



# Promoting Common Prosperity through Digital Finance: Analysis based on the Zhejiang's Common Prosperity Demonstration Zone

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**Abstract.** This article explores the role of digital finance in promoting common prosperity, using Zhejiang Province as a case study. Through factor analysis and logistic regression studies on the data, it is found that improving the convenience of daily life significantly influences residents' satisfaction with common prosperity policies. Moreover, addressing the issues of residents' mistrust and lack of financial knowledge and policy understanding, recommendations are provided for the government, communities, and residents. This research provides empirical analysis and policy recommendations for leveraging digital finance to promote common prosperity.

**Keywords:** Digital Finance, Common Prosperity, Factor Analysis, Logistic Regression, Improvement Recommendations

## 1 Introduction

Digital finance refers to the new generation of financial services that combines internet and information technology with traditional financial service modes. Until this point, the most notable advantage displayed by digital finance is its support for the development of inclusive finance (Huang and Huang, 2018) [4]. The CF40 Digital Inclusive Finance Research Group pointed out that the large-scale application of digital technology effectively alleviates the conflicts between "high risk, high cost, low returns" in inclusive finance, promoting the large-scale and sustainable development of inclusive finance through various government support models and technological innovations in microfinance. According to the China Internet Network Information Center, data indicates a significant scale of digital finance usage among rural internet users in China. As of June 2018, the number of rural internet users in China reached 211 million, with an internet penetration rate of 36.5% in rural areas. Additionally, 57% of rural internet users utilize mobile network payments. Zhang et al. (2020) [8] noted that the development of digital finance increases consumption by reducing residents' time, significantly enhancing the rural economy. Therefore, digital finance plays a strong driving role in the development of common prosperity.

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What factors influence the promotion of shared prosperity through digital finance, Tian et al. (2020) [7] analyzed the spatial differences, trends, and existing shortcomings of financial inclusiveness among provinces and regions by constructing a financial inclusiveness index system. Guo et al. (2020) [3] pointed out that the development of digital finance is influenced by geographical factors. Qi and Li (2019) [6] identified income level, educational attainment, and age as factors affecting the adoption of digital financial services among Chinese residents. These studies have focused on specific factors without simultaneously considering the impact of multiple factors. Additionally, these studies have not taken into account the residents' satisfaction with shared prosperity.

In this paper, we utilize factor analysis on questionnaire data to identify and summarize three major factors that influence the promotion of shared prosperity through digital finance: the implementation of shared prosperity policies, economic development factors, and convenience of daily life factors. Using residents' overall satisfaction as the dependent variable obtained from the questionnaire, logistic regression is conducted to examine the impact of these three factors on residents' overall satisfaction. The results reveal that the development of the Internet and the convenience of daily life have a greater influence on residents' satisfaction. The implications and discussions of these findings are provided, along with corresponding recommendations.

The main contributions and innovations of this paper lies in:

1. The factors from multiple angles are comprehensively considered, and the three factors in the overall data are extracted by factor analysis. Based on this, the research makes the research variables more sufficient.

2. Using overall satisfaction of residents as an evaluation indicator is more suitable for reflecting the concept of shared prosperity.

3. Policy recommendations for utilizing financial technology to drive common prosperity are given through the three paths of technological innovation, industrial upgrading, and wealth growth.

## 2 METHODOLOGY

Zhejiang Province has representative characteristics in terms of its area and population structure nationwide. As a demonstration zone for high-quality development and the construction of shared prosperity, Zhejiang has already achieved some institutional innovation in areas such as market economy, environmental improvement, and social governance. Therefore, studying the situation of digital finance in Zhejiang and its contribution to shared prosperity is of great significance.

### 2.1 Questionnaire Design

In addition to the basic information such as gender, age, and income typically included in the questionnaire, this study designs the questionnaire based on ten variables related to digital finance and shared prosperity: happiness index, democratic rights, wealth gap, living environment, cultural and entertainment activities, internet-based financial services, income level, ease of borrowing and lending, convenience of payments, and

internet development. The questionnaires were distributed through field surveys, with a total of 602 questionnaires distributed and 589 questionnaires collected, resulting in a response rate of 97.84%. Among them, there were 579 valid questionnaires, leading to an effective rate of 98.3%.

## 2.2 Factor Analysis

After conducting the Bartlett's test (Bartlett, 1950) <sup>[1]</sup> and KMO test (Kaiser, 1974) <sup>[5]</sup>, the existing variable set  $\mathbf{X}$  is represented by an  $m \times n$  matrix, where the column vector  $\mathbf{n}$  represents different indicators and the row vector  $\mathbf{m}$  represents different samples.

$$\mathbf{X} = \begin{bmatrix} x_{11} & \cdots & x_{1n} \\ \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mn} \end{bmatrix} \quad (1)$$

Standardize  $\mathbf{X}$  to obtain the new matrix  $\mathbf{Y}$ .

$$\bar{x}_j = \frac{\sum_{i=1}^m x_{ij}}{m}, \quad \sigma_j = \sqrt{\frac{\sum_{i=1}^m (x_{ij} - \bar{x}_j)^2}{m}}, \quad y_{ij} = \frac{x_{ij} - \bar{x}_j}{\sigma_j} \quad (2)$$

And calculate the correlation coefficient matrix  $\mathbf{R}$ , which reflects the correlation between different indicators.

$$\mathbf{R} = \mathbf{Y}^T \mathbf{Y} = \begin{bmatrix} r_{11} & \cdots & r_{1n} \\ \vdots & \ddots & \vdots \\ r_{m1} & \cdots & r_{mn} \end{bmatrix} \quad (3)$$

By calculating the  $n$  eigenvalues ( $\lambda$ ) and corresponding eigenvectors ( $\mu$ ) of the  $\mathbf{R}$  matrix, we can obtain the factor loading matrix  $\mathbf{A}$ , which reflects the relationship between each independent factor and the original indicators.

$$\mathbf{A} = \begin{bmatrix} \mu_{11}\sqrt{\lambda_1} & \cdots & \mu_{1n}\sqrt{\lambda_n} \\ \vdots & \ddots & \vdots \\ \mu_{m1}\sqrt{\lambda_1} & \cdots & \mu_{mn}\sqrt{\lambda_n} \end{bmatrix} = \begin{bmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{bmatrix} \quad (4)$$

To obtain the orthogonalized matrix, multiply the original variable matrix  $\mathbf{X}$  by the factor loading matrix.

$$\text{Factor} = \mathbf{X}\mathbf{A} \quad (5)$$

Each column of the resulting matrix represents mutually independent factors.

## 2.3 Logistic Regression

This study applies the logistic regression model proposed by Cox (1962) <sup>[2]</sup>, with the final factors obtained from the factor analysis as independent variables, and the overall satisfaction level of residents as the dependent variable. The specific regression model is as follows, where  $\mathbf{X}$  represents the obtained factors.

$$P = \frac{\exp(F)}{1+\exp(F)}, F = \beta_0 + \beta_1 X_1 + \dots + \beta_k X_k \quad (6)$$

After we use the factor analysis method to obtain the factors, we can take each factor as the explanatory variable  $X$  in the formula (6), and divide the overall satisfaction of residents into "satisfaction" and "dissatisfaction" according to the questionnaire as the explained variables in the above formula.

### 3 EMPIRICAL ANALYSIS

After the data cleaning of the collected questionnaires, this paper conducted Bartlett's test and the KMO test to determine if the data was suitable for factor analysis. According to Table 1, the KMO test value for the data is 0.867, which is close to 1, and the Bartlett's test is significant at a 99% level, indicating that the data is highly suitable for conducting factor analysis.

**Table 1.** KMO test and Bartlett's test

	KMO	0.867
Bartlett's	Chi-Square	3835.666***
	DF	312
	P-Value	0.000

After applying factor analysis for dimension reduction, three factors were selected. These factors account for a cumulative variance contribution rate of 76.34%. The rotated component matrix resulting from the rotation process can be found in Table 2. The first factor, named "Implementation of Common Prosperity Policy", primarily reflects satisfaction with policies related to common prosperity, including happiness index, democratic rights, wealth gap, living environment, and recreational activities. The second factor, named "Economic Development", reflects satisfaction with internet finance and income level. And the third factor, named "Convenience in Daily Life", reflects satisfaction with convenience in borrowing, payment, and the development of mutual benefit networks.

**Table 2.** Rotated Component Matrix

Variables	F1	F2	F3
happiness index	0.831	0.217	0.477
democratic rights	0.816	0.266	0.542
wealth gap	0.804	0.108	0.208
living environment	0.798	0.308	0.311
cultural and entertainment activities	0.722	0.333	0.538
internet-based financial services	0.238	0.887	0.430
income level	0.230	0.863	0.367
ease of borrowing and lending	0.467	0.503	0.897
convenience of payments	0.577	0.454	0.763
internet development	0.592	0.415	0.667

After obtaining the three major factors, logistic regression was conducted with the factors as independent variables and overall satisfaction of residents as the dependent variable. The results are presented in Table 3. From the regression equation, it can be observed that the regression coefficient for the "Implementation of Common Prosperity Policy" factor on overall satisfaction is 0.299. This implies that for every 1 unit increase in this factor, overall satisfaction, on average, increases by 0.299 units. The regression coefficient for the "Economic Development" factor on overall satisfaction is 0.389, indicating that for every 1 unit increase in this factor, overall satisfaction, on average, increases by 0.389 units. The regression coefficient for the "Convenience in Daily Life" factor on overall satisfaction is 0.502, which is the largest coefficient. This suggests that for every 1 unit increase in this factor, overall satisfaction, on average, increases by 0.502 units. This indicates that compared to the "Implementation of Common Prosperity Policy" and "Economic Development" factors, the impact of the "Convenience in Daily Life" factor on overall satisfaction is more pronounced.

**Table 3.** Logistic Regression Result

Variables	Beta	t
F1	0.299***	107.263
F2	0.402***	6.733
F3	0.520***	9.045
Cons	3.465***	11.246

Empirical evidence suggests that, to improve people's satisfaction, we are more inclined to focus on factors such as internet development and convenient payment methods, rather than improving aspects like internet finance. Our explanation for this is that some individuals still harbor a sense of mistrust towards internet finance. Even among those who participate in internet finance, the proportion of people who actually benefit from it is relatively small. Enhancing satisfaction with internet finance depends not only on the development of digital finance itself but also on individuals' financial capabilities and investment strategies. Both of these aspects are difficult to significantly improve in the short term in the field of internet finance. On the other hand, factors like internet development and convenience in payment are more closely related to people's daily lives and can be readily adopted and integrated into their routines.

Therefore, on the road of common prosperity, digital finance can promote high-quality economic development, and its main realization paths can be summarized into three aspects: technological innovation, industrial upgrading and wealth growth. People have been satisfied with the convenience of payment. What is needed now is to develop digital finance relying on financial technologies such as 5G, AIOT (Artificial Intelligence Internet of Things), artificial intelligence, cloud computing, blockchain and big data. Digital finance can effectively match the financial needs of large, medium and small enterprises and individuals across time and space, optimize the resource allocation of each enterprise and individual, and optimize the allocation of factor resources through financial technology, which directly promotes the upgrading of industrial structure. In addition, digital finance breaks through the limitations of physical space outlets and

personnel service time, and provides financial services anytime and anywhere, which has far-reaching significance for the realization of common prosperity.

## 4 CONCLUSIONS

This article analyzes various factors that influence the promotion of inclusive prosperity through digital finance. By using factor analysis, three major factors were identified and integrated. Logistic regression was then conducted with these factors, using overall satisfaction of residents as the dependent variable. The results suggest that, compared to factors such as improving internet finance, we are more inclined to focus on enhancing internet development and convenient payment methods. And this paper puts forward that there are mainly three paths to achieve it: technological innovation, industrial upgrading and wealth growth, and thinks that whether financial services can be provided anytime and anywhere is of far-reaching significance for achieving common prosperity.

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