Research on the Influence of Digital Inclusive Finance Development on the Resident Consumption Level

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Abstract—The rapid development of digital inclusive finance has provided effective financial services for a wider range of residents, and has driven the improvement of household consumption through more convenient payment methods, easier access to credit methods, and wider investment and financial management methods. This paper uses the panel data of 31 provinces and cities in China from 2014 to 2019, and uses the digital inclusive finance index of Peking University to analyze the influence mechanism of digital inclusive finance on residents' consumption level from the perspectives of credit use, investment use and intermediary effect. Through empirical research found that: digital financial inclusion index, using depth index, credit index, investment index growth has played a positive effect on consumption, among them, for the lag of the investment index research found that residents' consumption level is also affected by investment redemption, at the same time, the study also found that digital inclusion financial development influence on consumption of urban and rural heterogeneity. To study the intermediary influence of the digital inclusive financial investment business index, it is found that the investment business index plays an intermediary role in the influence of the credit business index on the household consumption level affected by the ratchet effect of the previous period. Finally, the paper puts forward the countermeasures and suggestions from how to promote the residents' consumption level and how to promote the residents to establish a healthy consumption concept.

Keywords— Digital Inclusive Finance; Household consumption; Intermediary effect; Bidirectional fixed effect model.

I. INTRODUCTION AND LITERATURE REVIEW

Under the background of the development of the Internet popularization, the universe, block chain, digital currency and other emerging topics about the Internet and financial economy is built and even created, digital is gradually integrated into the life, the rapid development of digital financial, financial services also with the help of the Internet makes users in a wider environment and conditions to improve the availability. At the same time, the development of digital finance has also promoted the development of inclusive finance, which not only reduces the cost of the development of inclusive finance, but also improves the availability of inclusive finance. The development of digital inclusive finance promotes the overall economic development by providing small and micro financial services such as enterprises and low-income groups, which can play a powerful role in the development of the real economy and poverty alleviation. Some scholars' research also shows that digital inclusion financial also helps to promote consumption, consumption is one of the economic carriage, the outbreak under the impact of consumption how to better promote the consumption of the carriage is very important, so digital inclusion financial how to promote consumption has become a lot of scholars research problem, to find the mechanism helps to better plan the development direction of digital inclusion financial. Therefore, this paper studies the influence of digital inclusive finance on residents' consumption power, which helps to enrich the mechanism path of its influence.

Foreign scholars on the influencing factors of household consumption, Sabokkhiz Leila et al. (2021)[1]for the lowest income, through the analysis of 1981-2019 Canadian high-income provinces and provinces data, through development,

the lowest income for high-income and low-income provinces consumption is positive, and in the short term, the lowest income consumption is negative and for low-income provinces is not significant. The Habanabakize Thomas (2021) [2] used the 2002-2020 quarterly data to examine the relationship between South African household consumer spending and oil prices, exchange rate fluctuations, and disposable income. Kirdruang Phatta et al. (2018)[3] conducted a study on the impact of the Thai UHC program on household consumption and savings, showing that the program had little impact on household consumption and savings in the short term, while it worked on promoting consumption in the long term but still had no impact on savings. Jaikumar Saravana et al. (2021) [4]analyzed the data from Indian families and found that diseases such as diabetes can increase medical and non-medical expenses in high-income families, while the increase in medical expenses in low-income families can only be transferred from non-medical expenses.

Domestic scholars have discussed how the mechanism of digital inclusive finance affects residents' consumption. Caimei Lu et al. (2021) [5]studied the data of 280 prefecture-level cities, and concluded that digital finance is conducive to the growth of residents 'consumption, while the income gap is not conducive to the growth of residents' consumption. The development of digital finance will reduce the income gap and thus promote residents 'consumption, mediated by the income gap. According to the research, the income gap plays a partial intermediary role in the impact of digital finance on residents' consumption. Also is the income gap as an intermediary factor, XiaoYun (2021) [6]and others on digital inclusion financial development factor and urban-rural income gap, and the relationship between consumption gap between urban and

rural residents, the study found that digital inclusion financial to narrow the consumption gap between urban and rural residents, and the urban and rural residents income gap is not conducive to narrowing urban and rural residents consumption gap intermediary factors, two factors with opposite effect of offset, In the low-level group, there will be the development of digital inclusive finance, which is not conducive to narrowing the consumption gap between urban and rural residents. Also, for the factor of income, Mingyang Wang (2021)[7] also from the perspective of income stratification, analyzes the different income levels of group consumption affected by digital inclusion financial, research shows that the development of digital inclusion financial impetus for different income groups, but the promotion of low-income groups is not very significant. Yuanfei Xiao et al (2020)[8] analyzed that digital financial finance can promote consumption level of rural residents in terms of consumption level effect; in consumption structure effect, digital financial finance helps urban and rural residents to improve consumption level; and the liquidity constraints of rural residents can also be alleviated by digital financial finance. For the digital inclusion financial and promote the relationship between the consumption level and there are a lot of scholars launched research, Jianjun Yan (2021) [9] and others found that digital inclusion financial can promote urban and rural residents consumption upgrade, but found in the heterogeneity test in different regions are different, and through research also found that digital inclusion financial can promote the third industry through the intermediary factor to promote rural residents consumption. Yong Tang et al. (2021) [10] found that digital inclusive finance has a promoting effect on the consumption upgrading of rural residents. All dimensions (breadth, depth and digital degree) can promote the consumption upgrading of rural residents, and the study also confirmed that the income level of rural residents is one of the intermediary factors. Xiaoxia Chen (2020) [11]research believes that digital inclusive finance can promote residents' income and promote consumption upgrading.

II. RESEARCH HYPOTHESIS

This paper is a research on digital inclusive finance in the order from total to score, mainly divided into three layers. The first layer studies the digital financial inclusion general index, the second layer studies the digital inclusive finance use depth index under the general index, and the third layer studies the credit use and investment use indicators subordinate to the depth index. The following four hypotheses are presented here.

A. From the total index and the use of the depth index

Digital financial inclusion index includes three aspects: coverage breadth index, use depth index and digital degree index. Generally speaking, the development of digital financial services provides more efficient financial services, which promotes the increase of per capita consumption expenditure from multiple paths; and the use depth includes many more detailed indicators, which represents the use of digital financial inclusion and effectively promotes the consumption expenditure of residents. The following assumptions are therefore made:

Hypothesis 1: Both the total index and the depth index of digital inclusive finance will have a positive impact on residents' consumption level.

B. From the credit business and investment business index

Digital inclusion financial development makes financial services long tail market get more effective coverage, make originally cannot access to financial services and liquidity constraints consumers can through digital inclusion financial credit smooth consumption smooth to promote consumption, and due to the relative income hypothesis "ratchet effect" and "demonstration effect" will drive a wider range of people continue to rise consumption. Thus, the following assumptions are made:

Hypothesis 2: The credit business of digital inclusive finance has a positive impact on residents' consumption level.

Investment by consumer business tend to improve consumers' expectations of future income, especially when consumers profit from the investment business due to self-attribution bias will make consumer subject to further enhance future income expectations, by lasting income hypothesis will make the consumer subject to improve the current consumption level, and by the psychological account theory, investment gains tend to consume faster. According to relevant reports, the average period of Alipay platform fund investors to hold funds is 337 days, nearly one year, investors settle the final income at this time, at this time, investors get an investment income, which may promote the current consumption. Thus, the following assumptions are made:

Hypothesis 3: Both the current and lagging digital inclusive finance investment will have a positive impact on residents' consumption level.

C. From the perspective of the intermediary mechanism

First of all, the consumer subject due to the digital inclusive finance development and easier to get credit, thus reduces the consumer subject due to uncertainty about the future income and increase the preventive savings, reduce the part of the savings will flow to consumption, investment, etc., and due to the credit time, amount of mismatch, lenders in order to reduce the cost of capital will be idle amount to short-term investment finance, it will further promote the investment business. Secondly, as mentioned by Hypothesis 3, the increase of investment business may promote residents' consumption. This paper makes the following assumptions:

Hypothesis 4: The investment business of digital inclusive finance has an intermediary effect in the impact of digital inclusive financial credit business on residents' consumption level.
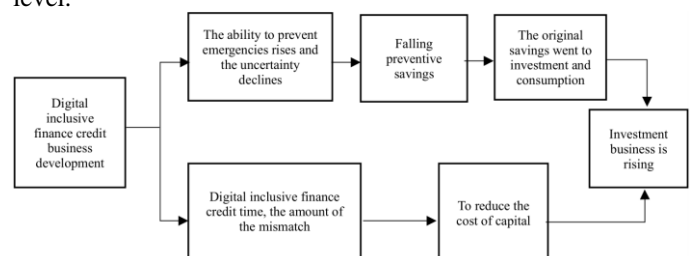

Fig. 1. The transmission path of the credit to the investment business

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III. RESEARCH DESIGN

A. Variable selection

Explained Variable: Consume, the per capita consumption expenditure of residents as the explanatory variable of this paper is used to study the impact of digital inclusive finance on household consumption expenditure. The China Statistical Yearbook compiled by the National Bureau of Statistics defines resident consumption expenditure as the total expenditure used by residents to meet the daily living consumption needs of their families.

Interpret Variables: The influence of digital inclusive finance on residents 'consumption is studied in the order of total to score, and the influence mechanism of this paper is the influence of the credit business of digital inclusive finance and the investment business on residents' consumption and its intermediary effect. So the explanatory variable adopted in this paper is the three levels of digital inclusion financial index of Beijing university, take the form of total to points, respectively is the digital inclusion financial index (DIGI1), followed by the total index subordinate depth index (DIGI2), again is the depth index subordinate credit business (Credit), investment business (Invest) indicators.

TABLE 1. The Index System of Credit Business and Investment Business

Credit operations	Personal consumption loan	The number of Internet consumer loans is available per 10,000 adult Alipay users
		Per capita loan number
		Per capita loan amount
	Small and micro operators	The number of users per 10,000 adult users of Internet small and micro business loans
		The average number of loans for small and micro business operators
		Average loan amount of small and micro business operators
Investment portfolio		The number of people among Alipay users who participate in Internet investment and financing is every per 10,000 people
		Per capita investment
		Per capita investment amount

Controlled Variable: Household per capita disposable income (PCDI) is greatly affected by absolute income hypothesis; tertiary industry in GDP (GDPRATE) mainly represents service industry or business, including wholesale and retail, accommodation, catering, entertainment and other industries closely related to household consumption; children (TD) and elderly population (OD) can plan consumption at all stages according to the life cycle hypothesis. The dependency ratio of the non-working-age population represents the dependency burden of the working-age population, which is also an important factor for the working-age population to consider for the smooth consumption.

B. Model building

The benchmark model of this paper conducts regression analysis on the general index of digital inclusive finance, the use depth index, credit under the use depth index, and investment business index respectively according to the research order from total to score. A two-way fixed-effects model was also adopted to remove the missing variables that

do not change with time, but vary with the individuals, and those that do not vary with the individual but change with time. The following models were constructed, respectively

$$Consume_{i,t} = \alpha_0 + \alpha_1 Consume_{i,t-1} + \alpha_2 DIGI1_{i,t} + \alpha_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (1)$$

$$Consume_{i,t} = \beta_0 + \beta_1 Consume_{i,t-1} + \beta_2 DIGI2_{i,t} + \beta_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (2)$$

$$Consume_{i,t} = \gamma_0 + \gamma_1 Consume_{i,t-1} + \gamma_2 Credit_{i,t} + \gamma_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (3)$$

$$Consume_{i,t} = \eta_0 + \eta_1 Consume_{i,t-1} + \eta_2 Invest_{i,t} + \eta_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (4)$$

$$Consume_{i,t} = \phi_0 + \phi_1 Consume_{i,t-1} + \phi_2 Invest_{i,t-1} + \phi_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (5)$$

Where, i represents the province studied, t represents the year studied (2014-2019), and $\lambda_t + \mu_i + \varepsilon_{i,t}$ is added as a composite disturbance term. Consume for regional residents per capita consumption expenditure, because consumption spending has a ratchet effect, the previous consumption spending will affect the current consumption spending, so this article joined the $Consume_{i,t-1}$ of lag regional residents per capita consumption spending to consider this effect. DIGI2 is the depth indicator of the use of digital financial inclusion. The Credit is an indicator of credit business in Peking University's Digital Financial Inclusion Index. $Invest_{i,t-1}$ is an indicator of investment business in the Peking University digital Financial inclusion Index. $Controls_{i,t}$ as the control variable, respectively for PCDI for residents per capita disposable income, GDPRATE for the tertiary industry accounted for GDP, TD for child dependency ratio, OD for the elderly dependency ratio.

C. Data specification

In this paper, the indicators in Peking University Digital Inclusive Finance Index (Phase III) are selected as the main explanatory variable. Since the investment business indicators were counted from 2014, the sample selected in this paper is selected as the panel data of 31 provinces and cities in China from 2014 to 2019. The rest of the variables are obtained from the National Bureau of Statistics and the Guotaian database. The data in percentage units selected in this paper are all calculated by every 100, and the descriptive statistical analysis of the main variables is shown in Table 2.

TABLE 2. Descriptive analysis

Variables	Definition Variables	Mean	S.D.	Min	Max
Consume	Per capita consumption expenditure	17927	7052	7317	45605
DIGI1	Digital Financial inclusion General Index	254.3	55.70	143.9	410.3
DIGI2	Digital Financial inclusion depth Index	239.5	72.56	107.3	439.9
Credit	Credit Use Index	154.3	48.67	21.11	282.2
Invest	Investment and use index	193.6	102.8	9.200	480.1
PCDI	per capita disposable income	25089	10816	10730	69442
GDPRATE	Share of the tertiary industry in GDP	49.29	8.646	35.39	83.50
TD	Child dependency ratio	23.14	6.383	12	38.38
OD	The dependency ratio of the elderly population	14.74	3.427	7.010	23.82

IV. EMPIRICAL ANALYSIS

A. Benchmark regression analysis

First, we expand the analysis of the five explanatory variables in this paper. In the benchmark regression analysis, this paper regression the digital financial inclusion general index (DIGI1), depth index (DIGI2), credit business index (Credit), investment business index (Invest), lagging investment business index (L.Invest) and average consumption expenditure (Consume). In the regression analysis of these five participants, the variable of lagging consumption expenditure used to observe the temporal impact of consumption is all less than 0.01, and the coefficient is around 0.6. It can be seen that the consumption expenditure does have a ratchet effect, and the consumption expenditure of the previous period has a positive impact on the current consumption expenditure. It can be observed that the five explanatory variables to be studied are all significant, and the corresponding coefficient is not only positive but also presents the total index coefficient, use depth index coefficient, credit business index coefficient and investment business index coefficient shows a decreasing relationship, which also correspond to the inclusion relationship of these indicators, and indirectly shows the robustness of the studied relationship. The coefficients of the explanatory variables are all positive, which can verify the hypotheses 1,2 and 3 of this paper.

TABLE 3. The impact of digital financial inclusion related indicators on household consumption

	(1) Consume	(2) Consume	(3) Consume	(4) Consume	(5) Consume
L. Consume	0.562***	0.561***	0.614***	0.554***	0.585***
	(0.093)	(0.106)	(0.118)	(0.098)	(0.110)
DIGI1	21.017***				
	(6.770)				
DIGI2		13.322***			
		(4.609)			
Credit			8.631*		
			(5.029)		
Invest				7.280***	
				(2.377)	
L.Invest					5.594**
					(2.467)
PCDI	0.151***	0.152**	0.190***	0.146**	0.162***
	(0.051)	(0.058)	(0.056)	(0.057)	(0.059)
GDPRATE	21.063	14.684	20.569	21.358	16.371
	(14.774)	(13.568)	(15.875)	(15.177)	(15.758)
TD	14.208	25.592	10.351	6.561	2.996
	(25.900)	(30.557)	(28.550)	(29.953)	(27.130)
OD	-43.143	-41.755	-36.778	-6.237	-24.102
	(28.428)	(30.412)	(30.305)	(30.990)	(30.927)
Year	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
_Cons	-1030.324	1302.322	862.537	2376.671**	2994.139***
	(1626.362)	(1099.995)	(1388.191)	(924.265)	(956.415)
N	155	155	155	155	155
R^2	0.985	0.985	0.984	0.985	0.984

Note: * * *, * *, * means that the estimates are significant at 1%, 5%, and 10%, respectively, the same below.

Then analyze the control variables. Resident per capita disposable income (PCDI) is both positive and significant in the regression, which can be explained according to the theory of absolute income, that is, income plays a great role in consumption expenditure. It can be seen that this control variable is an important control variable affecting resident per capita consumption expenditure. The third industry accounted

for GDP proportion (GDPRATE) is not significant, but it can be observed to the per capita consumption spending played a positive impact, the third industry mainly refers to the service industry or business, the proportion of GDP to a certain extent can reflect the development of the financial sector, the development of the financial industry promotes the inter-term consumption tools such as credit, will have a positive impact on residents' consumer spending. Although the child dependency ratio (TD) and the elderly population dependency ratio (OD) are not significant, But as it can be seen that, The child dependency ratio plays a positive role on the per capita consumption expenditure of residents, The dependency ratio of the elderly population plays a negative role on the per capita consumption expenditure, Firstly, the possible reason is that, with the development of digital finance, Teenagers are more receptive to tools such as online payments, Online purchases reduce the availability of online consumption for teenagers, The elderly population is weak to accept these emerging payment methods, On the other hand, the consumer products for young people are constantly being upgraded, Parents are also willing to buy for them, leading to a positive impact on the child dependency ratio and consumption.

B. Analysis of urban-rural heterogeneity

Table 4 and table 5, respectively for digital inclusive finance impact on urban residents and rural residents consumption empirical research, to study the timing of consumption of the corresponding lag period per capita consumption spending variables are significantly positive, urban and rural residents consumption spending ratchet effect, and urban lag period per capita consumption spending coefficient is below 0.4 and rural lag period per capita consumption spending coefficient is around 0.8, visible rural consumption spending ratchet effect is more obvious.

TABLE 4. The impact of digital financial inclusion related indicators on urban residents' consumption

	(1) Ccons	(2) Ccons	(3) Ccons	(4) Ccons	(5) Ccons
L.Ccons	0.375**	0.372**	0.377**	0.333*	0.366**
	(0.171)	(0.163)	(0.164)	(0.166)	(0.169)
DIGI1	20.735				
	(13.820)				
DIGI2		17.590			
		(11.419)			
Credit			22.066*		
			(11.331)		
Invest				10.716	
				(6.608)	
L.Invest					8.125
					(7.325)
Controls	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
_Cons	3943.793	5851.371	3723.201	7629.307	8367.124*
	(5663.442)	(5104.028)	(5186.022)	(4635.361)	(4297.193)
N	155	155	155	155	155
R^2	0.880	0.881	0.882	0.881	0.880

For the study of explanatory variables: digital inclusive finance total index, use depth index, credit index, investment index, lag the phase of investment index, the regression of rural results is more significant, but compared to table 3, table

5 for rural residents consumption research explanatory variable coefficient is small, namely digital inclusive finance impact on rural residents consumption expenditure although significant but relatively small. Possible reason is that the development of digital inclusive finance can effectively overcome the problem of traditional financial, make the rural long tail market more effectively obtained financial services, and rural digital inclusive financial audience proportion relatively more cities, makes the development of digital inclusive finance can significantly promote rural residents consumption, but because rural consumption spending level than urban residents and the consumption spending ratchet effect is more obvious, digital inclusive finance influence on rural residents consumption degree is relatively small.

TABLE 5. The impact of digital financial inclusion related indicators on rural residents' consumption

	(1) Tcons	(2) Tcons	(3) Tcons	(4) Tcons	(5) Tcons
L.Tcons	0.789***	0.819***	0.882***	0.823***	0.844***
	(0.073)	(0.071)	(0.065)	(0.067)	(0.071)
DIGI1	19.508***				
	(4.773)				
DIGI2		10.793***			
		(2.949)			
Credit			7.823**		
			(3.776)		
Invest				6.085***	
				(1.814)	
L.Invest					3.897**
Controls	YES	YES	YES	YES	（1.449）
					YES
Year	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
_Cons	2995.262**	-792.775	-1324.111	28.254	516.047
	(1350.239)	(896.823)	(1204.341)	(799.187)	(824.655)
N	155	155	155	155	155
R^2	0.982	0.981	0.979	0.981	0.979

TABLE 6. Robustness test 1

	(1) Consume	(2) Consume	(3) Consume	(4) Consume	(5) Consume
L.Consume	0.367***	0.395***	0.434***	0.357***	0.413***
	(0.131)	(0.134)	(0.145)	(0.119)	(0.145)
DIGI1	31.544***				
	(10.456)				
DIGI2		16.473***			
		(5.687)			
Credit			19.855**		
			(8.523)		
Invest				12.454***	
				(3.267)	
L.Invest					5.558*
					(3.229)
Controls	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
_Cons	-54.217	2982.076**	1961.310	5533.270***	3895.399***
	(2094.291)	(1427.972)	(1743.261)	(1051.693)	(1276.732)
N	124.000	124.000	124.000	124.000	124.000
R^2	0.981	0.980	0.979	0.981	0.978

C. Robustness test

As one of the core explanatory variables of this paper digital pratt & Whitney finance investment business index in Peking University digital pratt & Whitney finance index in 2014, may be due to digital inclusive finance investment business in development, many provinces in 2014-2015

investment business index developed rapidly, so in order to reduce the impact of the results, this paper selects the sample period method, remove the data from 2014, regression analyze the panel data from 2015 to 2019. According to Table 6, all the variables of per capita consumption expenditure that lag behind the first period are significantly positive, which verifies the ratchet effect of consumption, which is consistent with the above. Regression results of the five explanatory variables: digital inclusive finance total index, using depth index, credit business index, investment business index, lag a phase of investment business index are significantly positive, shows that the digital pratt & whitney financial the five indicators are positively related to residents per capita consumption expenditure, the conclusion is consistent with the above, by the robustness test know the above research conclusion is robust.

TABLE 7. Robustness Test 2 (Impact on Cities)

	(1) Ccons	(2) Ccons	(3) Ccons	(4) Ccons	(5) Ccons
L.Ccons	0.171	0.175	0.162	0.124	0.131
	(0.230)	(0.214)	(0.235)	(0.208)	(0.233)
DIGI1	10.152				
	(22.571)				
DIGI2		7.614			
		(17.967)			
Credit			24.306		
			(22.056)		
Invest				11.500	
				(10.728)	
L.Invest					8.088
					(9.474)
Controls	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
_cons	7789.587	8626.577	6976.758	10908.419**	9557.141*
	(6835.426)	(5747.606)	(6195.379)	(4850.760)	(5194.933)
N	124.000	124.000	124.000	124.000	124.000
R^2	0.851	0.852	0.854	0.855	0.853

TABLE 8. Robustness Test 3 (Impact on Rural Areas)

	(1) Tcons	(2) Tcons	(3) Tcons	(4) Tcons	(5) Tcons
L.Tcons	0.724***	0.759***	0.800***	0.723***	0.774***
	(0.091)	(0.087)	(0.082)	(0.086)	(0.080)
DIGI1	25.888***				
	(7.068)				
DIGI2		11.730**			
		(4.451)			
Credit			13.472**		
			(5.111)		
Invest				8.341***	
				(2.193)	
L.Invest					5.586***
					(1.877)
Controls	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
_Cons	3723.909**	-1157.098	-1864.748	629.780	-521.927
	(1739.962)	(1311.955)	(1472.037)	(1408.576)	(1301.373)
N	124.000	124.000	124.000	124.000	124.000
R^2	0.973	0.971	0.970	0.972	0.970

As shown in Table 7 and Table 8, the urban financial inclusion research index is still insignificant, but the coefficient is positive, indicating that the development of digital financial inclusion also has a positive impact on urban

residents' consumption. For the regression results of rural areas, the per capita consumption expenditure variable and the research index of digital financial inclusion are significantly positive, reflecting the ratchet effect and the growth of digital financial consumption expenditure can significantly promote the consumption expenditure of rural residents, which is consistent with the above research conclusion, and the conclusion is robust.

V. FURTHER RESEARCH

A. Mediator-effect model construction

The analysis shows that digital financial investment business is the intermediary factor for the impact of digital financial credit business on the level of household consumption expenditure. Build similar models as shown in the baseline analysis section of this article.

$$Consume_{i,t} = \gamma_0 + \gamma_1 Consume_{i,t-1} + \gamma_2 Credit_{i,t} + \gamma_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (6)$$

$$Invest_{i,t} = \rho_0 + \rho_1 Credit_{i,t} + \rho_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (7)$$

$$Consume_{i,t} = \varphi_0 + \varphi_1 Consume_{i,t-1} + \varphi_2 Credit_{i,t} + \varphi_3 Invest_{i,t} \\ + \varphi_4 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (8)$$

In order to reduce the influence of the three formulas on the mediation effect study because of the different variables $Consume_{i,t-1}$, the following treatment is made: and the formula containing $Consume_{i,t-1}$ is moved to the left side of the formula, and $Consume_{i,t} - \gamma_1 Consume_{i,t-1}$ is defined as the consumption expenditure that removes the influence of the ratchet effect in the previous phase, recorded as $C'_{i,t}$. Because (6) and (8) are to study the same period of credit business on residents per capita consumption expenditure, only (8) considered the intermediary influence, so the theory of the two types of x should be the same, and the coefficient is only 0.058, so this paper will (6) and (7) $C'_{i,t}$ as the same, this paper will be the study of credit, investment, current consumption spending into study the intermediary relationship between credit, investment, remove the previous ratchet effect of consumer spending. Therefore, in order to study the intermediary influence of digital inclusive finance investment business, this paper refers to the intermediary research method of Wen Zhonglin et al. (2004)[12], and establishes the following three models:

$$C'_{i,t} = \gamma_0 + \gamma_1 Credit_{i,t} + \gamma_2 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (9)$$

$$Invest_{i,t} = \rho_0 + \rho_1 Credit_{i,t} + \rho_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (10)$$

$$C'_{i,t} = \varphi_0 + \varphi_1 Credit_{i,t} + \varphi_2 Invest_{i,t} + \varphi_3 Controls_{i,t} + \lambda_t + \mu_i + \varepsilon_{i,t} \quad (11)$$

B. The result of the intermediary mechanism of digital inclusive financial credit business on the level of consumer expenditure

According to the intermediary effect test method of Wen Zhonglin et al. (2004)[12], Regression Results The regression coefficient of Index in Table 9 (1) is 8.631 and significant, It shows that the development of credit business has a positive impact on the consumption expenditure of excluding the previous ratchet effect, The results also passed the first step of the mediation effect test (Table 6 explains significant variables); Regression Results The regression coefficient of

the digital credit inclusion index in column (2), Table 9, is 0.476 and significant, It can be seen that the development of digital financial finance credit business will promote the investment business of digital financial finance, It is also observed that the digital financial inclusion investment business index in Table 9 (3) is significantly positive, These two results also passed the second step of the mediation effect test (Table 7 showed significant coefficients of the explanatory variables and those of the mediation variables of Table 8). Through these two-step tests, it can be seen that the digital financial inclusion investment indicators does have an intermediary effect in the impact of the digital financial inclusion credit business on the consumption expenditure excluding the ratchet effect of the previous period. Moreover, the digital inclusive financial credit business index in column (3) of Table 9 is not significant and is a complete intermediary effect (thus, hypothesis 4 is true).

TABLE 9. Results of the mediation effect

	(1)	(2)	(3)
	Consume	Invest	Consume
L.Consume	0.614***		0.556***
	(0.118)		(0.098)
Credit	8.631*	0.476**	5.492
	(5.029)	(0.188)	(4.721)
Invest			6.534***
			(2.185)
Controls	YES	YES	YES
Year	YES	YES	YES
Province	YES	YES	YES
_Cons	862.537	134.635***	1453.366
	(1388.191)	(43.958)	(1254.707)
N	155.000	186.000	155.000
R²	0.984	0.985	0.985

VI. CONCLUSIONS AND POLICY RECOMMENDATIONS

This paper studies the influence of digital inclusive financial services on the consumption level, mainly in the order of total to points, first study the influence of digital inclusive financial index on consumer consumption, then, one of the digital inclusive financial indicators using depth index, again on the use of depth indicators subordinate credit indicators and investment indicators, at the same time, the two indicators of the intermediary path of digital inclusive financial affecting consumption mechanism, also to explore the influence of digital inclusive financial services on urban and rural residents consumption differences. This paper uses short panel data and uses a two-way fixed-effect model. Through the study of this paper, the following conclusions are drawn:

First, The digital financial inclusion index and the depth index of digital financial inclusion have a positive impact on the level of consumer expenditure. According to regression analysis, it is known to see that for each unit of digital inclusion index rises, the per capita consumption expenditure of residents by region will rise by 21.017 yuan; for each unit of digital inclusion depth index rises, the per capita consumption expenditure of residents by region will rise by 13.322 yuan.

Furthermore, Digital inclusive finance credit business will have a positive impact on household consumer expenditure. According to the empirical analysis results, for each unit

increase in the digital financial inclusion credit consumption index, the per capita consumption expenditure by regions will rise by 8.631 yuan.

Second, The current investment use index of digital inclusive finance and the lagging first-phase investment use index have a positive impact on the regional household consumption expenditure. According to the empirical analysis results, each unit increase of the current and lagging phase of investment use index will increase the per capita consumption expenditure by 7.28 yuan and 5.594 yuan respectively. It can be seen that although both will have a positive impact on residents 'consumption, the current investment has a greater impact on residents' consumption expenditure compared with the investment lagging behind one period.

In addition, The development of digital inclusive finance has a more significant impact on rural residents' consumption expenditure than that in cities, and the consumption expenditure of rural residents has a stronger ratchet effect. In the benchmark regression study and robustness test, the coefficient of rural residents 'lagging consumption expenditure variable was relatively large and significant. Secondly, the number of financial inclusion index had a positive and significant influence on rural residents' consumption expenditure, while the coefficient of urban residents was positive but not significant.

Finally, the current investment business of digital inclusive finance plays an intermediary role in the influence of the use of digital inclusive finance credit on residential consumer expenditure. By gradually verifying the intermediary impact of the digital financial inclusion investment use index, and it is a complete intermediary effect.

Our results have important policy implications. By promoting the development of digital inclusive finance towards more diversified and more personalized investment methods, safer financial services, and more innovative financial products, it will drive the growth of household consumption. While digital inclusive finance promotes residents' consumption, it should also guide the growth of household consumption expenditure to develop simply. Digital inclusive financial credit, especially consumer credit, should develop towards a more practical direction and promote the overall living standard of residents, and reduce the provision of consumer credit for high-level consumer products. Promoting the integration of online and offline financial services to establish a foundation for inclusive finance to promote household consumption. Although the coverage of digital inclusive finance shows a rising trend, there are still some blind spots, such as the elderly and those who are not skilled in relevant operations. One way to cover these blind spots is the combination of online and offline.

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