

How does Digital Finance Affect Common Prosperity ‘Dynamic Characteristics, Mechanism Identification’

Fang Liu*, Jinhe Song

School of Finance, Shandong Technology and Business University, Yantai, Shandong, China

**Corresponding Author.*

Abstract: This study investigates how digital financial inclusion influences common prosperity in China, using panel data from 204 cities between 2011 and 2019. By employing a dual-effect dynamic panel model and an intermediary effect model, it examines how digital finance impacts common prosperity through mechanisms such as increasing residents' disposable income and narrowing the urban-rural gap. The findings suggest that digital finance contributes to common prosperity significantly. These conclusions hold even after addressing potential endogeneity, substituting explained variables, and applying different testing methods. Analysis of dimensional heterogeneity reveals the fact that both the coverage breadth and usage depth of digital finance play vital roles in promoting common prosperity. Further mechanism testing identifies capital allocation efficiency as an intermediary factor, indicating that digital finance fosters common prosperity by improving the efficiency of capital allocation. The study highlights the need to accelerate regional digitalization, enhance financial inclusion, and promote equitable sharing of economic development benefits. Recommendations include advancing digital finance, encouraging rural entrepreneurship and innovation, expanding economic opportunities, and optimizing income distribution mechanisms to support common prosperity.

Keywords: Digital Finance; Mesomeric Effect; Common Prosperity for All

1. Introduction

1.1 Background and Significance of the Study

Achieving common prosperity requires a

phased approach, initially focusing on economic growth and high-quality development to raise income levels for the majority [1]. Since the reform and opening-up period, it has been witnessed rapid economic growth and a significant rise in residents' disposable income in China, with targeted efforts to alleviate poverty and bridge the urban-rural income gap. The rapid advancement of the digital technologies, including artificial intelligence (AI) and blockchain, has facilitated the finance and digital innovation integration. Digital inclusive finance has emerged as a powerful tool for reducing poverty and addressing income inequality. By leveraging big data and "soft information," it mitigates information asymmetry and enhances access to financing for marginalized groups, supporting their entrepreneurship and production, and increasing overall social income.

Digital inclusive finance, which balances fairness and efficiency, is an extension of inclusive finance and meets the need for financial innovation in high-quality development. On one hand, it provides more equitable access to credit, eliminating financial exclusion and promoting the growth of small businesses and disadvantaged groups. On the other hand, digital finance also plays a critical role in reducing information asymmetry and transaction costs, as well as optimizing capital allocation, which stimulates regional economic growth and increases per capita income. This, in turn, underscores the importance of digital inclusive finance in promoting common prosperity. However, while digital finance has significantly contributed to increasing rural incomes, its impact on narrowing the urban-rural income gap is more complex and may vary. Addressing how to further narrow this gap remains a key issue of both theoretical and practical concern.

1.2 Research Contents and Research Methods

The contributions of this study are reflected in several key aspects: (1) It systematically analyzes the theoretical logic about the relationship between digital inclusive finance and regional common prosperity from a dynamic perspective. It empirically tests the influence of digital inclusive finance on per capita disposable income and the gap of urban-rural income, using data from 204 cities in China from 2011 to 2019, providing valuable evidence on whether digital inclusive finance fosters regional economic growth. Moreover, it provides policy basis for financial institutions to effectively utilize the resources of inclusive finance to promote common prosperity. (2) It sheds light on the mechanism through which digital inclusive finance promotes regional common prosperity. It specifically investigates the mediating role of regional capital allocation efficiency, impact mechanisms, offering new insights demonstrating the effect of digital inclusive finance on common prosperity through this pathway. By clarifying the underlying logic of how digital inclusive finance promotes common prosperity, this research enriches the existing literature on its impact mechanisms, offering new insights into the broader relationship between digital finance and inclusive economic development. (3) Digital inclusive financial institutions are primarily evaluated using three key indicators, the breadth and depth of coverage, and the degree of digitalization. This study delves deeper into the influence of digital inclusive finance on achieving common prosperity by analyzing these indicators. The findings aim to provide practical insights on how to harness the distinct advantages of digital inclusive finance to foster common prosperity.

2. Research Hypothesis

2.1 Theoretical Analysis

From the perspective of "commonality," digital inclusive finance, with its characteristic of "inclusiveness," ensures equal access to financial services for diverse social groups, enhancing the financial accessibility of underdeveloped areas. This allows underdeveloped regions to overcome barriers to obtaining capital and ensures financial

support for vulnerable groups. Digital inclusive finance represents a modern financial service model that seamlessly integrates advanced digital technologies—for example big data, mobile internet, AI, cloud computing, and blockchain—with traditional financial services [2].

Digital inclusive finance has the potential to lower transaction costs, achieve low thresholds and low-cost financial services, and, with advantages such as being unrestricted by physical branch locations, extend services to "long-tail customers" who are traditionally excluded from financial services, such as low-income and vulnerable groups [3]. Therefore, digital inclusive finance embodies the principle of fairness in financial services; it can alleviate geographic, relational, conditional, and price-based exclusions faced by vulnerable groups, providing more people with the opportunity to access financial services [4].

From the perspective of "prosperity," the positive externalities of digital technology allow information to flow to market participants at very low costs, helping to tackle problems related to information asymmetry and transaction costs. By overcoming the limitations of physical branches and infrastructure, it facilitates the effective flow of capital and enhances the efficiency of financial services in supporting the real economy, thereby driving regional economic growth. Exchange rate fluctuations are an important factor affecting emerging economies' outward investment. Regression results from income-level-based sample groups reveal notable differences in the factors influencing outward investment among emerging economies with varying income levels. [5].

On one hand, small and medium-sized enterprises (SMEs) and vulnerable groups often encounter financing constraints due to information asymmetry and lack of collateral. Digital inclusive finance can record user fund usage and conduct credit ratings. Digital platforms can significantly reduce information asymmetry between credit parties based on transaction records, credit ratings, and other "soft information", provide financial support for small businesses with innovative potential, reduce financing constraints, stimulate social innovation vitality, and significantly promote

economic growth. Additionally, AI and cloud computing technology in digital inclusive finance improve the efficiency of data processing, risk pricing, and risk management. These technologies enable a deeper understanding of users' potential needs, expand transaction possibilities, and facilitate direct interactions between fund suppliers and demanders. This transformation not only broadens transaction boundaries but also reshapes traditional financial transaction models and organizational structures. [6].

The increased penetration, utility, and affordability of financial services enable vulnerable groups to access financial services at reasonable costs, providing them with opportunities to invest and accumulate capital. This, in turn, helps improve their income levels and address income distribution inequality, accelerates regional capital accumulation and technological innovation, and promotes regional economic growth. Based on the above analysis, this paper puts forward the following hypotheses H1, H1A, and H1B.

H1: Digital Pratt & Whitney Finance can promote shared prosperity across regions.

H1A: from a "Common" perspective, digital Pratt & Whitney Finance can narrow the urban-rural income gap.

H1B: from an "Affluence" perspective, digital Pratt & Whitney Finance improves the overall per capita disposable income of residents.

2.2 The Mechanism

Capital allocation efficiency refers to the degree to which capital flows from low-return industries to high-return industries. Information asymmetry, ownership and scale discrimination prevent the effective channeling of financial resources, resulting in inefficient capital allocation. Digital financial services, create mobile payments, credit, investment, credit and other new financial business models. Financial activities mainly promote economic growth by improving the efficiency of capital accumulation and distribution, that is, increasing investment in growth industries and allocating funds to projects with high production efficiency, in order to increase the marginal productivity and technological progress rate of capital and achieve optimal allocation of resources [7]. In contrast to traditional finance, Digital Pratt & Whitney

Finance has distinct digital, inclusive and inclusive characteristics. It effectively reduces the misallocation of financial resources and supports the real economy across various sectors [8].

Thus, digital Pratt & Whitney Finance can improve the efficiency of financial services for the real economy and promote regional economic growth and mutual prosperity by improving the efficiency of regional capital allocation. According to this analysis, the following hypotheses of H2, H2A and H2B are proposed.

H2: Digital Pratt & Whitney Finance promotes shared prosperity by increasing the efficiency of capital allocation across regions.

H2A: Digital Pratt & Whitney Finance improves the efficiency of capital allocation across regions to narrow the urban-rural income gap.

H2B: Digital Pratt & Whitney Finance promotes disposable income per capita by simultaneously improving the efficiency of capital allocation across regions.

3. Research Design

3.1 Variable Definitions and Data

(1) The interpreted variable

The degree of common prosperity. Previous studies have mainly examined the convergence characteristics of common prosperity by focusing on income, or expressed it as the percentage of middle-income groups. It is positively correlated with the level of common prosperity. Building on this premise, this article examines the level of common prosperity from two aspects. On one hand, it examines the improvement of residents' income levels, and chooses the residents' per capita disposable income (Inc) to represent it. If income increases, it indicates an increase in the level of prosperity; To analyze the degree of income polarization among residents, several indicators are commonly used in existing research to measure the gap of urban-rural income. These include the ratio of per capita disposable income between urban and rural residents, the Gini coefficient, and the Theil index. The per capita disposable income ratio focuses solely on residents' disposable income, overlooking population structure and failing to capture the nuances of population flow and migration between urban

and rural areas. The Gini coefficient, while useful for reflecting the overall income gap and particularly sensitive to changes in middle-class income, has significant limitations when applied to studies of the urban-rural income gap, as the income distribution of this group tends to be polarized toward both extremes. The Theil index not only fully considers the situation at both ends of the income class and the factors of population mobility, but also takes into account the population structure and income distribution, making it more suitable for this study. Therefore, this article chooses the Theil index as a measure of income inequality. A rise in the overall income level accompanied by a narrowing urban-rural gap indicates progress in achieving common prosperity.

$$Theil_{it} = \sum_{j=1}^2 \left(\frac{P_{ij,t}}{P_{i,t}} \right) \ln \left[\frac{P_{ij,t}}{P_{i,t}} / \frac{Z_{ij,t}}{Z_{i,t}} \right] \quad (1)$$

The formula represents the Theil index for city i in period t , where a smaller value indicates a narrower urban-rural income gap, and a larger value reflects a greater disparity. Due to the Theil index being between 0-1, this article multiplies it by 100 for ease of calculation and econometric regression.

(2) Data description

The primary data source for this paper is the Digital Inclusive Finance Index of Peking University (2011-2019), while using some data from the Statistical Yearbook of Chinese Cities and the Statistical Report on the

Development of Internet in China issued by China Internet Network Information Center. Due to the issue of data availability, this article standardized the above variables in the empirical process. Due to the deviation of Xizang's data, this paper will eliminate it. The following Table 1 presents the descriptive statistical analysis.

(3) Descriptive analysis

From the perspective of the urban-rural income gap, the standard deviation of 0.046 indicates significant differences across counties and periods. The average value of the Digital Inclusive Finance Index is about 4.956, with a standard deviation of 0.506, suggesting that while the development of digital inclusive finance has improved across different regions, the regional gap has gradually narrowed. However, there are significant regional differences in the three dimensions of coverage breadth, usage depth, and digitalization level.

From the perspective of controlling variables, there are significant differences in government support, which to some extent reflects the uneven distribution of fiscal support. The standard deviation of industrial structure is 7.479, indicating a need for further adjustments in industrial composition. Additionally, the pronounced disparities in openness to the outside world and levels of technological progress highlight the stratification of cities in terms of these two dimensions.

Table 1. Descriptive Statistical Analysis

Variable name	Variable symbol	Mean	Standard deviation	Minimum	Maximum	Skewness	Kurtosis
Urban-rural income gap	Theil	0.082	0.046	-0.357	0.279	0.483	9.123
Digital finance	Fin	4.956	0.506	2.972	5.714	-1.098	3.593
Coverage breadth	Cov	4.862	0.563	0.631	5.671	-1.688	7.263
Using Depth	Bre	4.923	0.515	1.456	5.786	-1.057	4.769
Digitization level	Dig	5.105	0.640	0.993	6.365	-0.461	2.287
Government support	Gov	6.140	7.479	1.878	31.208	2.254	6.389
Industrial structure	Ind	1.553	0.219	0.305	2.103	-1.190	6.882
External openness level	Ope	9.151	2.589	0.713	13.107	-1.180	3.530
Infrastructure	Inf	3.447	0.549	1.209	6.442	0.905	5.904
Financial development	Dev	3.489	0.541	2.135	6.550	0.773	4.124
Technical progress	Tec	7.452	1.641	1.099	11.848	0.062	3.076
Educational level	Edu	3.591	0.579	1.637	8.293	0.638	5.342

3.2 Model Settings

This article uses a dual effect dynamic panel data model to analyze how the digital finance

influence green development efficiency. This method takes into account that the efficiency of green development is a dynamically changing process. This helps to some extent

mitigate the endogeneity issue related to reverse causality. Additionally, both the city and year effects were controlled for in the analysis, effectively reducing the bias of the results. The benchmark regression model set is as follows:

$$Theil_{it} = \alpha_0 + \alpha_1 Theil_{i,t-1} + \alpha_2 Fin_{it} + \alpha_n X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

It is a problem that whether the efficiency of capital allocation serve as a mediator between digital inclusive finance and common prosperity. To clarify the transmission mechanism, this article adopts the intermediary effect "three-step method" and constructs the following model to explore the transmission path. Firstly, examine the direct influence of digital inclusive finance on common prosperity. Secondly, examine the direct effects of digital finance and intermediary variable capital allocation efficiency. Finally, capital allocation efficiency, digital inclusive finance, and common prosperity are added in the same regression model to test whether spatial correlation structural features play a mediating role. The model settings are as follows:

$$Inc_{it} = \alpha_0 + \alpha_1 Inc_{i,t-1} + \alpha_2 Fin_{it} + \alpha_n X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3)$$

$$Cap_{it} = \beta_0 + \beta_1 Cap_{i,t-1} + \beta_2 Fin_{it} + \beta_n X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (4)$$

$$Inc_{it} = \delta_0 + \delta_1 Inc_{i,t-1} + \delta_2 Fin_{it} + \delta_3 Cap_{it} + \delta_n X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (5)$$

$$Theil_{it} = \varphi_0 + \varphi_1 Theil_{i,t-1} + \varphi_2 Fin_{it} + \varphi_n X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (6)$$

$$Cap_{it} = \eta_0 + \eta_1 Cap_{i,t-1} + \eta_2 Fin_{it} + \eta_n X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (7)$$

$$Theil_{it} = \nu_0 + \nu_1 Theil_{i,t-1} + \nu_2 Fin_{it} + \nu_3 Cap_{it} + \nu_n X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (8)$$

4. Empirical Results and Analysis

4.1 Digital Finance Returns to Common-wealth Benchmarks

According to the previous analysis, this article tests the relationship between digital inclusive finance and common prosperity from two levels: income level and income gap. Table 2 shows the benchmark regression results analyzing the impact of digital inclusive

finance on common prosperity. All regressions account for time and regional fixed effects. The first and third columns exclude control variables, while the second and forth columns add them to examine the robustness of the results. According to the results, when controlling only for time and regional fixed effects, the regression results indicate that the coefficient for the impact on income level is significantly positive at the 1% level, while the coefficient for the impact on income inequality is significantly negative at the same significance level. Specifically, a 100% increase in the Digital Inclusive Finance Index corresponds to a 0.253-unit rise in the logarithm of per capita disposable income. These results highlight the significant contribution of digital inclusive finance development to promoting overall prosperity. Verified the hypothesis. With control variables, the regression coefficients that affect income level and income gap are significant at 5% level, with coefficient values of 0.318 and -1.101, respectively, indicating that digital inclusive finance promotes the improvement of income level and narrows income gap. Therefore, the development of digital inclusive finance supports the achievement of common prosperity, aligning with the theoretical analysis discussed earlier.

Regarding the control variables, the degree of openness to the outside world positively impacts residents' disposable income, indicating that stronger integration with global markets helps increase income levels. As digital finance continues to develop, it enables residents to take advantage of new financial opportunities, government support, opening to the outside world, education plays a significant role in narrowing the urban-rural income gap. The improvement of science, technology and education is essentially conducive to the diffusion of factors from urban agglomeration to rural areas under the market mechanism, through knowledge spillover, technology spillover and other mechanisms to promote factors in urban and rural flows and balanced allocation, and ultimately reduce the gap between urban-rural income. Additionally, optimizing the industrial structure can significantly contribute to narrowing this gap, indicating that the transition of rural labor from the primary sector to higher-paying jobs in the secondary and tertiary sectors

significantly narrows the gap of urban-rural income, underscoring the importance of

economic restructuring and labor mobility in reducing regional disparities.

Table 2. Digital Finance Returns to Common-wealth Benchmarks

Variable	Inc Theil			
	(1)	(2)	(3)	(4)
L.Inc L.Theil	0.682***	0.712***	0.451***	0.439**
Fin	0.253***	0.318***	-0.011*	-1.101**
Gov		0.146*		-0.0007*
Ind		-0.021*		-0.0004*
Ope		0.698*		-0.007***
Dev		0.002		0.006
Tec		0.031		0.006
Edu		-0.381*		0.039*
The constant term		0.413***		0.584**
Fix effect of year	Yes	Yes	Yes	Yes
Individual fixation effect	Yes	Yes	Yes	Yes
AR(1)-P Value	0.016	0.021	0.028	0.045
AR(2)-P Value	0.992	0.142	0.588	0.688
HansenInspection-P Value	0.469	0.243	0.676	0.493

Note: *, **, *** indicate significant at 10%, 5%, 1% levels, respectively.

4.2 Robustness Test

4.2.1 Alternative core interpreter variable

Digital inclusive finance is a comprehensive concept encompassing three key dimensions: the breadth of coverage, the depth of use, and the degree of digitization. The overall impact of digital inclusive finance on regional common prosperity is not comprehensive and requires more detailed multidimensional analysis [9]. The Peking University Digital Inclusive Finance Index includes both the primary total index used in the previous section and the coverage breadth, depth of use, and degree of digitization of the secondary index [10]. This article uses the breadth of digital finance coverage to further examine the robustness of the conclusion that digital finance promotes common prosperity.

4.2.2 Alternative core interpreter variable

To test the robustness of the previous conclusions, we replaced the explanatory variable with the per capita disposable income ratio between urban and rural residents. For data prior to 2013, the per capita net income of rural households was used instead of per capita disposable income. The robust test, as shown in Table 3, confirm that digital finance continues to reduce the urban-rural income gap significantly. After substituting the explained variables, the regression results are consistent with the primary findings, further confirming that digital finance contributes to reducing income inequality. This strengthens the robustness of the conclusion that digital finance plays a key role in narrowing the urban-rural income gap.

Table 3. Robustness Test

Variable	Replace the core interpreter variable			Replaces the interpreted variable			
	Inc	Inc	Inc	Theil	Theil	Theil	Avshouru
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
L.Inc	0.682***	0.435**	0.527**				
L.Theil				0.568***	0.734**	0.327**	
L.Avshou							0.674***
Fin							-0.539**
Cov	0.253***			-0.318**			
Bre		0.473*			-0.385***		
Dig			0.268**			-0.274*	
The constant term	0.690***	0.282**	0.665**	0.643***	0.428**	0.582*	0.381**
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR (1)-P Value	0.016	0.002	0.000	0.021	0.006	0.002	0.024
AR (2)-P Value	0.992	0.438	0.218	0.142	0.426	0.328	0.491
Hansen-P Value	0.469	0.251	0.639	0.243	0.218	0.842	0.538

Note: *, **, *** indicate significant at 10%, 5%, 1% levels, respectively.

4.2.3 DID model

Table 4. DID Model Results

Variable	Inc	Theil
	(1)	(2)
Gov	0.342**	-1.101**
Ind	-0.021	-0.0007*
Ope	0.249*	0.0004
Dev	0.004	-0.007***
Tec	0.042*	0.006
Edu	-0.526*	0.006
Tec	0.325***	0.039*
Post	1.523***	0.132**
Treat	-0.217*	-0.182**
Post*Treat	0.126**	-0.581**
The year is fixed	Yes	Yes
R-squared	0.387	0.141

Note: *, **, *** indicate significant at 10%, 5%, 1% levels, respectively.

A higher per capita wealth level indicates a greater focus on the development of digital inclusive finance, as well as an increase in people's financial literacy. Therefore, A reverse causality could exist between digital inclusive finance and regional economic growth. This article takes the "Plan for Promoting the Development of Inclusive Finance (2016-2020)" issued by the National Finance and Economics on January 15, 2016 as an external shock event, and uses the DID model to address the endogeneity issue arising from reverse causality. This policy plays a crucial role in advancing the development of inclusive finance, while having little influence on regional economic growth, making it suitable as an external shock event that affects the level of digital inclusive finance. The research sample time of this article was before 2016, with a Post value of 0; In 2016 and beyond, the value of Post is 1. Furthermore, the growth of digital inclusive finance can expand the reach, depth, and accessibility of financial services, and regions with high levels of financial development also have higher per capita real GDP. Following the research approach of [11], in this article, the digital inclusive finance level is categorized based on the annual median. Regions above the annual median are the experimental group, represented by Treat with a value of 1, while regions below the annual median are the control group, represented by Treat with a value of 0. The results presented in Table 4 show that the interaction terms of the DID

model are statistically significant at the 5% level. This indicates that the development of digital inclusive finance has not only significantly increased per capita disposable income in the region, but has also contributed to narrowing the urban-rural income gap. These findings align with the benchmark regression results discussed earlier.

4.2.4 Instrument variable

Although the previous study included as many control variables as possible, the research results may still be influenced by endogenous explanatory variables. First, a reverse causality issue may exist between regional per capita disposable income, the urban-rural income gap, and the development of digital finance. As regions experience higher economic development, they tend to have better conditions for the growth of technology and financial industries, and regions with higher income groups often have better development and more abundant resources, leading to faster digital inclusive finance development. Secondly, although variables that may have an impact on the explained variable in each model have been controlled, it still cannot avoid model estimation errors caused by omitted variables and measurement errors. Therefore, to mitigate potential endogeneity concerns in the model, this section employs appropriate instrumental variables to strengthen the robustness and reliability of the results.

This study uses the distance from each city to Hangzhou (IV1) as an instrumental variable to represent digital finance. Hangzhou serves as a financial hub, with cities closer to it typically exhibiting more active development of digital finance. Therefore, these two distance variables meet the requirements for instrumental variable correlation. Moreover, exogenous geographical distance does not directly affect per capita disposable income and income inequality, thus meeting the requirement of instrumental variable exclusivity. As these two distance variables lack a time dimension, this study conducts the estimation using panel data. The regression results reveal that digital finance significantly reduces the disparity between urban-rural income, thereby confirming the robustness of the findings. In addition, the mobile phone penetration rate (IV2) was used as another instrumental variable. The penetration rate of

mobile phones serves as an indicator of the infrastructure supporting digital finance and is closely tied to its development. Moreover, while digital technology has been improved significantly, the direct impact of mobile phone penetration on common prosperity and other control variables is relatively negligible. The per capita postal and telecommunications business volume (IV3) of each city in 1984 is selected as an instrumental variable to represent the development of digital inclusive finance. [12]. The post office has a profound impact on the regional digital finance development. The internet development level can be traced back to the popularity of telephone in early regions and the amount of post and telecommunications business. In the early years, regions with more post and telecommunications business may have higher digital finance levels at present, and the direct causal relationship between this historical factor and the current individual characteristics of residents and macroeconomic development is weak. Theoretically, it meets the

requirements that instrumental variables are highly related to endogenous explanatory variables and not related to the explained variables. However, this value is a fixed value, and the digital inclusive finance index varies over time. Therefore, the average digital inclusive finance index of all cities in the sample, except for this city, at the corresponding time point is calculated and multiplied with the postal and telecommunications business volume of the region in 1984. This indicator has a time-varying effect and is used as an instrumental variable. The results are presented in Table 5. As shown in the table, the F-value in the first stage is greater than 10, and the test for weak instrumental variables significantly rejects the null hypothesis, indicating a strong correlation between instrumental variables and explanatory variables. From the second stage perspective, while alleviating endogeneity, digital finance can still promote common prosperity.

Table 5. Tool Variable Method

Table 3: Two-Variable Method						
Panel A: The first stage						
Variable	Fin		Fin		Fin	
	(1a)		(2a)		(3a)	
IV ₁	0.043**					
IV ₂			0.023***			
IV ₃					-0.014***	
F value of the first stage	53.8		23.5		261.7	
Constant	2.443***		2.490***		2.321***	
Control variables	Yes		Yes		Yes	
Individual effect	Yes		Yes		Yes	
Panel B: The second stage						
Variable	Inc	Theil	Inc	Theil	Inc	Theil
	(1b)	(1c)	(2b)	(2c)	(3b)	(3c)
lnFin	2.427***	-0.326*	2.670**	-5.211**	1.923**	-4.231*
Constant	9.726***	3.19**	2.690***	3.91*	4.487**	2.34**
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Individual effect	Yes	Yes	Yes	Yes	Yes	Yes
Time effect	Yes	Yes	Yes	Yes	Yes	Yes

Note: *, **, *** indicate significant at 10%, 5%, 1% levels, respectively.

5. Mechanism Testing

How does digital finance work together? This paper will further analyze the role of capital allocation efficiency between digital finance and common prosperity. Since Model (3)-Model (8) contains the lag term of the interpreted variable, there may be an

endogenous problem. Both system GMM and differential GMM can mitigate the result bias caused by endogenesis. Compared with the differential GMM, the systematic GMM can improve the estimation precision, increase the validity of the instrumental variables, and alleviate the result bias caused by the endogeneity. At the same time, System GMM

and difference GMM include both one-step and two-step estimation methods. Compared to the one-step method, the two-step method provides more robust results as it is less susceptible to small-sample bias. Therefore, the two-step system GMM approach will be adopted to analyze models (3) through (8). As shown in Table 6, the p-value for AR (2) exceeds 0.1, suggesting the absence of second-order autocorrelation in the random error terms. This confirms the reliability of the model's specification. At the same time, Hansen test P value is greater than 0.05, it is difficult to reject the null hypothesis for the validity of all instrumental variables. This shows the instrumental variables of the dynamic panel data model are valid.

Table 6 presents the results of the influence of digital finance, capital allocation efficiency and disposable income per capita in columns (1)-(3). The results show a significant positive correlation between capital allocation

efficiency and the regression coefficient of digital finance, suggesting that the digital finance development level enhances capital allocation efficiency, which in turn boosts per capita disposable income. Column (4) to (6) is the regression result for digital finance, capital allocation efficiency and urban-rural income gap. The regression coefficients for capital allocation efficiency are both significantly positive, while these of the digital Pratt & Whitney Financial Index are significantly negative.

This paper confirms the existence of a mediating effect via capital allocation efficiency. Specifically, the digital finance development level positively affects the efficiency of capital allocation, which, contributes to the realization of common prosperity. This finding highlights the critical role of digital finance in improving resource allocation and promoting inclusive economic growth.

Table 6. The Mediating Effects

Variable	Inc Cap Inc			Theil cap Theil		
	(1)	(2)	(3)	(4)	(5)	(6)
L.Inc	0.712***		0.721*			
L.Theil				0.439***		0.517**
L.Cap		0.273***			0.273***	
Fin	0.318***	0.621***	0.418**	-1.101*	0.621***	-1.54**
Cap			0.412*			0.038**
Control Variable	Yes	Yes	Yes	Yes	Yes	Yes
Individuals	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.2357	0.634	0.231	0.142	0.032	0.041
AR (1)-P Value	0.009	0.000	0.000	0.004	0.036	0.000
AR (2)-P Value	0.138	0.274	0.158	0.201	0.389	0.275
Hansen-P Value	0.365	0.058	0.382	0.300	0.472	0.903

Note: *, **, *** indicate significant at 10%, 5%, 1% levels, respectively.

6. Conclusions

This article empirically examines the influence and underlying mechanism of digital inclusive finance on regional common prosperity, using data from 204 cities in China spanning the years 2011 to 2019, and draws three conclusions. The development level of digital inclusive finance can promote common prosperity among regions. Specifically, digital inclusive finance fosters regional economic growth and reduces the residents' income disparity between urban and rural areas significantly. After considering endogeneity, replacing core explanatory variables, replacing

dependent variables, and using DID methods, this conclusion remains robust. At the same time, common prosperity among regions can be influenced by the development level of digital inclusive finance through enhancing the efficiency of capital allocation in each region. As an innovative mode, digital finance can effectively reduce transaction costs, streamline financial processes, and enhance the efficiency and accessibility of financial services to support the real economy. Financial resources can flow from large enterprises with uncertain development prospects to potential industries, improving the regional capital allocation efficiency, promoting regional economic

development, as well as the common prosperity. Moreover, the sub-indicators of digital finance—such as coverage breadth, usage depth, and degree of digitization can still promote common prosperity.

Common prosperity is a general concept that cannot be divided into regions, but at the same time, common prosperity does not mean that everyone is prosperous at the same time, nor does it mean that all regions reach a certain level of prosperity at the same time. There may be certain differences in the degree of prosperity among different regions. Common prosperity is a systematic project that requires the joint efforts of all parties to promote it. Although digital inclusive finance can optimize capital allocation and promote common prosperity, the intrinsic advantages and potential of digital inclusive finance must be supported by a fair and equitable market environment. Building on the findings of this research, four key recommendations are proposed.

(1) We will continue to deepen the principal role of the market resource distribution and improve market-oriented approach to resource allocation. The design of Digital Pratt & Whitney Finance that is a fair and efficient financial supply side can enhance the effectiveness of capital allocation across different areas. Therefore, scientific institutional arrangements and effective market resource allocation model can provide a strong guarantee for digital Pratt & Whitney Finance to promote regional development.

(2) We should strengthen the development of regional marketization and legalization, pay attention to the design of a fair mechanism for process and result, create a good business environment, stimulate the initiative of entrepreneurial subjects, and adhere to the idea of market-oriented allocation of factors, play a positive role in enhancing the efficiency of regional capital allocation and fostering entrepreneurship, thereby supporting the development of the local economy.

(3) Considering regional differences, we should design a proper financial system to further promote the economic development of less-developed areas and achieve overall common prosperity. The policy of “First rich leads to second rich” in our country makes the regional development and the level of affluence appear obvious difference, but this

kind of difference is impossible to eliminate in the short term only depending on the power of market. Therefore, Macroeconomic regulation and control at the government level and differentiated institutional design should further balance the level of development among regions and gradually achieve real common prosperity.

(4) Although digital inclusive finance can achieve financial inclusion from a fair perspective and synchronously promote regional economic growth and common prosperity from an efficiency perspective, the widening income distribution gap in society still requires the government to play a regulatory role in redistribution. The government should enhance the mechanism of adjustment and redistribution. The primary methods include taxation, social security, or transfer payments, etc. This involves fully leveraging the roles of secondary and tertiary distribution to regulate high-income group earnings and pay close attention to the low-income groups through targeted policy support and employment expansion. By continuously reducing the gap of urban-rural income and wealth, these measures promote coordinated regional development and pave the way toward achieving common prosperity for all citizens.

Acknowledgments

We are grateful for the 2021 Shandong Provincial Social Science Planning and Research Project "Research on the Mechanism and Path for Improving the Quality of Shandong Province's Manufacturing Export Products Driven by Open Innovation" (21DJJJ05)

Reference

- [1] Ke Zou. Inclusive finance promotes common prosperity: theory measurement and empirical evidence. *Financial Economics Research*, 2021 (5): 48-62
- [2] Sixian Feng, Renjing Guo. Digital finance, banking competition, and banking efficiency. *Reform*, 2019. (11): 75-89.
- [3] Xiuhua Wang, Yaxiong Zhao. Is there a Matthew effect in the development of digital finance: a comparison of experiences between impoverished and non impoverished households. *Financial research*, 2020(7): 114-133.

- [4] Aghion P, Fally T, Scarpetta S. Credit Constraints As a Barrier to the Entry and Post -Entry Growth of Firms. *Economic Policy*, 2007. 22(52): 732-779
- [5] Ma Y. A study on the estimation of the desirable range of crossbordercapital flows in emerging economies. *China Social SciencesPress*, Beijing. (2023)
- [6] Haizhang Qian, Yunqing Tao, Songwei Cao. Theoretical and Empirical Study on the Development of Digital Finance and Economic Growth in China. *Research on Quantity Economy, Technology and Economics*, 2020(6): 26-46
- [7] Xiuhua Wang, Yaxiong Zhao. Is there a Matthew effect in the development of digital finance? - A comparison of experiences between impoverished and non impoverished households. *Financial Research*, 2020(7): 114-133
- [8] Chuanzhong Du, Yuan Zhang. The Regional Innovation Effect of Digital Finance under the Background of New Infrastructure Construction. *Financial Science*, 2020(5): 30-42.
- [9] Qiuzi Fu, Yiping Huang. The Heterogeneous Impact of Digital Finance on Rural Financial Demand: Evidence from the Chinese Household Finance Survey and the Peking University Digital Inclusive Finance Index. *Financial research*, 2018(11): 68-84
- [10] Wurgler J. Financial Markets and the Allocation of Capital. *Journal of Financial Economics*, 2000, 58(1/2): 187-214.
- [11] Min Song, Peng Zhou, Haitao Si. Fintech and Total Factor Productivity of Enterprises: A Perspective of "Empowerment" and Credit Allocation. *China's Industrial Economy*, 2021(4): 138-155.
- [12] Haizhang Qian, Yunqing Tao, Songwei Cao. Theoretical and Empirical Study on the Development of Digital Finance and Economic Growth in China. *Research on Quantity Economy, Technology and Economics*, 2020(6): 26-46.