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Research on the Impact of Digital Inclusive Finance on the Development of the Real Economy

-- Based on Panel Quantile Model Analysis

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Abstract

Based on the panel data of 31 provinces, autonomous regions and municipalities across the country from 2011 to 2018, the fixed effect model is used to test the direct impact of digital financial inclusion on the development of my country's real economy, and panel quantile regression and instrumental variable regression are used to analyze it. Robustness test, using the mediation effect model to test whether digital financial inclusion can indirectly affect the real economy by affecting consumption. Digital financial inclusion can significantly promote the development of my country's real economy. From the perspective of three dimensions of digital inclusive finance, the breadth of coverage and the depth of use can promote the development of the real economy; digital inclusive finance can promote the development of the real economy by affecting the consumption mechanism.

Keywords

Digital Financial Inclusion; Real Economy; Fixed Effect; Panel Quantile Regression; Mediation Effect.

1. Introduction

The real economy is the lifeblood of my country's economic development. Maintaining the stability and vitality of the real economy is the basic requirement to achieve high-quality economic development in my country. Therefore, the focus of economic development must be placed on the real economy. The development of the real economy must have sufficient financial support. Therefore, the purpose of finance is to serve the high-quality development of the real economy. At the same time, the development of finance rooted in the real economy is also a fundamental measure to avoid financial risks and maintain its own stable development. However, traditional finance has some limitations, resulting in financial resources failing to support the development of the real economy well. Inclusive finance is based on traditional finance, improves financial inclusion, reduces financing costs, and promotes the development of the real economy. With the development of technologies such as the Internet and big data, digital inclusive finance has emerged and flourished on the basis of the development of inclusive finance. The development of digital financial inclusion is still in its infancy, and there are few studies on its impact on the real economy. Therefore, this study studies the impact of digital financial inclusion on the development of the real economy from both theoretical and empirical aspects [1].

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2. Literature Review

Before the emergence of digital financial inclusion, my country first implemented the financial inclusion mechanism. By improving the penetration and efficiency of financial services, inclusive finance enables disadvantaged groups to enjoy the fruits of economic development, and allows the fruits of economic development to truly "fly into the homes of ordinary people". In addition, inclusive finance also plays an important role in balancing resource allocation, correcting financial market imbalances, and improving investment efficiency. Later, with the development of the Internet and big data, digital inclusive finance emerged on the basis of inclusive finance. At present, many literatures have carried out research on the impact of digital financial inclusion from various aspects[2].

A study on the impact of digital financial inclusion on the urban-rural income gap. Song Xiaoling (2017) used the Theil index to measure the income gap between urban and rural areas in my country, and found that digital financial inclusion can significantly reduce the income gap between urban and rural areas. Ge Heping (2018) proposed that digital inclusive finance plays an important role in promoting regional development by virtue of the application of digital technology, and also found that the development of digital inclusive finance is conducive to narrowing the urban-rural income gap. On the impact of digital financial inclusion on household consumption. Yi Xingjian et al. (2018) found based on the micro-evidence of Chinese households that the development of digital inclusive finance has significantly promoted the consumption of residents, and this promotion effect is most obvious in rural areas, central and western regions, and middle- and low-income families. Research on the impact of digital financial inclusion on economic growth and industrial structure. (2020) used panel data to find that the development of my country's digital finance can significantly promote my country's economic growth. Tang Wenjin et al. (2019) used the threshold model to study the panel data of 283 cities above the prefecture level in my country from 2011 to 2015 and found that the impact of digital inclusive finance on the industrial structure is nonlinear, and the development of digital inclusive finance has a certain threshold effect[3].

The above-mentioned literature discusses the relationship between inclusive finance (digital inclusive finance) and household consumption from a macro or micro level, laying the foundation for further research in this article. However, the existing problems are relatively obvious. Existing research mainly focuses on the empirical relationship between digital financial inclusion and household consumption, but lacks theoretical analysis, especially the lack of endogenous motivation for household consumption by the development of digital financial inclusion. The analysis of the mechanism, in fact, household consumption is only a manifestation of the expansion of domestic demand or an intermediate transmission factor, which is likely to be manifested in the form of an intermediary effect, and has an impact on the expansion of domestic demand. Therefore, the marginal contribution of this article is mainly manifested in the following aspects: First, based on the background of internal and external dual cycles, based on the expansion of internal demand, theoretically examine the endogenous dynamic mechanism of digital financial inclusion for the expansion of domestic demand; second, breakthroughs The traditional literature considers the limitation of using consumption as an internal loop variable, and examines the influence mechanism of the development of digital financial inclusion on the expansion of domestic demand from the dual perspectives of consumption and investment contained in the internal loop. The intermediary effect of the expansion; the third is to examine the regional heterogeneity of digital financial inclusion to the expansion of residents' domestic demand.

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3. Theoretical Mechanism

3.1. The Direct Impact of Digital Financial Inclusion on Real Economy

Compared with traditional finance, digital inclusive finance greatly reduces the threshold for financial services and improves the financing availability of funds in the real economy. First, digital inclusive finance breaks the geographical restrictions of traditional finance, allowing those remote areas that traditional financial institutions have not benefited to enjoy fast financial services, meeting their capital needs, and stimulating local entrepreneurial innovation and market vitality. Second, due to information asymmetry, small and micro enterprises have problems such as difficulty in financing and expensive financing in the process of loaning by traditional financial institutions. The emergence of digital inclusive finance has lowered the threshold of financial services, effectively solved the problems of difficult and expensive financing for small and medium-sized enterprises, and provided a new way for small and micro enterprises and private enterprises to obtain financing.

In summary, this study proposes the following hypotheses:

H1: Digital financial inclusion will promote the development of the real economy.

3.2. Indirect Impact of Digital Financial Inclusion on the Real Economy

With the development of my country's economy, the level and structure of consumption continue to improve. As one of the "troikas" driving economic growth, the contribution rate of consumption to GDP has increased from 55.4% in 2012 to 65.9% in 2018. my country is driving economic growth by continuously stimulating consumption and expanding domestic demand. The rapid development of digital inclusive finance has greatly reduced the transaction cost and time cost of people in the process of enjoying financial services, and promoted the increase of people's consumption expenditure. The second is to use digital means for payment, which not only facilitates residents' living consumption, promotes the increase in the possibility of random consumption, but also promotes the increase in the number of residents' consumption and the total social consumption increase, and contribute to the development of the real economy. Third, digital inclusive finance lowers the threshold of financial services for low-income groups, providing them with a convenient Internet loan platform and investment platform. The emergence of wealth management products such as Yu'ebao in Alipay and Wechat Tong in WeChat has dispersed the investment risks of residents and increased their investment income, thereby promoting the increase in consumption; the emergence of micro-loan products such as Ant Huabei and Jingdong Baitiao , providing loan lines for low-income groups and stimulating their potential consumption needs[4].

In summary, this study proposes the following hypotheses:

H2: Digital financial inclusion can promote the development of the real economy through the intermediary effect of consumption levels.

4. Establishment and Analysis of the Model

4.1. Variable Selection and Data Description

Reflecting government investment demand, the sum of the two is used to measure the expansion of domestic demand, and the logarithm is used in the empirical research. Independent variable selection of the development of digital financial inclusion: The most authoritative measure of the development of digital financial inclusion is the data calculated by the joint research group of Peking University Digital Finance Research Center and Ant Financial Group. The data is divided into two stages. From 2011 to 2015 and 2016 to 2018, based on the data for this period, this paper estimates the data for 2019 through linear fitting, and finally obtains the data for digital financial inclusion from 2011 to 2019. Mediating effect variable

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selection: Based on the product of the domestic demand expansion variable obtained by the aforementioned calculation and the digital financial inclusion variable, the logarithm is processed in the empirical research. Selection of relevant control variables: select the per capita disposable income of rural residents, the level of regional economic development (measured by GDP), the level of Internet informatization (the ratio of the number of mobile phone users to the total number of people in each province at the end of the year), and the level of industrial structure (the tertiary industry accounts for Ratio measurement) as a control variable that affects domestic demand. The above control variables all come from the local statistical yearbooks and EPS of each province over the years.Data platform. Per capita disposable income and regional economic development levels are processed in logarithm[5].

Based on the above model (1) and model (2), this paper selects the 2011-2019 provincial panel data of 30 provinces and municipalities in my country (excluding Tibet, Hong Kong, Macao and Taiwan) for estimation, using mixed regression, fixed effects and two-way fixed effects respectively Make an estimate and get the estimated result.

4.2. Build Panel Quantile Regression Model

This part builds a panel quantile regression model to conduct an empirical analysis of the consumption promotion effect of tax cuts and fee reductions in the context of the new dual-cycle development. The panel quantile regression model is also a weighted minimization residual error that modifies the traditional linear panel model. The regression estimation method of the sum of absolute values,in the form of:

$$Y_{it}(_T|\, X_{it}, D_{it}) = \alpha_i + \beta_T X_{it} + \theta_T D_{it} + \varepsilon_{T,it} \ . \tag{1}$$

Among them: Yit is the explained variable,Xit is the explanatory variable,Dit is the control variable,βT and θT are the marginal effect parameters at the Tth quantile,and εT,it is the unobserved random item.

In the traditional mean linear model,all sample points are given the same weight in the estimation procedure,so the relative importance of the sample points has nothing to do with the position of the sample points in the sequence;and in the quantile represented by equation (1) In the numerical model,the relative importance of the sample points is constrained by the weight of the sample points in the sequence. The sample points within a given quantile level are given a higher weight.

Therefore,the parameters βT,θT and εT,it are actually conditional estimates under the conditions of a given quantile and a sample set {Yit,Xit,Dit}. In the estimation procedure,the panel quantile model described by equation (1) is estimated by minimizing the conditional loss function in equation (2):

$$\min_{\alpha_{T,i}\beta_T} \sum_{T=1}^{T=M}\sum_{i=1}^{i=N}\sum_{t=1}^{t=T}\left|W_T L_T\right| \ . \tag{2}$$

Among them: WT is the weight of the quantile of T ∈ (1,2,...,M-1,M);LT is the loss function of the panel quantile model parameter estimation,LT is expressed by equation (3):

$$L_T = Y_{it}(_T|\, X, D_{it}) - \left(\alpha_i + \beta_T X_{it} + \theta_T D_{it}\right) + \lambda\left(\sum_{i=1}^{i=N}\left|\alpha_{T,i}\right|\right) . \tag{3}$$

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The panel quantile model can not only effectively eliminate the normal distribution assumption based on the minimum residual square sum panel model for the unobserved residual items;it can also analyze the heterogeneity and adjustment of the parameter values at different locations in the sample interval. Direction to better reflect the rich information in the sample data set. Therefore,this study chooses the panel quantile model for empirical analysis to improve the value and accuracy of the research.

4.3. Descriptive Statistical Analysis

The empirical test results show that digital financial inclusion still has a significant enabling effect on the expansion of rural domestic demand, and the driving effect on the expansion of rural domestic demand in developed areas is stronger than that of underdeveloped areas, which is in line with theoretical expectations. The relatively more complete level of digital financial inclusion in developed regions will naturally have a greater empowering effect on the expansion of domestic demand. The estimation result of model (2) shows that in developed areas. In the region, the direct effect of digital financial inclusion on the expansion of rural domestic demand is small, only 0.0237, while the indirect effect empowered by the consumption mediation effect is particularly strong, with an estimated coefficient of 0.1598. In less developed regions, digital financial inclusion Both the direct and indirect effects of the expansion of rural domestic demand are relatively small, and the total effect is also significantly smaller than that of developed regions. This may be due to the fact that residents in developed areas are more inclined to consume financial resources and are better at different forms of digital inclusive financial channels or products are used for consumption, such as diversified consumption through Ant Huabei, installment, credit cards, etc., while underdeveloped regions rely more on digital inclusive finance for production and operational investment. As a result, the direct effect of digital financial inclusion on the expansion of rural domestic demand (production and business investment) in developed and underdeveloped areas is relatively small, while the role of domestic demand expansion through the mediating effect of consumption is relatively different[7].

The increase in coverage indicates that digital inclusive finance has lowered the threshold for financial services. Small and medium-sized enterprises that cannot borrow from traditional financial institutions have begun to use digital inclusive financial products such as Alipay and mobile banking for loans, increasing the number of corporate users of digital inclusive finance. . And its coverage has gradually expanded from developed areas to remote areas, breaking the limitations of traditional financial regions and providing customers in remote areas with good financial services, thereby promoting the development of the real economy.

The increase in the depth of use shows that the functions of digital inclusive finance are gradually improving, and customers can enjoy a variety of services such as payment, credit, monetary funds, insurance, credit, and investment, which can not only ease the financing constraints of small, medium and micro enterprises, but also meet the needs of low cost. The financial needs of the income groups to promote the development of the real economy.

The degree of digitization can promote the growth of the real economy, indicating that digital inclusive finance has brought convenience and low-cost advantages to the economy. The emergence of mobile payment, QR code payment, etc. has made transactions more and more convenient. Transactions that cannot be realized in the context of traditional transactions are realized through digitization, thereby promoting the growth of the real economy. The effect of digitalization on the real economy is the weakest, probably because digital financial inclusion is in its infancy, and its hardware equipment and technical means are not yet perfect, while middle-aged and elderly users are more interested in digital financial inclusion. Difficulties in use may be present, so the impact of digitalization on the real economy is weak[6].

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The results of panel quantile regression show that digital financial inclusion has a significant role in promoting the real economy in different quantiles. As the quantile increases, the coefficient of the impact of digital financial inclusion on the real economy becomes smaller. Digital financial inclusion has a strong impact on the real economy at low quantiles, and a relatively weak impact on the real economy at high quantiles. The reason may be that areas with low real economic development may be rural, remote areas and other places. The emergence of digital inclusive finance makes it easy to obtain loans in these areas, promotes local entrepreneurship, and stimulates local market vitality. Hui Finance has a strong impact on the development of the real economy in places where traditional finance cannot reach. Regions with high real economy development are also developed regions, and traditional finance develops faster in developed regions. Therefore, the impact of digital inclusive finance on the real economy is weaker than in underdeveloped regions.

5. Research Conclusions and Policy Implications

Using provincial panel data from 2011 to 2018, this study uses a fixed effect model and an intermediary effect model to test the impact of my country's digital financial inclusion development on the real economy. Research conclusions: Digital financial inclusion has a significant promoting effect on the development of my country's real economy, and the breadth of coverage has the greatest effect, followed by the depth of use, and the degree of digitalization has the weakest effect. Digital financial inclusion can affect the development of the real economy through the intermediary variable of consumption level. The direct impact of digital financial inclusion on the real economy is stronger than the indirect impact, mainly through direct effects to promote the development of the real economy.

How to play the role of financial empowerment to expand domestic demand is the basis for smoothly advancing the internal economic cycle. Based on the theoretical analysis of the dynamic mechanism of digital financial inclusion on my country's domestic demand expansion, this article further uses my country's national sample data from 2011 to 2019, and takes the rural domestic demand market as an example to examine the dynamic effect of digital financial inclusion on my country's domestic demand expansion.

First, in theory, digital financial inclusion will enable the expansion of domestic demand through the mitigation mechanism of liquidity constraints, convenient transaction mechanisms, income growth mechanisms, marginal cost reduction mechanisms, and inclusive network effect mechanisms. The empirical study of the case further confirms that digital financial inclusion has a significant empowerment effect on the expansion of domestic demand. Specifically, digital financial inclusion will not only enable the expansion of domestic demand through direct effects, but also enable domestic demand through consumer intermediary effects.Need to expand, and there are significant regional differences.

Second, in terms of the difference in impact effects, digital financial inclusion has a stronger empowering effect on the expansion of rural domestic demand in developed areas than in underdeveloped areas. At the same time, the empowering effect of consumption intermediary effects in developed areas is significantly stronger than the direct effect. The direct effect of digital financial inclusion in developed areas on the expansion of rural domestic demand is equivalent to the intermediary effect of consumption.

Third, the estimated results of the control variables show that the per capita disposable income and the level of Internet informatization have the strongest promotion effect on the expansion of the rural domestic demand market, and the regional economic development level and industrial structure level have relatively weak promotion effects on the expansion of the rural domestic demand market, and It also shows that developed regions are stronger than underdeveloped regions.

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First, accelerate the construction of a digital inclusive financial system and strengthen development in all dimensions. First expand the coverage of digital financial inclusion, and then gradually increase its depth of use and digitalization. First, the government should vigorously publicize and support the development of digital inclusive finance and increase the coverage of digital inclusive finance. Provide more favorable prices for users who use digital financial inclusion to attract more users. Then, for micro, small and medium-sized enterprises that are difficult to obtain loans from traditional financial institutions, the links and procedures in the process of using digital inclusive finance are simplified to attract more micro, small and medium-sized enterprises. The government should vigorously develop digital inclusive finance in underdeveloped areas such as poor and remote areas, not only to strengthen the hardware construction but also to strengthen the software construction of the underdeveloped areas. In terms of hardware construction, it is necessary to strengthen the construction of Internet infrastructure and the maintenance of network security; in terms of software construction, provide financial and network security training to residents in underdeveloped areas to improve their financial literacy and reduce online fraud and financial risks. . Expand the coverage of digital inclusive finance by strengthening hardware and software construction in underdeveloped areas, and help the growth of the real economy in underdeveloped areas. The second is to strengthen the depth of the use of digital inclusive finance. Relevant enterprises and financial institutions should strengthen product innovation of digital inclusive finance, provide differentiated digital inclusive financial products for customers in different market segments, and increase digital inclusive finance. Depth of use of finance. Third, the government should also promote its digital construction, promote the construction of payment mobilization and facilitation, promote the expansion of the market scale, and help the development of the real economy.

Second, continue to pay attention to the impact mechanism of digital financial inclusion on consumption. Continue to pay attention to the impact mechanism of digital inclusive finance on consumption, stimulate consumption to affect domestic demand and promote the real economy. Digital inclusive finance can effectively promote residents' consumption, so it is necessary to strengthen the construction of consumer finance and payment services. Consumer finance should be improved and adjusted according to the needs of consumers, so that the business scope will be gradually improved. Strengthen the construction of network security, and create a good network consumption environment for consumers. At the same time, the state must also introduce laws and regulations related to online consumption, so that the rights and interests of digital inclusive financial consumers can be protected.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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