

Study on the influence mechanism of digital economy on common prosperity

He Min*

School of Economics, Anhui University, Hefei, China

Abstract: To achieve common prosperity is the essential requirement of socialism. In the new stage of development, the development of digital economy is of great significance to the realization of common prosperity. On the basis of analyzing the theory of digital economy promoting common prosperity, the entropy right method was used to calculate the development index of digital economy and common prosperity in prefecture-level cities, and the panel data of 29 provinces in the period from 2005 to 2019 were ically tested using Stata16.0. The study found that the digital economy is conducive to the realization of common prosperity, and it is realized by optimizing resource allocation, improving the level of technological innovation, and promoting coordinated development.

1 Introduce

1.1 Research Background And Significance

Prosperity and strength of the people is China's development goal. Common prosperity is an essential requirement of socialism with Chinese characteristics, an important feature of Chinese-style modernization, and an important part of realizing the Chinese Dream of national rejuvenation. Currently, China's digital economy is booming, reaching 39.2 trillion yuan in 2020, with a growth rate of 9.7 percent. In the future, China will rely on massive data resources, complete industrial system, rich application scenarios and other multiple advantages to promote the development of digital economy, the goal of common prosperity will also rely on the promotion of digital economy gradually realized. Digital economy will become the main driving force for future economic growth. It is of great practical significance to study the mechanism and optimization path of digital economy enabling common prosperity and to build a new relative balance in development.

The academic research on digital economy and common prosperity is mainly discussed from a macro perspective. Xiang Yun et al. (2022) tested the panel data of 31 provinces (autonomous regions and municipalities) in China and reached the conclusion that digital economy promotes common prosperity¹. Through empirical test, Liu Weili et al. (2023) found that the effect of enabling common prosperity in digital economy is significantly heterogeneous, and the effect is more obvious in the western region, the dimension of digital industrialization and the high-level development stage of digital economy². The possible contribution of this paper is as

follows: conforming to the new wave of digital technology development, this paper focuses on the influence mechanism of digital economy and common prosperity from the perspective of research. On the basis of expounding relevant theories, this paper clarifies the mechanism through which digital economy affects common prosperity and carries out empirical test.

1.2 Research methods and innovation of the paper

Research technique:

Literature combing method. By sorting out and summarizing the relevant literature, the paper provides research ideas for this paper on the basis of fully absorbing the existing literature research experience and achievements, and clarifies the marginal contribution of this paper.

Method of quantitative analysis. Combined with the relevant theory and mechanism interpretation, using the relevant data, the theoretical mechanism is empirical test, draw relevant conclusions, and put forward specific policy suggestions.

Innovation:

First: Analyze the function mechanism of digital economy to promote common prosperity;

Second: From the two dimensions of sharing and development, 11 indicators are selected to comprehensively measure the common prosperity from various aspects.

*Corresponding author: 2796554674@qq.com

2 Related theoretical basis

2.1 Digital economy

The most representative definition of the concept of "digital economy" is the G20 Initiative on Digital Economy Development and Cooperation. The declaration is an important outcome of the 2016 Hangzhou Summit. According to the Action Plan, digital economy is a series of economic behaviors that take digital knowledge and information as the main production factors, modern information network as the main carrier, efficient use of information and communication technology as the driving force, and improvement of efficiency and optimization of economic structure as the main driving force. Different from agricultural economy and industrial economy, which take land, labor and capital as key factors of production, digital economy takes data as the core factor of production in essence³. The Fourth Plenary Session of the 19th CPC Central Committee included data as a factor of production for the first time⁴. Vice Premier Liu He pointed out in his guidance report that in the process of the development of economic activities to the direction of digital, the multiplication effect of data has become more and more obvious, and it has become a new factor of production with the characteristics of The Times. In the 14th Five-Year Plan, "Accelerating Digital Development, Building Digital China" is divided into a separate chapter, proposing to accelerate the construction of digital economy, digital society, digital government and digital ecology. In 2016, the scale of China's digital economy increased from 22.6 trillion yuan to 45.5 trillion yuan, growing at a rate of 20.27 percent and accounting for 39.8 percent of GDP, according to the White Paper on China's Digital Economy Development (2022) released by the China Academy of Information and Communications Technology. Digital economy plays a pivotal role in China's development.

2.2 Common prosperity

According to the "Opinions of the CPC Central Committee and The State Council on Supporting the High-quality Development and Construction of Zhejiang Demonstration Area of Common Prosperity", "Common prosperity means that all the people through hard work and mutual help, generally achieve a rich life, spiritual self-confidence and self-improvement, livable and suitable working environment, social harmony and harmony, public services universal, and realize all-round human development and social progress. Share the fruits of reform and development and a happy life". Therefore, common prosperity is a multi-dimensional concept. Besides material life, it also includes spiritual life, ecological environment, social governance and public services. According to the academic consensus, the connotation of common prosperity can be summarized into the following four aspects: first, to achieve the level of wealth, eliminate absolute poverty; second, we are committed to achieving prosperity for all. Third, the

material and spiritual level of all-round prosperity; fourth, the gap between regions, urban and rural areas or groups is within a reasonable range. To achieve common prosperity, we must continue to raise per capita income and narrow the gap between people, regions and urban and rural areas in the process of high-quality development⁵.

3. Model and data

3.1 Model building

The p-value obtained by Hausman test is 0.0000, which rejects the original assumption of using the random effects model. Therefore, the fixed effects model is adopted, and the individual effects and time effects are taken into account. Finally, the two-way fixed effects model is selected to test the influence of Chinese digital economy on common prosperity. The designed measurement model is:

$$Y_{it} = \beta_0 + \beta_1 digital_{it} + \alpha X_{it} + u_i + u_t + \varepsilon_{it}$$

Where, Y is the common prosperity level of the explained variables, digital represents the digital economy, i and t represent the random disturbance term, X_{it} represents the control variable set, the specific variables and their symbols and meanings refer to Table 3, u_t is the time dummy variable, u_i is the region dummy variable, ε_{it} represents the random disturbance term. Beta represents the coefficient of each variable.

3.2 Index selection

3.2.1 Index construction

This paper makes a comprehensive discussion on the connotation of common prosperity and digital economy. Based on the actual situation and relevant data, an index system for measuring the development of common prosperity is constructed from 11 specific indicators from the three dimensions of affluence, equality and sharing. Detailed data are shown in Table 1^{6,7,8}. A total of 8 specific indicators are constructed to measure digitalization level from two aspects: the construction level of digitalization infrastructure and the degree of digitalization application. Detailed data are shown in Table 2³.

In terms of weight assignment, entropy weight method is an objective weighting method. It determines weights according to the data information reflected by each index, avoids errors and deviations caused by subjective weighting, and can more accurately reflect the contribution of each index to the whole, thus providing us with a reliable tool.

Table 1. Index system of common prosperity

Level 1 indicators	Secondary indicators	Indicator direction
Prosperous	Per capita disposable income of urban residents	the first month of the lunar year
	Per capita disposable income of rural residents	the first month of the lunar year
	The average salary of	the first month of the lunar

	employed persons in urban units	year
Equal	Urban-rural income ratio	burden
	The Gini coefficient of the industry income gap	burden
	The incidence rate of rural poverty	burden
	Gini coefficient of income	burden
Enjoy together	Average years of education	the first month of the lunar year
	Public transport vehicles per 10,000 people	the first month of the lunar year
	Number of Internet broadband access users per 100 people	the first month of the lunar year
	Share of social security expenditure in GDP	the first month of the lunar year

Table 2. Digital level measurement indicators

Level of infrastructure construction	Mobile phone exchange capacity (ten thousand households)
	Internet access port density (one / 10,000 km ²)
	Total telecom business volume (RMB 100 million yuan)
	The proportion of urban information transmission and employment is (%)
Degree of digital application	Software revenue (RMB 100 million yuan)
	Mobile phone penetration rate is (%)
	The proportion of e-commerce enterprises is (%)
	E-commerce purchase amount (RMB 100 million yuan)

3.2.2 Control variables

The variables selected in this paper include the level of economic development (RGDP) measured by GDP per capita. Human capital (HL) is calculated according to the per capita human capital released by the China Human Capital Index Report, 2020. The unemployment rate (ur) is measured by the registered urban unemployment rate published by the National Bureau of Statistics. Urbanization level (CITY) is measured by the urban population / total population of each prefecture-level city. Detailed data description is shown in Table 3.

Table 3. Meaning of variables

Variable name	variable symbol	variable declaration
Time	Year	
Common prosperity	Y	explained variable
Digital economy	Digital	explanatory variable
Per capita GDP	ln (rgdp)	The actual per capita GDP of each region
Jobless rate	ur	Registered urban unemployment rate
Human capital	ln (hum)	The China Human Capital Index Report, 2020, taking the logarithm
Urbanization level	ul	Urban population / total population of each prefecture-level city

4 Empirical analysis

4.1 Descriptive statistics

Table 4. Descriptive statistics

variable name	Sample capacity	Mean	Std.Dev.	Min	Max
Common prosperity (Y)	435	0.24	0.14	0.04	0.89

The Digital Economy (Digital)	435	0.11	0.09	0.01	0.50
Per capita GDP	435	10.46	0.65	8.96	11.76
Unemployment rate (ur)	435	3.46	0.66	1.37	4.52
Human capital (hum)	435	5.65	0.49	4.69	6.78
Urbanization level (ul)	435	0.54	0.13	0.29	0.89

Descriptive statistics were performed for the relevant variables in the model using Stata16.0. As can be seen from Table 4, from 2005 to 2019, the maximum value of the common prosperity index of all provinces and cities was 0.891, and the minimum value was 0.0449, indicating that the different regions of China have obvious polarization and a large gap.

4.2 Empirical analysis

Table 5. Benchmark regression result

Y	
model (1)	
Digital	0.139*** (0.016)
per capita GDP (lnrgdp)	0.0372** (0.0158)
Jobless rate ur	-0.275*** (-0.0912)
Human capital ln(hum)	0.0323*** (0.0099)
Urbanization level ul	-0.105*** (-0.0362)
Observations	435
R-squared	0.845
Province fixed effect	YES
Year fixed effect	YES

***p <0.01, **p <0.05, *p <0.1

Table 5 shows the results of the return of the digital economy to common prosperity. According to the modified goodness of fit (R-squared) 0.845, a relatively high proportion, indicating that the regression results are effective and reasonable. In the model (1), the impact of digital economy on common prosperity is significantly positive at the level of 1%, indicating that the development of digital economy is conducive to the improvement of the level of common prosperity in China. Among the control variables, the estimated result of per capita GDP was at the 5% significance level, and the economic level changed by 1 unit, which drove the common prosperity index increased by 0.139 units. The coefficient of unemployment rate is negative and significant at the significance level of 1%, indicating that the increase of unemployment rate is not conducive to the realization of common prosperity. The regression coefficient of human capital is positive and significantly shows at the significance level of 1% that the development of education contributes to the realization

of common prosperity. The regression coefficient of urbanization level is negative, and it is significant at the significance level of 1%, indicating that with the expansion of urbanization, the gap between urban and rural areas has widened, which is not conducive to the realization of common prosperity.

4.3 Robustness test

This paper uses the variable lag method to alleviate the possible endogeneity problems. In order to weaken the effect of reverse causality, this paper selects the digital financial inclusion index as the explanatory variable to re-estimate. The results are shown in Table 6, and the digital financial inclusion coefficient is still significantly positive, which is consistent with the previous benchmark regression.

Table 6. Robustness test results

Y	
model (2)	
Digital	0.055*** -3.57
Per capita GDP ln(rgdp)	0.129*** -8.5
Jobless rate ur	-0.339*** (-3.65)
Human capital ln(hum)	0.144** -2.08
Urbanization level ul	-0.147*** (-4.09)
Observations	435
R-squared	0.887
Province fixed effect	YES
Year fixed effect	YES

***p < 0.01, **p < 0.05, *p < 0.1

5. Policy proposal

The author in measuring the common prosperity from three dimensions select 11 indicators, measuring digital economy from digital infrastructure and digital application degree, select eight indicators, using the entropy method for city common prosperity index and digital economy development index, using China's 435 cities in 2005-2019 panel data, study the influence of digital economy development on common prosperity. The study found that the digital economy has a significant effect on promoting common prosperity. So the future development to digital economy and industrial resources fully integrated penetration, constantly provide consumers with better quality, more convenient digital products and services, create more meet the needs of the people of the new consumption scenarios and

consumption patterns, give full play to the common prosperity effect of digital economy, actively explore the digital information technology application in various fields of business model, help all residents the realization of a better life.

References

1. Xiang Yun, Lu Qian, Li Zhixuan. The development of digital economy enables common prosperity: influence effect and action mechanism [J]. Securities Market Herald, 2022, No.358(05):2-13.
2. Liu Weili, Chen Tengpeng. Does the digital economy promote common prosperity?— Based on the research perspective of regional coordinated development [J]. Contemporary Economic Management, 2023,1-19.
3. Liang Dongliang, Lai Xiongli. The digital economy promotes common prosperity research — is based on a balanced growth perspective [J]. Theoretical Discussion, 2022, No.226(03):57-62.
4. Zhang Xinwei, Jiang Changliu. Research on the process of data and its integration mechanism with the digitalization of traditional industries [J]. Shanghai Economic Research, 2021, No.390(03):60-69.
5. Liu Cheng. Digital Economy and Common Prosperity: Theoretical analysis based on income distribution [J]. Research on Financial Issues, 2022 (04): 25-35.
6. Ouyang Zhigang. Whether the promotion of urban-rural economic integration in China has blocked the expansion of the urban-rural income gap [J]. The World Economy, 2014,37 (02): 116-135.
7. Wang Sen. Empirical study on the impact of urbanization on the urban-rural income gap [J]. Statistics and Decision Making, 2018,34 (23): 110-113.
8. Hu Zhigao, Cao Jianhua, Long Hui. Does the rural human capital transfer expand the urban-rural income gap — Analysis based on the perspective of level effect, self-spillover effect and reverse spillover effect [J]. Agricultural technology and economy, 2018 (11): 30-43.