

The influence of digital finance on family wealth and income inequity in China

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Abstract: This study examines regional GDP and income levels using China's National Bureau of Statistics data, revealing persistent regional imbalances despite overall growth. Through correlation analysis and multiple linear regression model, introducing the Peking University Digital Financial Inclusion Index (2013-2020) and correlating it with disposable income, digital finance's positive impact on income is evident. Survey data indicates digital finance enhances payment, basic financial services, and counters institutional deficiencies. Utilizing the index and gray prediction model forecasts robust digital finance growth over the next decade.

Keywords: Digital finance; Household wealth; Income inequity; Asset allocation; Economic development

1. Introduction

Globally, 1.7 billion adults are still unbanked according to GPFI (2016). However, it is difficult for some low-income residents to obtain financial services from traditional financial institutions like banks caused by the high threshold. Unlike Traditional Finance (TF), digital finance (DF) is a new financial ecosystem, combining traditional financial institutions and technology companies to enable payments, investments and other financial services. In recent years, especially after the emergence of the COVID-19 epidemic, DF has played an increasingly prominent role in different fields. Some financial institutions and technology companies have relied on the financial technology advantages accumulated in the past to ensure the provision of basic financial services and effectively support the prevention and control of the epidemic and economic recovery. The emergence of DF and its development have dramatically changed how people live. Accordingly, in the context of continuous innovation in finance and digital technology, DF, which is dedicated to digitally meeting the needs of individuals for financial services, has become a research focus of man.

This report will discuss the distinction in income levels across areas in China, and whether DF affects the income and asset distribution of local people respectively. Additionally, the paper will predict the future trends and identify underlying effects of the digital mode to tackle inequality.

2. Literature review

2.1 The origin of digital finance in China and its relationship with traditional finance

DF started in China with the launch of Alipay in 2004. The commencement of DF in China can be measured from the launch of the Alipay system in 2004, and academics see the opening of Yu Ebao in 2013 as its first year (Huang & Yuan, 2022). Recently, technologies such as the Internet and smartphones, is developing rapidly, and digital financial services represented by online and mobile banking have become increasingly prevalent (Qi & Li, 2019). Wu (2015) classified DF into payment, financing, investment and digital currency. DF also includes financial information integration, and conventional financial digitisation (Huang & Yuan, 2022).

In terms of TF, typically, banks do not cater to low-income and rural markets (Owens, 2013). Consequently, the introduction of digital technology may improve TF, which is difficult to be available in some underdeveloped countries (Gomber et al., 2017). Innovative financial institutions in China have increased competitive pressures through digitalisation, affecting traditional institutions (Huang & Huang, 2018). The mode of internet finance are not limited by time and space, competing and having integrable opportunities simultaneously with TF (Liu et al., 2013). Traditional finance is actively digitised and intelligently transformed. Conventional financial institutions are also actively digitised and intelligently transformed (Dong & Zhao, 2018).

2.2 The potential impacts of digital finance on income level and inequality.

The economic development of China is extremely uneven, with traditional financial services trading centers clustered in the east (Fang & Xu, 2020). For the communities with low income, DF can reduce the barriers and costs of financial trade. Ferrata (2019) highlights that using digital remittance tools can reduce remittance costs by 3.5%. Furthermore, digitalization grants their increased access to affordable financial products like savings, credit, and insurance through digital trading platforms, enabling their participation in financial systems. Additionally, DF is likely to involve more women in the financial system. In Kenya, although more men than women have traditional bank accounts, more women possess mobile money accounts (Hendriks, 2019). However, Zhang & Li (2015) argued that the perception of multidimensional risk is an important obstacle to customers' willingness to use the Internet financially, manifested mainly in their apprehension about it.

From the family dimension, DF allows households to access a certain amount of capital more efficiently and cost-effectively, assuaging the liquidity constraints faced by them (Lyu et. al, 2023). Both the total and sub-indices of digital financial inclusion can improve the diversification of household asset allocation behaviour (Hu & Hou, 2022). Indeed, the emergence and widespread application of DF have provided households with more access to finance (Dong, 2022). Importantly, the negative impact on households with inferior financial asset ownership remains very limited (Lin & Zhang, 2022).

Research Questions:

- (1) What are the regional distribution of income and the attitudes of residents towards digital finance in China?
- (2) What are the effects on the allocation of household assets and income levels due to digital finance?
- (3) What are the future trends of digital finance and how could it play a crucial role in income inequality and/or on a broader level ?

3. Research methodology and model constructed

To explore the income and economic development distribution in China in recent years, this paper will collect the per capita disposable income of all Chinese people and the regional GDP from 2013 to 2021 from the NBSC. Since residents' use of and attitudes toward DF are relatively subjective, the survey will be conducted by questionnaire.

For question two, it is initially necessary to capture the changes in asset allocation since the advent of DF. From this perspective, the questionnaire is appropriate to obtain the primary source. Considering that some of the options could not accurately express the views of interviewees, both close questions and open questions will be introduced to enhance the reasonableness and accuracy of the results. For exploring how DF acts on revenue levels, this paper will utilise the methodology of Qiang and Shang (2022), and introduce the 2011-2020 Peking University Digital Financial Inclusion Index of China (PUDFIIC) to measure the degree of DF development, combine the disposable income to detect the relationship.

Models are constructed as follows:

Table 1. The definition of variables

Type	Variable	Abbreviation	Meaning
Dependent variable	Disposable income level	DI	Residents' disposable income in different areas in China.
Independent variable	Aggregate index	AI	Aggregate index of digital financial inclusion
	Digitalization level	DL	The digitalization index includes four measurement perspectives: mobility, affordability, creditability and convenience.
	Coverage breadth of digital finance	CB	Card subscriptions for Paypal accounts
	Usage depth of digital finance	UD	Actual use of digital financial services
	Payment service index	Pt	Actual use of digital financial payment services
	Insurance service index	Is	Actual use of digital financial insurance services
	Credit service index	Cr	Actual use of digital financial credit services

Model 1: The influence of aggregate index of digital financial index on disposable income level.

$$DI_{i,t} = \alpha + \beta_1 AI_{i,t} + \varepsilon$$

Model 2: The influence of digitalization level on disposable income level.

$$DI_{i,t} = \alpha + \beta_2 DL_{i,t} + \varepsilon$$

Model 3: The influence of coverage breadth of digital finance and usage depth of digital finance on disposable income level.

$$DI_{i,t} = \alpha + \beta_3 CB_{i,t} + \beta_4 UD_{i,t} + \varepsilon$$

Model 4: The influence of payment service, insurance service and credit service on disposable income level.

$$DI_{i,t} = \alpha + \beta_5 Pt_{i,t} + \beta_6 Is_{i,t} + \beta_7 Cr_{i,t} + \varepsilon$$

In order to explore the development trend of DF, this paper will use the 2011-2020 PUDFIIC to establish a Grey Forecast Model (GFM). The aggregate index of PUDFIIC is derived from considering different aspects of DF, hence the degree of macro DF development could represent the household use of DF from a micro perspective. Though the index covers a relatively limited number of years, the GFM is an effective instrument for dealing with small sample prediction problems.

4. Results analysis

4.1 Correlation analysis

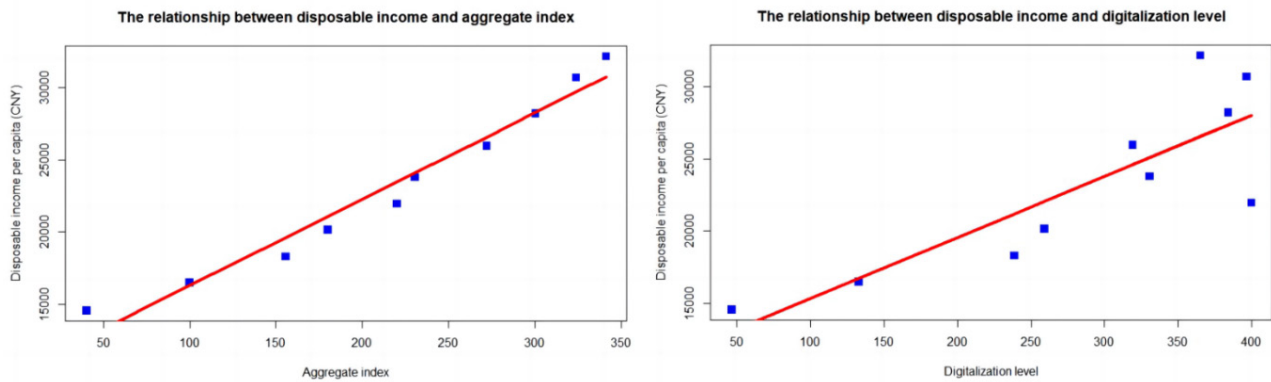


Figure 1. The correlation analysis of aggregate index and digitalization level with disposable income

4.2 Regression Analysis

Table 2. The regression results of factors of digital finance influencing income level

	Dependent variable: Disposable income (DI)			
	Model 1	Model 2	Model 3	Model 4
AI	79.443***			
	(16.738)			
DL		44.019***		
		(9.145)		
CB			6.637	
			(0.484)	
UD			77.660***	
			(5.763)	
Pt				3.011
				(0.175)
Is				7.131
				(1.585)
Cr				105.957***
				(5.518)
Constant	6012.281***	10419.007***	5489.560***	4639.633***

	(5.346)	(6.919)	(5.377)	(4.168)
N	309	309	309	309
R2	0.476	0.214	0.543	0.548
F	280.165	83.634	182.752	123.471
p	0.000	0.000	0.000	0.000

Note: ***p<0.01, **p<0.05, *p<0.1

In Model 1 and Model 2, the two coefficients are both significantly positive at the 1% level. As for Model 3, the coefficient on the usage depth of DF is significant at the 1% level, whereas the coefficient on coverage breadth is positive but insignificant. In terms of Model 4, only the coefficient on credit service is positive and significant at the 1% level. While the coefficients on payment and insurance are positive but not significant, demonstrating the enhanced effect of digital credit services on income growth.

4.4 Main Results of Questionnaire

Almost all interviewees use mobile payments in their lives, and more than half are willing to invest in digital platforms. For those who are reluctant to invest on digital platforms, the largest proportion of people with 38.1% consider that investing online is riskier than in a physical institution.

4.5 Predicted Trend

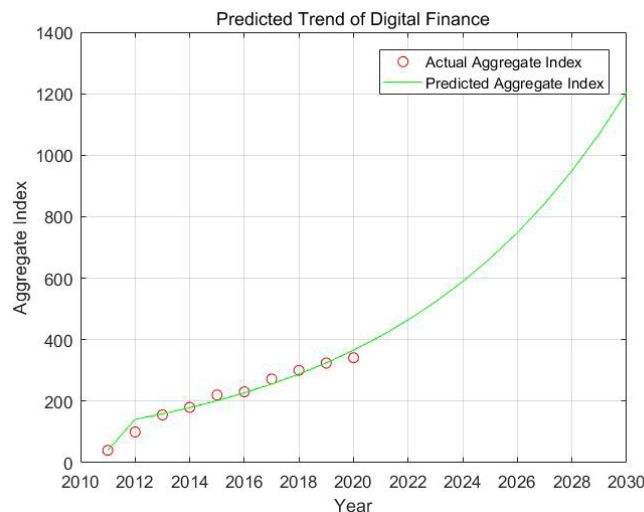


Figure 2. The predicted trend of digital finance

The Aggregate index of digital financial inclusion is predicted using the gray forecast model, which indicates an upward trend and a progressive increase in the overall index over the next ten years starting in 2020.

5. Discussion

5.1 What are the regional distribution of income and the attitudes of residents towards digital finance in China?

Based on the data, overall, China's per capita income levels are on an upward trend, while in line with the view of Fang and Xu (2020), the regional GDP and income distribution present an imbalance. Regarding residents' attitudes towards DF, the questionnaire results reveal that most people hold a positive attitude. Concerns about the ability to control the financial risks of internet financial institutions and the security of payment systems are important reasons that discourage customers from using DF, which is consistent with Zhang and Li (2015). This implies that residents have gradually started to accept DF, although it still takes time to establish confidence in it.

5.2 What are the effects on the allocation of household assets and income levels due to digital finance?

Initially, scatter plots show a strong correlation of aggregate index and digitalization level with disposable income. Further regressions reveal that a positive impact of DF on household income levels does exist. Among them, the positive and significant coefficient of credit services indicates that DF can enable some low-income people to access financial products such as credit and increase their welfare (Ferrata, 2019). The analysis from different perspectives of DF also reflects that the effect of DF is related to many factors.

Furthermore, the questionnaire results illustrate that the emergence of DF has made a difference in people's lives, mainly in terms of payments, basic financial services and compensating for the shortcomings of physical financial institutions. From the consumer's perspective, DF dramatically increases the convenience and diversity of payments, which according to Zhang (2020) is a better way to raise consumption levels than easing liquidity restrictions. DF can significantly improve the diversification of household asset allocation (Hu, 2022).

5.3 What are the future trends of digital finance and how could it play a crucial role in income inequality and/or on a broader level?

Through the gray forecast model, it is predicted that China's DF will maintain a healthy development trend. It is already known from previous analyses that the expansion of DF can usher in new shifts in the allocation of residents' income and assets. Contrary to TF, the development of DF does bring further wealth effects to the rich, while hardly undermining the equity of household consumption and income (Lin & Zhang, 2022), which reflects the inclusive properties of DF as well. It has the potential to promote equity, primarily motivated by the fact that the addition of digital technologies enables finance to serve more groups, especially those previously excluded from TF, such as some women, low-income families, and people living in remote areas (Gomber et al., 2017; Hendriks, 2019; Zhang et. al, 2020).

6. Conclusion

According to the analyses above, household use of DF has a significant positive effect on income, and payments, investments and basic business through digital platforms are essential channels through which DF affects peoples' lives and asset allocation. The majority of inhabitants currently possess optimistic attitudes towards DF, whereas households with relatively low-income levels are hesitant to invest in online platforms due to the underlying risk factors. Overall, DF is trending in a favourable direction and is likely to foster wealth accumulation for all households while alleviating inequalities caused by the restrictions of TF.

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