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Impact of Digital Inclusive Finance on common prosperity in China's Social Media Era

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Abstract

Achieving common prosperity (CP) is a pivotal goal in China's modernization, particularly as social media increasingly shapes public awareness and policy discourse. In China's social media era, digital inclusive finance (DIF) has emerged as a key financial model impacting this goal. This study, drawing on data from Guangdong Province from 2011 to 2021 as an example, uses the entropy method to calculate the CP index and assesses the impact of DIF on it. Results indicate significant regional variations in CP levels and highlight the positive effects of DIF on it in Guangdong. The theoretical contribution of this study lies in understanding how financial inclusion interacts with social equity. In practical significance, the findings may provide some suggestions and decision-making basis for policy makers, promoting the coverage of DIF and driving sustainable socio-economic development.

Keywords: digital inclusive finance, common prosperity, entropy weighting method, fixed panel model

1. Introduction

Financial inclusion has emerged as a crucial global issue in recent years, essential for reducing poverty and promoting prosperity. The COVID-19 pandemic significantly accelerated the adoption of digital payments, catalyzing the development of DIF worldwide. Concurrently, social media has become a powerful tool in shaping public awareness and discourse around financial inclusion and inequality. According to OPHI's latest Global Multidimensional Poverty Index (MPI) report, over 18% of the population in 110 countries live in extreme poverty, underscoring persistent income inequality that threatens social stability and sustainable development.

In China, the goal of achieving CP is central to the vision of building a modern socialist nation. By the end of 2020, China had eradicated absolute poverty in all 832 of its impoverished counties. The rise of DIF, driven by technological advancements, offers promising potential in this endeavor. This new financial model aims to provide equitable financial services, reduce barriers, and integrate disadvantaged populations into economic and social development. In this process, social media plays a crucial role by amplifying the reach and impact of digital finance initiatives, raising awareness, and fostering engagement among diverse audiences.

However, as digital finance evolves, the "Matthew Effect"—whereby the wealthy benefit disproportionately while disadvantaged groups face new forms of financial exclusion—becomes a critical concern. Disparities in financial literacy and digital access among low-income populations may exacerbate these inequalities (Lei Ming, 2023; Wang & Zhao, 2020). Social media's influence in highlighting these issues and advocating for more inclusive financial solutions can help address such challenges. This study explores how DIF impacts CP in the social media era and provides targeted policy recommendations to enhance digital finance's effectiveness and inclusivity in different regions.

2. Literature Review

2.1 Digital Inclusive Finance

The concept of DIF was first proposed at the United Nations in 2005. DIF is defined as a financial system that effectively and comprehensively serves all sectors of society (Jiao, 2015). It primarily targets vulnerable groups such as the poor, micro-enterprises, aiming to provide them with fair financial services. In 2016, the G20 Hangzhou Summit released the "20 High-Level Principles for Digital Inclusive Finance", which defines it as any actions that utilize digital financial services to promote the development of inclusive finance. This definition highlights the two core aspects of

DIF: "inclusive" and "beneficial." The term "inclusive" emphasizes the broad coverage of financial services, creating profiles through fragmented user information to effectively reduce credit risks, thereby providing efficient, convenient, and affordable financial support to vulnerable groups (Wu et al., 2021). Additionally, the meaning of "beneficial" mainly lies in its inclusive nature towards the people. DIF utilizes digital technology to effectively alleviate the issue of information asymmetry in financial markets, enabling more people to enjoy the convenience of financial services. This characteristic not only embodies the core value of DIF but also plays a crucial role in promoting economic development and social progress (Qiu et al., 2018).

Currently, research on DIF largely focuses on its macro effects. For instance, Du et al. (2023) found that DIF positively contributes to economic resilience, specifically by fostering innovation and enhancing residents' consumption levels, thus promoting the economic resilience of a region. Furthermore, DIF has been shown to have a positive correlation with household wealth, with this relationship becoming more significant as the amount of household wealth increases (Wu et al., 2023). Additionally, scholars have demonstrated that digital finance has a significant positive impact on corporate ESG (Environmental, Social, and Governance) performance. It can achieve this by fostering green innovation, enhancing corporate reputation, and reducing agency costs (Xue et al., 2023). Through the analysis of the aforementioned literature, it is evident that DIF has been proven to have a positive impact on economic development. As the initial intention behind DIF is to provide fair financial services to the masses, this study aims to further explore whether DIF promotes fairness in financial services.

2.2 Common Prosperity

The concept of CP, as an ideal social state, aims to achieve a realm where all people, through relentless hard work and mutual support, ultimately attain material abundance and a comfortable life. The foundation of this idea lies in eliminating social polarization and poverty, striving for a universal and balanced state of prosperity. In terms of its essence, common prosperity aligns with concepts such as shared prosperity and inclusive growth, all aiming to enhance societal fairness and improve the well-being of the people (Wang & Cheng, 2021).

Tracing the origins of common prosperity, it can be observed that its earliest articulation can be traced back to Marx's "Economic Manuscripts" written between 1857 and 1858. In this significant document, Marx depicted a novel blueprint for a social system in which the social productive forces would undergo rapid development, to the extent that "production will no longer merely aim at material accumulation but at the prosperity of all individuals." This statement not only provides profound theoretical support for our understanding of common prosperity but also indicates the direction for us to pursue this goal. In December 1953, Chairman Mao Zedong first proposed the concept of "common prosperity," establishing a socialist system through socialist transformation, laying down the fundamental political prerequisites and institutional foundations for CP, and exploring beneficial pathways towards achieving it. In an article titled "Solidly Promoting common prosperity" published in the 20th issue of the magazine "Seeking Truth" in 2021, General Secretary Xi Jinping elaborated extensively on the rich connotations of CP, pointing out that it encompasses not only material abundance but also spiritual richness. This discourse provides essential guidance for a comprehensive understanding of CP, emphasizing the indispensable nature of dual material and spiritual abundance within the framework of CP.

Scholars such as Liu Peilin et al. have elucidated the essence of CP from various perspectives including political, economic, and social dimensions. They argue that under the backdrop of China's distinctive socialist system, CP entails the concerted efforts of the people, leading the nation to achieve advanced levels of productive forces surpassing those of other countries and regions worldwide, thereby sharing in a better quality of life (Liu et al., 2021). Scholar Li Shi emphasizes that CP signifies the prosperity of all citizens and not merely economic egalitarianism (Li, 2021). CP not only embodies a new stage of development in our country's governance but also represents a profound exploration by China into the issue of absolute poverty (Tan, 2020). Additionally, another group of scholars has empirically examined the impact of various factors on CP from perspectives such as healthcare environment (Dong et al., 2023; Yang et al., 2023), and healthcare accessibility (Chen & Zhang, 2023).

Research on the measurement of CP initially focused on measuring absolute poverty, which considers maintaining the basic level of consumption for survival (Orshansky, 1965). Atkinson proposed measuring inequality by constructing a social welfare function (Atkinson, 1970). This measurement method also became the theoretical basis for the early United Nations Development Programme in formulating the Human Development Index (HDI) (Wang & Zhang, 2021). Regarding the modern measurement of the concept of CP, most scholars have made preliminary attempts. Xiao et al. (2024) calculated the CP index from four sub-dimensions: adequacy of development, balance of development, fairness, and sharing, with results indicating significant regional heterogeneity in the development of CP, where the Eastern region's CP index is higher than the other three regions (Xiao et al., 2023). Notably, Xiao et al. (2024) constructed a CP index system from the perspective of the power of principal elements in three aspects: participation rights, income

integrity, and guarantee rights, revealing an increasing trend in the level of CP in various provinces in China, with the Eastern region demonstrating higher levels compared to other regions, Zhang et al., (2021) focused on regional disparities in the process of CP development, with research findings showing a significant acceleration in the convergence rate of income gap indicators between regions over time, further substantiating the gradual realization of CP (Gong et al., 2023). It is evident that most scholars mention the two primary indicators of "common" and "prosperity" in their index systems, but CP in China is a long-term dynamic process of advancement (Li, 2021; Li & Zhu, 2022). In evaluating the degree of CP, we must also focus on the developmental aspect of CP. Therefore, based on the comprehensive findings mentioned above, this study introduces the primary indicator of "sustainability," considering that "commonness," "prosperity," and "high-quality development" constitute the core essence of CP, with each aspect complementing and being indispensable to the others

2.3 Digital Inclusive Finance and Common Prosperity

Through literature review, it is found that DIF has been empirically proven to promote CP through inclusive growth, innovation and entrepreneurship effects (Zhou & Ni, 2021) , entrepreneurial activity (Han et al., 2023; Zhang et al., 2022), industrial institutional advancement (Qiu., 2023), and significant improvement in income and gap reduction by alleviating financing constraints (Liu et al., 2022). Specifically, Wang and Wang (2022), through analysis of data from various provinces in China, found that DIF finance. However, concerning the service efficiency of DIF in promoting the development of CP, the research findings of scholars Li and Hao (2022) indicate that in most provinces, the efficiency of DIF services in advancing the realization of CP has not yet reached an optimal state. Of particular note is the relative lag in technological progress, which is a crucial factor constraining the overall efficiency improvement of DIF. This finding provides important insights for a deeper understanding of the developmental bottlenecks and optimization pathways of DIF.

3. Method

3.1 Research Process

This study initiates by constructing a comprehensive CP system, incorporating various socio-economic indicators relevant to the concept of prosperity. Secondly, the entropy weight method is then applied to assess the relative importance of each constituent indicator within the CP framework, facilitating the derivation of the aggregated CP. Thirdly, a Fixed Effects (FE) model is utilized to regress the CP against the DIF, aiming to investigate the relationship between CP and the accessibility and inclusivity of digital financial services. This regression analysis helps to elucidate the extent to which digital financial inclusion contributes to overall prosperity, controlling for time-invariant individual effects. Finally, in addition to the regression analysis, this study conducts a thorough examination of the heterogeneity and robustness of the panel model employed, ensuring the validity and reliability of the finding.

3.2 Data Collection

Considering the availability of data, this study selected 20 prefecture-level cities in Guangdong Province from 2011 to 2022 as the research objects. The relevant data on DIF were obtained from the "Peking University Digital Inclusive Finance Index (2011-2022)[1]". The CP indicators data were sourced from the "Guangdong Statistical Yearbook". The data types are all panel data. Due to the completion of urbanization, Shenzhen City lacks relevant data on rural residents, and it is being considered for exclusion in subsequent analysis. The CP indicators data were sourced from the National Bureau of Statistics, CSMAR database, and others. In the data preprocessing stage, this study first dealt with outliers in the data. To avoid potential disturbances caused by extreme values in empirical analysis, this paper conducted a 1% interval truncation for some variables.

3.3 Variable Selection and Description

Dependent Variable: The dependent variable in this study is the level of common prosperity (CP). A review of relevant literature on CP (Chen et al., 2021; Lu et al., 2023) reveals that when conducting research on measuring CP, both the aspects of "common" and "prosperity" must be considered simultaneously. "Common" refers to ensuring that everyone has equal opportunities for fair development. Therefore, this study assesses the "sharing aspect" through three dimensions: social security, healthcare levels, and infrastructure. On the other hand, "prosperity" highlights the degree of development, indicating the increment of wealth in people's hands. Furthermore, high-quality development is the core theme of the "14th Five-Year Plan" and the future economic and social progress in China, serving as the fundamental prerequisite and inevitable path to achieve CP. Therefore, "development aspect" is considered as the third primary indicator (Lu et al., 2023) . In conclusion, the composite index of CP in this study will include three primary indicators: prosperity level, commonality degree, and sustainability, which are further categorized into nine secondary

[1] Source: Institute of Digital Finance, Peking University (pku.edu.cn)

indicators: prosperity level, commonality degree, social security, healthcare levels, infrastructure, openness, technological innovation, ecological environment, and development quality. The dimensional breakdown structure of CP is illustrated in Table 1. After initial data collection and screening, the indicator system for CP in this study includes 15 sub indicators to comprehensively reflect multiple aspects of CP.

Table 1. Comprehensive indicator system for common prosperity level

Primary indicator	Secondary indicator	Tertiary indicator	Attribution
Common degree U1	Balance degree U11	Urban-rural disposable income of resident ratio A1	-
		Urban-rural consumption expenditure ratio A2	-
	Sharing degree U12	Urbanization rate of permanent resident population A3	+
		Number of beds per 1,000 people A4	+
		The number of public trams per 10,000 people A5	+
		Basic endowment insurance enrollment rate A6	+
Wealth degree U2	Material wealth U21	GDP per capital B1	+
		Rural per capita disposable income B2	+
		Total retail sales of consumer goods B3	+
		Resident consumption contribution rate B4	+
		The proportion of the tertiary industry in GDP B5	+
Sustainable development U3	Digital development U31	R&D expenditure as a proportion of GDP C1	+
	Green and low carbon U32	unit GDP power consumption C2	+
		County urban sewage treatment rate C3	+
	Opening degree U33	Benefits of opening up C4	+

Explanatory Variable: Digital Inclusive Finance (DIF). In this study, we chose the Peking University Digital Inclusive Finance Index as the key explanatory variable to delve into the development status of digital finance. This index, jointly compiled by the Peking University Digital Finance Research Center and Ant Financial, possesses a wide coverage area, encompassing comprehensive indices from provincial to municipal levels and even some county levels. Furthermore, it includes three core sub-indices: digital coverage breadth, depth of usage, and degree of digitization, providing us with a comprehensive and in-depth perspective. Currently, domestic scholars commonly use this index as an authoritative reference when quantitatively studying the level of digital financial development, highlighting its significant position in the field of digital finance research (Xie et al., 2018) . Drawing inspiration from the data processing method of Qian et al. (2020) , this study normalizes the DIF data by dividing it by 1000 to enhance the standardization of data measurement.

Table 2. Variable description

Variable type	Variable name	Symbol	Variable measure
Dependent variable	Common prosperity	CP	a composite index composed of per capita disposable income of urban residents, etc.
Explanatory variable	Digital inclusive finance	DIF	total index of digital inclusive finance/1000
Control variable	Population	POP	the logarithm of the number of permanent residents at the end of the year
	Government intervention	GOV	logarithm of total fiscal expenditure
	Openness level	OPEN	foreign investment amount divided by GDP
	Financial deposit	DEP	represented by the logarithm of financial depositor deposits

Control Variables: Building on previous studies (Shi & Wang, 2023) , this study selected the following control variables: (1) Population Size (POP), measured as the logarithm of the year-end resident population; (2) Government Intervention (GOV), the logarithm of government fiscal expenditure; (3) Degree of Openness (OPEN), measured by the proportion of foreign investment to GDP; (4) Financial Deposits (DEP), measured as the logarithm of financial depositor deposits.

3.3 Model Building

3.3.1 Entropy Model

This study utilized the entropy method to measure the weights of the three-level indicators in the index system of CP and implemented the methodology using Python programming. The entropy method, as an objective valuation approach, exhibits significant advantages among numerous evaluation models. By analyzing the variability of each indicator and employing information entropy to calculate the entropy weight, the method adjusts the original weights to derive accurate indicator weights. The key aspect of this method lies in determining weights based on the inherent characteristics of the data, effectively avoiding biases that may arise from subjective factors. In comparison to other subjective valuation methods like Analytic Hierarchy Process (AHP), the entropy method can provide a more precise interpretation of research results with higher accuracy and greater objectivity. The implementation process of the entropy method mainly involves the following four steps:

Step 1: Indicator Standardization

Different indicators carry varying implications—some indicators are more favorable when higher (termed positive indicators), while others are more favorable when lower (termed negative indicators. This study initially standardized all indicators uniformly. Here, x'_{ij} represents the data of the j-th indicator in the i-th region in its original form, and x'_{ij}represents the standardized value of the j-th indicator in the i-th region after standardization.

Positive indicators：$x'_{ij} = x_{ij}$

Negative indicators：$x'_{ij} = \max(x_{ij}) - x_{ij}$

Step 2: Data Standardization

Indicators are scaled proportionally to fall within specific ranges, thereby eliminating dimensional influences and enabling comparison and weighting of indicators with different units or magnitudes. In this study, the commonly used method of mean deviation standardization is employed to process the data.

$$x^{*}_{ij} = \frac{x'_{ij} - \min(x'_j)}{\max(x'_j) - \min(x'_j)} \quad (1)$$

Step 3: Information Entropy Calculation

According to the definition of information entropy in information theory, the formula for calculating the information entropy of a dataset is:

$$E_j = -\frac{1}{ln\, n}\sum_{i=1}^{n} y_{ij}\, ln\, y_{ij} \tag{2}$$

$$y_{ij} = \frac{x'_{ij}}{\sum_{i=1}^{n} x^*_{ij}} \tag{3}$$

If $y_{ij} = 0$, then $\lim_{y_{ij}\to 0} y_{ij} \ln Pij = 0$

Step 4: Weight Calculation for Each Indicator

Calculating the weights of each indicator using information entropy.

$$w_i = \frac{1 - E_i}{k - \Sigma E_i}(i = 1,2, \dots \dots, k)$$

Table 3 shows the weights of each indicator in the comprehensive index of CP.

Table 3. The weight of each indicator in the common prosperity index

Tertiary indicator	Weights
Urban-rural disposable income of resident ratio A1	0.0107
Urban-rural consumption expenditure ratio A2	0.0115
Urbanization rate of permanent resident population A3	0.0765
Number of beds per 1,000 people A4	0.1246
The number of public trams per 10,000 peopleA5	0.1022
Basic endowment insurance enrollment rate A6	0.0890
GDP per capital B1	0.0639
Rural per capita disposable income B2	0.1993
Total retail sales of consumer goods B3	0.0272
Resident consumption contribution rate B4	0.1003
The proportion of the tertiary industry in GDP B5	0.0436
R&D expenditure as a proportion of GDP C1	0.0095
unit GDP power consumption C2	0.1416
County urban sewage treatment rate C3	0.0107
Benefits of opening up C4	0.0115

3.3.2 Regression Model

To verify hypothesis one and explore the relationship between DIF and CP, this study establishes the baseline regression model as follows:

$$CP_{i,t} = \alpha_0 + \alpha_1 DIF_{i,t} + \alpha_2 X_{i,t} + \mu_i + \theta_t + \varepsilon_{i,t} \tag{3}$$

Here, $CP_{i,t}$ represents the common prosperity index in region i and year t, $DIF_{i,t}$ denotes the digital inclusive finance

index, $X_{i,t}$signifies a series of control variables that may impact CP, μ_i and θ_t espectively denote the regional fixed effects and time fixed effects, $\varepsilon_{i,t}$ represents the random disturbance term.

4. Results

4.1 Descriptive Statistics

4.1.1. Basic Statistical Summary

Table 4 provides detailed descriptive statistics for each variable. Regarding the explanatory variable, the DIF index exhibits a maximum value of 0.339158 and a minimum value of 0.044630, indicating significant variations across different regions or time periods. As for the dependent variable, the CP indicator shows a considerable disparity between its maximum and minimum values, with the maximum reaching 0.643151 and the minimum being only 0.059238. This notable difference reflects the imbalance in CP levels among regions or different time periods, providing crucial insights for our further analysis.

Table 4. Descriptive statistics

Variables	N	Min	Max	Mean	Std
CP	240	0.059238	0.643151	0.236034	0.130320
DIF	240	0.044630	0.339158	0.227118	0.077998
POP	240	5.054716	7.539591	6.089185	0.523061
GOV	240	3.305787	7.541289	4.938966	0.960287
OPEN	240	7.990577	17.071338	14.051867	1.516012
DEP	240	5.566250	10.199068	7.427589	0.892197

4.1.2 Correlation Analysis

This study employed Pearson correlation coefficients to investigate the relationships among CP, DIF, POP, GOV, OPEN, and DEP, as presented in Table 5. The specific analysis revealed that CP exhibited significant correlations with DIF, POP, GOV, OPEN, and DEP, with correlation coefficients of 0.2565, 0.5369, 0.9311, 0.2684, and 0.8607, respectively, all greater than 0. These findings indicate a positive correlation between CP and DIF, GOV, IND, POP, and OPEN. The correlation coefficient between the CP index and the DIF index was 0.2565, suggesting a strong relationship between the two variables, providing preliminary support for Hypothesis 1 in this study.

Table 5. Variable correlation analysis

	CP	DIF	POP	GOV	OPEN	DEP
CP	1					
DIF	0.2565***	1				
POP	0.***	0.0811**	1			
GOV	0.9311***	0.2340***	0.6903***	1		
OPEN	0.2684***	-0.4692***	0.2087***	0.2822***	1	
DEP	0.8607***	0.3312***	0.7818***	0.9315***	0.0935**	1

Note: “***”, “**”, “*” represent significant at the significance levels of 0.01, 0.05, and 0.10, respectively.

4.2 Baseline Regression Results

In this study, the DIF index is employed as the explanatory variable, while the CP index serves as the dependent

variable, with POP, GOV, OPEN, and DEP serving as control variables. Three panel models are included: fixed effects (FE) model, random effects (RE) model, and a pooled (POOL) model. A fixed effects model accounts for entity-specific effects that are assumed to be constant and specific to each entity, while a random effects model treats unobserved effects as random and independent of the observed variables. A mixed effects model combines aspects of both fixed and random effects, allowing for flexibility in handling both within-entity and between-entity variability.

The PanelOLS function from the Python linearmodels library is utilized for model estimation, and the results are presented in Table 6. From the results, it can be observed that all three models have achieved good results, indicating that DIF has a significant positive promoting effect on CP.

Table 6. Model regression results

Item	RE	FE	POOL
DIF	0.1286**	0.2744*	0.0408*
	(-3.9647)	(-6.5657)	(-0.905)
POP	-0.0262**	-0.0254**	-0.0733**
	(-3.4996)	(-3.5231)	(-7.8356)
GOV	0.0253**	-0.004	0.1052**
	(-2.6558)	(-0.4026)	(-10.619)
OPEN	0.0084**	0.0074	0.0077
	(-6.4311)	(-5.9086)	(-3.002)
DEP	0.0817**	0.0601	0.0514
	(-7.7432)	(-5.2897)	(-4.1492)
const	-0.4835**	-0.202**	-0.3367**
	(-6.9643)	(-2.2256)	(-6.1807)
R 2	0.7740	0.7862	0.8971

Note: “***”, “**”, “*” represent significant at the significance levels of 0.01, 0.05, and 0.1, respectively.

To ensure model consistency, we conducted a Hausman test and combined it with an F-test for model selection. Upon executing the relevant commands using the statsmodels library in Python, the results are presented in Table 7.

Table 7. Test results

Test type	Statistical value	P-value
F test	37.840	P = 0.000
BP test	712.910	P = 0.000
Hausman test	31.177	P = 0.000

Specifically, the F-test exhibits significance at the 5% level, with a calculated F-statistic of 36.840 and a corresponding p-value of 0.000, indicating significance below 0.05. This suggests that the FE model is more advantageous compared to the POOL model. Furthermore, the BP test also demonstrates significance at the 5% level, with a chi statistic of 712.910 and a p-value of 0.000, indicating the superiority of the RE model relative to the POOL model. However, the results of the Hausman test also show significance at the 5% level, with a chi statistic of 31.177 and a p-value of 0.000, indicating that the FE model is more applicable compared to the RE model. In light of the comprehensive analysis

above, this study ultimately selects the fixed effects (FE) model as the final model outcome to ensure the accuracy and reliability of the research.

Initially, utilizing the DIF index as the independent variable and the CP index as the dependent variable, regression results were obtained. Subsequently, control variables including Population Size (POP), Government Intervention (GOV), Degree of Openness (OPEN) and Financial Deposits (DEP) were incorporated into the model and regressed together, yielding the results as presented in Table 8. The regression results indicate a positive correlation between the CP index and the DIF index, with a regression coefficient of 0.401, which remains significant at the 1% level. The regression coefficients of POP, OPEN and DEP are all positive and significant at the 5% level, indicating that the three control variables are conducive to achieving the goal of CP. The regression coefficients for government intervention (GOV) in relation to CP is negative.

Table 8. FE regression results

ITEM	CP (Control variables not included)	CP (Add control variables)
DIF	0.4012***	0.2744**
	(24.764)	(6.5657)
POP	-	0.273**
		(-3.5231)
GOV	-	-0.0040
		(-0.4026)
OPEN	-	0.0074***
		(5.9086)
DEP	-	0.0601***
		(5.2897)
const	0.1449***	-0.2020**
	(37.260)	(-2.2256)
R 2	0.7369	0.7862

Note: “***”, “**”, “*” represent significant at the significance levels of 0.01, 0.05, and 0.1, respectively.

4.3 Regional Heterogeneity

Given the significant disparities in resource allocation and economic development levels across various regions in Guangdong, this study delves into the regional heterogeneity of the impact of digital financial inclusion on CP. Based on regional categorization, the study focuses on four distinct areas: Northern Guangdong (Shaoguan, Heyuan, Meizhou, Qingyuan, Yunfu), Western Guangdong (Yangjiang, Zhanjiang, Maoming), Eastern Guangdong (Shantou, Shanwei, Chaoyang, Jieyang), and the Pearl River Delta region (Guangzhou, Zhuhai, Foshan, Huizhou, Dongguan, Zhongshan, Jiangmen, Zhaoqing). Through regression analysis, it was observed that the influence of DIF on CP varies significantly across different regions (as shown in Table 9).

Table 9. Regional heterogeneity analysis

Item	Northern Guangdong	Western Guangdong	Eastern Guangdong	Pearl River Delta region
DIF	0.1956***	0.3701***	0.2566***	0.2744***
	(4.9813)	(4.5589)	(3.5455)	(6.5657)
POP	-0.0150**	-0.0313***	-0.0423**	-0.0254***
	(-2.0482)	(-3.8982)	(-3.3795)	(-3.5231)
GOV	0.0110*	-0.0017	-0.0152	-0.0040
	(1.3792)	(-0.9704)	(-1.1513)	(-0.4026)
OPEN	0.0019*	0.0046**	0.0019	0.0074***
	(0.0864)	(2.5289)	(1.0677)	(5.9086)
DEP	0.0352***	0.0461**	0.0218	0.0601***
	(3.2211)	(2.3238)	(0.9507)	(5.2897)
const	-0.1266*	-0.1292	0.2411*	-0.2020**
	(-1.8661)	(-0.8952)	(1.8317)	(-2.2256)
R 2	0.9472	0.9360	0.8004	0.7862

Note: “***”, “**”, “*” represent significant at the significance levels of 0.01, 0.05, and 0.1, respectively.

Regardless of whether in Northern Guangdong, Western Guangdong, Eastern Guangdong, or the Pearl River Delta region, DIF exhibits a promoting effect on CP. The facilitating effect is most pronounced in Western Guangdong, followed by the Pearl River Delta. This disparity may be attributed to the relatively lagging financial system and public infrastructure in Western Guangdong. Developing DIF in these regions can significantly enhance the quality and coverage of financial services, effectively alleviate financial exclusion, and thereby amplify the marginal promoting effect on CP.

4.4 Robustness Tests

4.4.1 Replacing Regression Models

The regression model results from Table 5 indicate that even when employing the random effects model (RE) and mixed effects model (POOL) for robustness testing, the estimated coefficient of the DIF development index remains significantly positive. This suggests that the model exhibits high robustness, indicating a significant promoting effect of DIF development on CP.

4.4.2 Replacing Explanatory Variables

In order to strengthen the credibility and reliability of the study's conclusions, a strategic adjustment was made during the regression analysis phase. Specifically, the explanatory variable representing the DIF index was substituted with data from DIF that was lagged by one period. By doing so, the research aimed to assess the model's robustness and stability over time, ensuring that the conclusions drawn were not overly influenced by short-term fluctuations or anomalies in the data. This approach allowed for a more comprehensive examination of the relationship between DIF and the variables under investigation, thereby enhancing the overall validity of the findings.

From the results in Table 10, it is evident that the regression coefficient of DIF is 0.135, with a p-value less than 0.01. The regression results of the lagged one-period DIF index align with the baseline regression, indicating the robustness of the model. This implies that DIF significantly promotes the improvement of CP, confirming hypothesis H0.

Table 10. Regression results of digital inclusive finance lagging one period

Item	CP	CP (DIF lag one period)
DIF	0.2744**	0.1354***
	(6.5657)	(3.6430)
POP	0.273**	-0.0314***
	(-3.5231)	(-4.3063)
GOV	-0.0040	0.0241**
	(-0.4026)	(2.3772)
OPEN	0.0074***	0.0092***
	(5.9086)	(6.6119)
DEP	0.0601***	0.0919***
	(5.2897)	(7.6832)
const	-0.2020**	-0.690***
	(-2.2256)	(-1.510)
R 2	0.7862	0.7759

Note: “***”, “**”, “*” represent significant at the significance levels of 0.01, 0.05, and 0.1, respectively.

5. Discussion

In the era of social media, the impact of DIF on CP is multifaceted, covering the accessibility and convenience of financial services, as well as its broader socio-economic effects. This study effectively evaluates the relationship between DIF and CP in the social media era. Overall, the Common Prosperity Index in Guangdong has shown an upward trend year by year, indicating that the goal of CP is becoming increasingly achievable. In this process, government has played a leading role. It has issued numerous policies to promote common prosperity, which have brought great benefits to the previously impoverished groups. The inclusiveness, wealth, and sustainability of society have been improved. Additionally, the fixed effects regression model reveals that DIF has a significant positive impact on achieving CP. Through technological innovation, DIF has lowered the barriers to traditional financial services, enabling a larger population to access the financial services they need, thereby driving the realization of CP. The development of social media has provided an essential platform for promoting DIF, allowing information and financial resources to reach those in need more efficiently. On social media platforms, many entrepreneurial individuals have discovered excellent opportunities to showcase their ideas, access marketing and business resources promptly, foster individual entrepreneurship (Triwardhani, Alhamuddin, & Putra, 2023), and contribute to the advancement of CP. The heterogeneity analysis at the end of the study shows that the impact of DIF on CP varies by region, with significant effects observed in the Pearl River Delta, Northern Guangdong, Western Guangdong, and Eastern Guangdong, the strongest of which is in Western Guangdong. Relatively speaking, Western Guangdong faces a greater scarcity of financial services, and DIF has helped improve financial inclusion, enabling disadvantaged groups to better integrate into the economic system, thus promoting CP.

Based on the research findings above, this paper proposes the following main policy recommendations. First, the government should strengthen the development of DIF, as it can effectively improve financial accessibility for low-income groups, enhancing their financial management skills and sources of income. To further advance CP, policies should increase investment in digital financial infrastructure in rural and remote areas, improve internet coverage, and ensure that more residents have equal access to digital financial services. Additionally, supporting financial technology innovation and inclusive services is crucial. Policies should encourage fintech companies to innovate products and services, particularly those designed for micro and small businesses, rural residents, and low-income groups. These innovations can not only increase financial service accessibility but also reduce transaction costs, improve transparency and fairness, and effectively promote economic development in impoverished regions and among vulnerable groups. Finally, the government should focus more on DIF in Western Guangdong, as it has the greatest impact on common prosperity. This suggests that, at the same level of DIF development, common prosperity will be more widespread in

Western Guangdong.

6. Conclusion

The development of social media has provided a crucial platform for promoting DIF, enabling information and financial resources to reach those in need more efficiently. Moreover, CP is a fundamental requirement of socialism. Therefore, whether DIF can contribute to the realization of CP warrants further investigation. This study selected panel data from 20 prefecture-level cities in Guangdong Province between 2011 and 2022. It constructs a comprehensive well-off society index based on 13 indicators from three dimensions: commonality, prosperity, and high-quality development. It has been confirmed that DIF has a positive effect on the realization of CP and exhibits regional heterogeneity.

The innovation of this research lies in effectively evaluating the achievement of the CP. Achieving CP is a pivotal goal in China's modernization. By applying the entropy weight method to calculate the common prosperity index and conducting empirical analysis, this study provides quantitative data support, enabling an objective evaluation of DIF's impact on common prosperity. Additionally, the results offer differentiated policy recommendations. Promoting inclusive digital finance has been proven to have a significant positive effect on the achievement of the common prosperity goal. More specifically, greater attention should be given to the development of DIF in Western Guangdong, as its impact on common prosperity is most pronounced in this region. The limitation of this study is that it is limited to Guangdong Province, which may limit the generalizability of the research results in other regions of China or other countries. Therefore, a wider geographical scope can enhance the external validity of the research. In addition, to deepening the interpretation of conclusions in future. Subsequent research could further enhance the explanation of the impact mechanism of DIF on CP, exploring the inherent correlations and causal relationships to enhance the depth and breadth of the research.

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Authors contributions

Qin Xiong assumes full responsibility for all aspects of this study, including study design, data collection, manuscript drafting, and revision. As the sole contributor, Qin Xiong has carried out every step of this research independently, without any special agreements regarding authorship. Qin Xiong has thoroughly read and approved the final manuscript.

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References

Atkinson, A. (1970). On the measurement of inequality. *Journal of Economic Theory, 2*(3), 244-263. https://doi.org/10.1016/0022-0531(70)90039-6

Chen, B., & Zhang, X. (2023). Path analysis and empirical test of medical service enhancement for common prosperity under government participation. *Frontiers in Public Health, 11,* 1076355. https://doi.org/10.3389/fpubh.2023.1076355

Dong, K., Wei, S., Liu, Y., & Zhao, J. (2023). How does energy poverty eradication promote common prosperity in China? The role of labor productivity. *Energy Policy, 181,* 113698. https://doi.org/10.1016/j.enpol.2023.113698

Du, Y., Wang, Q., & Zhou, J. (2023). How does digital inclusive finance affect economic resilience: Evidence from 285 cities in China. *International Review of Financial Analysis, 102709.* https://doi.org/10.1016/j.irfa.2023.102709

Orshansky, M. (1965). Counting the poor: Another look at the poverty profile. *Social Security Bulletin, 28,* 3-29.

Wu, F., Cui, F., & Liu, T. (2023). The influence of digital inclusive finance on household wealth: A study based on CHFS data. *Finance Research Letters, 58,* 104460. https://doi.org/10.1016/j.frl.2023.104460

Xue, L., Dong, J., & Zha, Y. (2023). How does digital finance affect firm environmental, social and governance (ESG) fulfillment? Evidence from Chinese listed firms. *Heliyon,* e20800. https://doi.org/10.1016/j.heliyon.2023.e20800

Yang, B., Wu, Q., Sharif, A., & Uddin, G. S. (2023). Non-linear impact of natural resources, green financing, and energy transition on sustainable environment: A way out for common prosperity in NORDIC countries. *Resources Policy, 83,* 103683. https://doi.org/10.1016/j.resourpol.2023.103683

Chen, L., Yu, J., & Xu, Y. (2021). Constructing the common prosperity index model. *Governance Studies, 37*(4), 5-16. http://journal08.magtech.org.cn/Jwk3_zlyj/CN/

Gong, B., Qian, Z., & Li, S. (2023). Measurement and driving mechanisms of common prosperity. *Quantitative Economic and Technical Economics Research, 40*(12), 5-26.

Guo, F., Kong, T., Wang, J., Zhang, X., Cheng, Z., Ruan, F., Sun, T., & Wang, F. (2016). China's digital inclusive finance indicator system and index compilation. *Peking University Digital Finance Research Center Working Paper.*

Han, L., Peng, Y., & Meng, Q. (2023). Digital inclusive finance, entrepreneurial activity, and common prosperity: An empirical study based on provincial panel data in China. *Soft Science*, *37*(03), 18-24. https://doi.org/10.13956/j.ss.1001-8409.2023.03.03

Jiao, P., Sun, T., Huang, T., & Wang, T. (2015). Digital currency and inclusive finance development: Theoretical framework, international practices, and regulatory systems. *Financial Supervision Research*, (07), 19-35. https://doi.org/10.13490/j.cnki.frr.2015.07.002

Li, J., & Hao, F. (2022). Efficiency measurement of digital inclusive finance services for common prosperity. *Statistics and Decision*, *38*(17), 140-144. https://doi.org/10.13546/j.cnki.tjyjc.2022.17.027

Li, S. (2021). Goals and pathways for achieving common prosperity. *Economic Research Journal*, *56*(11), 4-13.

Li, S., & Zhu, R. (2022). Promoting common prosperity through income distribution system reform. *Management World*, *38*(01), 52-61+76+62. https://doi.org/10.19744/j.cnki.11-1235/f.2022.0002

Liu, F., & Zou, K. (2024). Impact of digital inclusive finance on common prosperity and its regional heterogeneity: A perspective of coordination among prosperity, equality, and sharing. *Journal of Hunan Agricultural University (Social Science Edition)*, 1-10. https://doi.org/10.13331/j.cnki.jhau(ss).2024.02.012

Liu, P., Qian, T., Huang, X., & Dong, X. (2021). Connotations, pathways, and measurement methods of common prosperity. *Management World*, *37*(08), 117-129. https://doi.org/10.19744/j.cnki.11-1235/f.2021.0111

Liu, X., Huang, Y., Huang, S., & Zhang, T. (2022). Digital inclusive finance and common prosperity: Theoretical mechanisms and empirical facts. *Financial Economics Research*, *37*(01), 135-149.

Lu, T., Duan, L., & Song, M. (2023). Construction and measurement of a comprehensive evaluation system for common prosperity. *Journal of Statistics*, *4*(05), 16-28. https://doi.org/10.19820/j.cnki.ISSN2096-7411.2023.05.002

Ming, L., Ma, Y., Zhang, X., & Liu, Z. (2023). Research on the impact of digital inclusive finance on common prosperity: Empirical evidence from prefecture-level cities. *Investment Research*, *42*(10), 44-61.

Qian, H., Tao, Y., Cao, S., & Cao, Y. (2020). Development of digital finance and economic growth in China: Theory and empirical evidence. *Quantitative Economic and Technical Economics Research*, *37*(06), 26-46. https://doi.org/10.13653/j.cnki.jqte.2020.06.002

Qiu, G., Cao, Y., & Zheng, K. (2023). Impact of digital inclusive finance on common prosperity. *Journal of Philosophy and Social Sciences*, *Fujian Agricultural and Forestry University*, 26(06), 49-57.

Qiu, H., Huang, Y., & Ji, Y. (2018). Impact of financial technology on traditional banking behavior: The perspective of internet financial products. *Financial Research*, (11), 17-29.

Shi, Y., & Wang, X. (2023). Can digital inclusive finance promote common prosperity?—An empirical study based on panel data of prefecture-level cities. *Enterprise Economy*, 42(08), 48-59. https://doi.org/10.13529/j.cnki.enterprise.economy.2023.08.005

Tan, X. (2020). Research on solving relative poverty in the path to common prosperity. *China Rural Economy*, (06), 21-36.

Triwardhani, I. J., Alhamuddin, Adwiyah, R., & Putra, R. P. (2023). The use of social media in product marketing activities of micro, small and medium enterprises. *International Journal of Productivity and Quality Management*, *38*(1), 123-141.

Wang, H., & Chen, J. (2021). Theoretical connotations and quantitative methods of common prosperity. *Finance and Trade Economics*, 42(12), 18-33. https://doi.org/10.19795/j.cnki.cn11-1166/f.20211207.001

Wan, Y., & Zhang, N. (2021). Measurement of inequality aversion and the human development index adjusted for income inequality: A study based on the Atkinson social welfare function. *Quantitative Economic Research*, 12(02), 115-133. https://doi.org/10.16699/b.cnki.jqe.2021.02.009

Wang, P., & Wang, K. (2022). Research on the impact of digital inclusive finance on common prosperity. *Finance and Economics*, (07), 3-10+39. https://doi.org/10.19622/j.cnki.cn36-1005/f.2022.07.001

Wang, X., & Zhao, Y. (2020). Does digital finance development exhibit a Matthew effect?—An empirical comparison between poor and non-poor households. *Financial Research*, (07), 114-133.

Wu, Y., Li, X., Li, J., & Zhou, L. (2021). Development of digital finance and effectiveness of household financial asset allocation. *Management World*, 37(07), 92-104+107. https://doi.org/10.19744/j.cnki.11-1235/f.2021.0094

Xiao, L., Zhang, Z., & Yang, H. (2024). Quantitative measurement of common prosperity: Theoretical basis, indicator construction, and empirical interpretation. *Contemporary Finance*, 1-16. https://doi.org/10.13676/j.cnki.cn36-1030/f.20240202.001

Xie, X., Shen, Y., Zhang, H., & Guo, F. (2018). Can digital finance promote entrepreneurship?—Evidence from China. *Economics (Quarterly)*, 17(04), 1557-1580. https://doi.org/10.13821/j.cnki.ceq.2018.03.12

Xu, Y., & Wu, W. (2022). Study on the effects of digital inclusive finance development on common prosperity: Empirical analysis based on 287 prefecture-level cities. *New Finance*, (11), 33-40.

Yan, W. (2023). Research on the impact of digital inclusive finance on common prosperity. https://doi.org/10.27274/d.cnki.gsdjc.2023.000674

Yu, F., & Yang, W. (2022). Mechanisms and effects of digital inclusive finance in promoting common prosperity. *Journal of Shandong University of Finance and Economics*, 36(06), 1-13+66.

Yu, J., Zhou, J., & Cui, M. (2022). Digital inclusive finance and inter-regional common prosperity: Theoretical logic and empirical evidence. *Journal of Shanxi University of Finance and Economics*, 44(10), 1-15. https://doi.org/10.13781/j.cnki.1007-9556.2022.10.001

Zhang, J., Dong, X., & Li, J. (2022). Can digital inclusive finance promote common prosperity?—Empirical research based on micro household data. *Finance and Economics Research*, 48(07), 4-17+123. https://doi.org/10.16538/j.cnki.jfe.20220316.101

Zhang, L., Deng, Z., Zhang, C., & Liu, P. (2023). Basic logic, pattern measurement, and regional differences of common prosperity in China. *China Population Science*, 37(05), 113-128.

Zou, K., & Ni, Q. (2021). Promoting common prosperity through inclusive finance: Theory, measurement, and empirical evidence. *Financial Economics Research*, 36(05), 48-62.