by traditional financial methods, such as rural residents and small and micro enterprises, so as to expand the service scope, gradually form a situation of healthy competition between traditional finance and digital finance, and stimulate the self-improvement and improvement of market regulation ability. The emergence of digital inclusive finance enables people to obtain the financial support they need at a lower price, thus generating more consumption power. The goal of providing financial services to vulnerable groups at an affordable cost is being gradually achieved, which provides a solid backing for improving residents' consumption power. To sum up, digital inclusive finance promotes the improvement of residents' consumption level, and Hypothesis 1 is established.

Table 2. Benchmark regression results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Consume	Consume	Consume	Consume	Consume	Consume	Consume	Consume	Consume	Consume
Index	1.113*** (0.020)	0.957*** (0.031)	0.923*** (0.033)	0.923*** (0.034)	0.921*** (0.033)	0.945*** (0.037)	0.913*** (0.044)	0.910*** (0.044)	0.909*** (0.044)	0.881*** (0.042)
Income		-0.322*** (0.050)	-0.320*** (0.051)	-0.320*** (0.053)	-0.323*** (0.052)	-0.321*** (0.052)	-0.324*** (0.053)	-0.316*** (0.055)	-0.313*** (0.055)	-0.318*** (0.055)
Ur			0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.001** (0.001)	0.001** (0.001)	0.001** (0.001)	0.001** (0.001)
Fiscal				0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Unemp					-0.002 (0.004)	-0.002 (0.004)	-0.001 (0.004)	-0.001 (0.004)	-0.001 (0.004)	-0.001 (0.004)
Eco						-0.021 (0.013)	-0.020 (0.013)	-0.021 (0.013)	-0.020 (0.013)	-0.019 (0.012)
Gov							0.049* (0.026)	0.049* (0.026)	0.051* (0.026)	0.048* (0.025)
Road								0.005 (0.011)	0.005 (0.011)	0.002 (0.011)
Open									0.000*** (0.000)	0.000*** (0.000)
Indus										0.002** (0.001)
cons	3.729*** (0.108)	5.296*** (0.267)	5.376*** (0.271)	5.378*** (0.280)	5.406*** (0.273)	5.504*** (0.280)	5.395*** (0.281)	5.359*** (0.291)	5.346*** (0.290)	5.452*** (0.291)
N	784.000	784.000	784.000	784.000	784.000	784.000	784.000	784.000	784.000	784.000
R ²	0.889	0.896	0.898	0.898	0.898	0.899	0.900	0.900	0.900	0.901
year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
province	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: ***, ** and * indicate statistical significance at the level of 1%, 5% and 10%, respectively. Same as below

4.2. Analysis of intermediary mechanism

4.2.1. Mechanism analysis based on residents' income

With the progress of digital inclusive finance, it can gradually promote the development of the overall economy, create more business opportunities and jobs for the society, and create a good macro environment for the improvement of residents' income. Liu et al. (2019) [23] found that digital inclusive finance can promote the improvement of residents' income level, so this paper takes residents' per capita income level (RI) as an intermediary variable. The regression results in Column (1) of Table 3 show that the effect of digital inclusive finance on improving residents' consumption level is 0.881 under the premise of not introducing the mediating effect. At present, the average income level of residents in the Yangtze River Economic Belt is not high, and the small number of middle class is an important factor leading to the lack of domestic consumption demand. Therefore, increasing residents' income can create a favorable condition for stimulating and stimulating domestic demand, thus providing a strong impetus for economic development. It is clearly pointed out in Column (2) of Table 3 that digital inclusive finance can significantly promote the increase of residents' income at the level of 1%, with a coefficient of 0.919. When the intermediary variable of residents' income is included in the regression analysis, according to Column (3) of Table 3, through the regression analysis, it is found that digital inclusive finance is still significant in improving the level of residents' consumption. This shows that digital inclusive finance increases household consumption by increasing household income. Hypothesis 2 holds.

4.2.2. Mechanism analysis based on digital insurance

With the progress of digital inclusive finance, a large number of digital insurance products have been born, which also makes insurance services more accessible, especially for those who are difficult to be covered by the traditional financial system. The development of digital economy also

provides an opportunity for the development of digital insurance. Driven by digital technology, more and more residents are using the Internet to buy insurance. This will further promote the development of e-commerce and digital payment, and also provide a broad market for digital insurance. Moreover, it can increase the participation in insurance, reduce residents' uncertain expectations for the future, and thus improve their current consumption level. A higher level of social security leads to lower precautionary saving, which increases consumption. In this paper, the number of urban workers participating in basic old-age insurance (EI) is taken as the proxy variable, and the data are processed by logarithm. Column (4) of Table 3 shows that the increase of digital inclusive finance in promoting digital insurance is significant at the level of 1%, with a coefficient of 0.735. From the regression results in Column (5) of Table 3, it can be seen that when the variable of digital insurance (EI) is added to the explanatory variable, the result is still significant, and the regression coefficient increases to 0.866, indicating that digital inclusive finance increases household consumption by increasing digital insurance. Hypothesis 3 holds.

4.2.3. Mechanism analysis based on consumer credit

This paper introduces the balance of RMB loans (Loan) of financial institutions at the end of the year as the proxy variable of consumer credit, and investigates whether digital inclusive finance can indirectly promote the level of household consumption by increasing consumer credit. Digital inclusive finance not only broadens the service scope of consumer credit, but also gives more people the opportunity to have more convenient access to credit resources to meet their diversified consumer needs. Moreover, the application of digital technology not only improves the efficiency and accuracy of credit assessment, but also reduces the difficulty of obtaining consumer credit, thus making it possible for more people to obtain credit support. In addition, the development of digital inclusive finance can also provide

credit support for new ventures and small and micro enterprises, thus indirectly boosting household consumption. For example, small loans, start-up loans and supply chain finance can help entrepreneurs and small and micro enterprises obtain financing, promote their business development, and thus increase employment and consumption. Column (6) of Table 3 shows that digital inclusive finance significantly promotes consumer credit,

with a coefficient of 1.579. From the regression results in Column (7) of Table 3, it can be seen that when consumer credit is added to the explanatory variable for regression analysis, the impact of digital inclusive finance on improving the level of household consumption is still significant, and the regression coefficient is 0.704, indicating that digital inclusive finance increases household consumption by increasing consumer credit. Hypothesis 4 holds.

Table 3. Mediating mechanism effect

	(1) Consume	(2) RI	(3) Consume	(4) EI	(5) Consume	(6) Loan	(7) Consume
Index	0.881*** (20.807)	0.919*** (27.872)	0.660*** (11.050)	0.735*** (5.708)	0.866*** (20.104)	1.579*** (14.174)	0.704*** (10.136)
RI			0.240*** (4.169)				
EI					0.019 (1.238)		
Loan							0.112** (3.173)
Income	-0.318*** (-5.764)	-0.415*** (-7.135)	-0.218** (-3.272)	-0.526* (-2.603)	-0.308*** (-5.442)	-0.618*** (-5.922)	-0.248*** (-4.169)
Ur	0.001* (2.314)	0.001* (2.069)	0.001* (2.054)	0.003 (1.882)	0.001* (2.273)	0.001 (1.437)	0.001* (2.163)
Fiscal	-0.000 (-0.872)	-0.001* (-2.495)	-0.000 (-0.375)	0.002 (1.421)	-0.001 (-0.992)	-0.003*** (-4.027)	-0.000 (-0.204)
Unemp	-0.001 (-0.327)	0.001 (0.196)	-0.002 (-0.366)	-0.004 (-0.269)	-0.001 (-0.308)	-0.003 (-0.281)	-0.001 (-0.258)
Eco	-0.019 (-1.524)	-0.025* (-2.176)	-0.013 (-1.256)	0.015 (0.807)	-0.019 (-1.531)	-0.026* (-2.045)	-0.016 (-1.355)
Gov	0.048 (1.886)	0.091*** (3.476)	0.026 (1.125)	-0.005 (-0.099)	0.048 (1.900)	0.298* (2.298)	0.015 (0.704)
Road	0.002 (0.227)	0.018* (2.347)	-0.002 (-0.199)	-0.039 (-1.447)	0.003 (0.301)	0.020 (1.309)	0.000 (0.015)
Open	0.000*** (8.518)	-0.000*** (-10.314)	0.000*** (9.441)	-0.000** (-2.770)	0.000*** (8.601)	-0.000*** (-4.423)	0.000*** (8.804)
Indus	0.002* (2.445)	0.001 (1.940)	0.001* (2.069)	0.004 (1.286)	0.002* (2.326)	0.000 (0.239)	0.002* (2.398)
cons	5.452*** (18.728)	5.594*** (22.775)	4.108*** (9.074)	1.312 (1.202)	5.427*** (18.537)	-1.188 (-1.903)	5.586*** (19.961)
N	784	784	784	784	784	784	784
R ²	0.901	0.931	0.906	0.611	0.901	0.941	0.903

4.3. Analysis of heterogeneity

4.3.1. Regional heterogeneity

In order to further explore whether the promotion effect of digital inclusive finance on household consumption is different in the 11 provinces and cities along the Yangtze River Economic Belt due to differences in geographical location and economic development level, this paper conducts regression analysis on the panel data in the middle and lower reaches of the Yangtze River Economic Belt during the investigation period. From columns (1) - (3) of Table 4, it can be seen that no matter in the upstream, middle and downstream regions, the promotion effect of digital inclusive finance on household consumption is very significant. However, digital inclusive finance plays the largest role in promoting the consumption level of residents in the midstream region, followed by the downstream region, and finally the upstream region. The reason may be that the midstream region is relatively flat and is an important agricultural area and industrial base.

4.3.2. Urban-rural heterogeneity

In view of the differences in disposable income and

consumption concepts between urban residents and rural residents, the demand and choice of financial services and consumption also show obvious differences. Therefore, it is necessary to analyze the differences between urban and rural areas. In this paper, the explained variable is replaced by the consumption level of urban residents and the consumption level of rural residents respectively. It can be clearly observed from Table 4 that the explanatory variable digital inclusive finance (Index) independently evaluates the consumption of urban and rural residents, and the results are all significant at the level of 1%, which indicates that digital inclusive finance has an obvious positive effect on the consumption of urban and rural residents. In rural areas, although traditional financial services are relatively scarce, with the wide spread of digital technology, rural residents' acceptance and frequency of digital inclusive finance have been rising, which has significantly improved their consumption level. This can be easily seen in Columns (4) and (5) of Table 4. That is, the digital inclusive financial index plays a greater role in promoting the consumption level of rural residents than that of urban residents. (0.901 vs 0.754).

Table 4. Heterogeneity analysis of digital inclusive finance

	(1) upstream	(2) middle	(3) downstream	(4) Urban	(5) Countryside
Index	0.736*** (7.876)	0.958*** (16.902)	0.908*** (9.756)	0.754*** (0.035)	0.901*** (0.042)
Income	-0.442*** (-2.955)	-0.233*** (-3.645)	-0.178 (-1.603)	-0.124* (0.054)	-0.626*** (0.072)
Ur	(0.000) (-0.300)	0.001 (1.176)	0.003** (2.682)	0.002* (0.001)	0.002** (0.000)
Fiscal	0.001 (1.090)	(0.000) (-0.267)	-0.005** (-2.687)	-0.000 (0.000)	-0.001 (0.001)
Unemp	0.010 (0.808)	-0.019*** (-2.802)	0.003 (0.336)	0.001 (0.005)	-0.001 (0.006)
Eco	-0.007 (-1.400)	-0.035** (-2.173)	-0.072 (-1.037)	-0.014* (0.007)	-0.012 (0.008)
Gov	0.092 (1.648)	(0.000) (-0.005)	0.167** (2.638)	0.068** (0.021)	0.065** (0.021)
Road	0.002 (0.068)	0.010 (0.809)	-0.028 (-1.111)	0.005 (0.010)	0.004 (0.010)
Open	0.000*** (5.475)	-0.017*** (-3.357)	0.006 (0.829)	0.000*** (0.000)	-0.000 (0.000)
Indus	0.002 (1.595)	0.003** (2.561)	-0.001 (-0.908)	0.002** (0.001)	0.004*** (0.001)
cons	6.237*** (7.015)	5.200*** (13.263)	5.196*** (7.374)	5.723*** (0.262)	5.385*** (0.353)
N	231.000	266.000	287.000	784.000	784.000
R ²	0.906	0.937	0.892	0.886	0.931

4.4. Robustness test

In this paper, the robustness test is carried out by the method that all the digital inclusive financial indexes in Formula (1) - (4) are lagged by one period (denoted as L.). Although the benchmark regression coefficient in Column (1)

drops from 0.881 to 0.781, it still has a positive promotion effect, which is basically consistent with the above regression results. According to the mechanism robustness test conducted in columns (2) - (7), although the coefficient of L. In general, the conclusions of this paper are robust to some extent.

Table 5. Robustness test

	(1) Consume	(2) RI	(3) Consume	(4) EI	(5) Consume	(6) Loan	(7) Consume
L.	0.781*** (0.042)	0.781*** (0.033)	0.542*** (0.063)	0.672*** (7.251)	0.750*** (17.916)	1.434*** (0.119)	0.481*** (0.074)
RI			0.306*** (0.069)				
EI					0.047** (2.819)		
Loan							0.209*** (0.042)
Income	-0.318*** (0.060)	-0.462*** (0.074)	-0.176* (0.071)	-0.474** (-2.751)	-0.295*** (-4.807)	-0.638*** (0.116)	-0.184** (0.063)
Ur	0.001** (0.001)	0.001 (0.001)	0.001* (0.000)	0.002 (1.674)	0.001* (2.549)	0.001 (0.001)	0.001* (0.000)
Fiscal	-0.000 (0.001)	-0.001 (0.001)	-0.000 (0.001)	0.001 (0.295)	-0.000 (-0.645)	-0.004** (0.001)	0.000 (0.001)
Unemp	-0.006 (0.005)	-0.001 (0.004)	-0.006 (0.005)	-0.021 (-1.467)	-0.005 (-1.051)	-0.003 (0.009)	-0.006 (0.005)
Eco	0.027* (0.014)	0.017 (0.013)	0.022* (0.010)	0.032 (1.655)	0.026 (1.959)	0.035 (0.024)	0.020* (0.010)
Gov	0.017 (0.022)	0.041* (0.016)	0.004 (0.021)	-0.038 (-0.929)	0.018 (0.830)	0.189 (0.121)	-0.023 (0.030)
Road	-0.012 (0.011)	0.012 (0.009)	-0.015 (0.010)	-0.029 (-1.213)	-0.011 (-0.981)	0.002 (0.015)	-0.012 (0.010)
Open	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000 (1.078)	0.000*** (18.647)	0.000*** (0.000)	0.000*** (0.000)
Indus	0.002* (0.001)	0.002*** (0.001)	0.001 (0.001)	0.002 (0.661)	0.002* (2.342)	0.000 (0.001)	0.002* (0.001)
cons	5.868*** (0.365)	6.380*** (0.345)	3.917*** (0.593)	1.750 (1.932)	5.786*** (15.881)	-0.105 (0.633)	5.890*** (0.332)
N	672.000	672.000	672.000	672.000	672.000	672.000	672.000
R ²	0.875	0.907	0.886	0.556	0.877	0.934	0.885

5. Conclusions and Policy Recommendations

This paper studies the impact of digital inclusive finance on household consumption in 11 provinces and cities along the Yangtze River Economic Belt from 2016 to 2022 by establishing a regression model. Conclusions are drawn as follows: first, digital inclusive finance promotes the improvement of residents' consumption level, and the results are robust; Secondly, the results of mechanism analysis show that digital inclusive finance can improve the level of household consumption by increasing residents' income, digital insurance and consumer credit. Thirdly, the heterogeneity analysis from the regional and urban-rural aspects shows that the promoting effect of digital inclusive finance on household consumption is more obvious in the middle reaches of the Yangtze River Economic Belt, and the role of digital inclusive finance in promoting the consumption of rural residents is more significant. According to the research conclusions, this paper puts forward the following four policy suggestions:

5.1. Improve policies and regulations related to digital inclusive finance

The government can introduce relevant policies to encourage financial institutions and technology companies to participate in the field of digital inclusive finance, so as to reduce the risks and costs of financial institutions. This may include providing tax incentives, loan guarantees, risk compensation and other incentives. In order to continuously improve the consumption power of residents and encourage them to participate in consumption more actively, it is necessary to vigorously strengthen the infrastructure construction of payment and clearing and other digital finance, and further expand the service scope of digital inclusive finance, so as to provide internal driving force for promoting sustainable and high-quality economic development. From the perspective of macro policy, digital inclusive finance is a global issue, which requires international cooperation and exchange. In order to promote global digital financial inclusion and further stimulate consumption and domestic demand, governments should take the initiative to participate in relevant affairs of international organizations to share experience and best practices; From the perspective of micro users, the government should strengthen the policies and regulations on data security and privacy protection to ensure that residents' personal information is not leaked when using digital inclusive finance products, so as to enhance residents' trust in and willingness to use digital inclusive finance. In particular, the capital investment in the field of Internet and mobile finance provides a solid backing for China's digital inclusive finance in the next stage.

5.2. Promote the progress of the digital insurance industry

As a core business in the development of digital inclusive finance, digital insurance has played a key role in reducing income instability and diversifying household financial risks. At present, the consumption structure of Chinese residents is undergoing profound changes. Based on the precautionary saving theory, people hold great uncertainty about future income and expenditure due to inadequate education, health

and social security systems. This expectation causes the marginal benefit of consumption for those consumers with a risk-averse attitude to exceed the marginal benefit under certainty. As risk rises, so does the marginal benefit of consumption, which may lead residents to reduce short-term consumption and thus increase the need for precautionary savings. Therefore, in order to meet the needs of residents in the financial sector, it is necessary to explore financial service products, develop the wealth management market, enrich the ways of investment and wealth management, and cultivate the concept of value investment and long-term investment. Under the guidance of government policies, many insurance companies have made fruitful attempts and practical operations. At present, the insurance industry is considering digital transformation as its key development strategy, and digital transformation has become a new trend of innovative development in the insurance industry, in order to reduce the willingness of precautionary savings, promote the transformation of household savings to investment, and increase the level of household consumption.

5.3. Promoting fintech innovation

Governments can support fintech research and development and encourage financial institutions and tech companies to innovate. This includes supporting the application of blockchain, artificial intelligence, big data and other technologies in the financial sector to improve the efficiency and security of financial services. In the process of carrying out digital inclusive finance business, financial institutions should pay special attention to the vertical expansion of business. For customers with a certain scale, financial institutions can promote their adoption of digital services from multiple perspectives. Based on the service information provided, financial institutions can offer preferential measures in financing, lending, payment and transfer to companies and individuals who often rely on digital inclusive financial services. Through preferential measures provided by financial institutions, users have gradually formed habits while gaining benefits from digital inclusive financial services. This practice can enhance users' awareness and intention of use, and further stimulate their consumption intention. In addition, by optimizing the digital banking system, financial institutions can provide consumers with diversified and personalized services and increase the types and availability of consumer credit, thus expanding the market size and driving economic growth.

5.4. Differentiated development of digital inclusive finance

In view of the uneven regional and urban-rural development of digital inclusive finance, corresponding measures need to be taken to better meet the needs of different groups, improve the availability and satisfaction of financial services, and promote inclusive economic growth. For the heterogeneity of development in different regions of the Yangtze River Economic Belt, the government should consider increasing special financial support to comprehensively improve the penetration rate and service quality of digital inclusive finance, and promote the virtuous cycle of fintech innovation and inclusive finance development. The government and financial institutions should also strengthen financial education, increase publicity, and enhance consumers' understanding and ability to use

financial products and services. In view of the uneven development of urban and rural areas in the Yangtze River Economic Belt, it is necessary to adjust the supply mode of digital inclusive finance and make full use of its positive role in improving the consumption of rural residents. In addition, in order to solve the unbalanced development problem of digital inclusive finance, the government should also regularly evaluate the development effect of digital inclusive finance, and constantly adjust and optimize the development strategy according to market changes and customer needs, so as to ensure that more residents benefit from the progress of finance and technology, and further improve the consumption level of residents.

Acknowledgment

Jiangnan University University-level Scientific Research Project Funding Program (2023XZD02)

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