

Study on the Coupled Dynamic Evolution of Social Entrepreneurship and Rural Labor Return in the Context of Rural Revitalization

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Abstract. Based on the panel data of social entrepreneurship and rural labor force return in 31 provinces and municipalities in China from 2016-2021, this paper constructs the evaluation system of entrepreneurial activity from the perspective of rural revitalization, and empirically analyzes it by using entropy weighting method, coupled coordination degree model, and relative development degree model to explore the development level of the two elements. The results show that: at the time level, the return of rural labor force and social entrepreneurship activity in 31 provinces in China from 2016 to 2021 tend to develop in a generally coordinated manner, and the level of coordinated development of the two factors fluctuates and rises; the degree of coupling and coordination of the two factors in general shows a "W"-type cyclical fluctuation characteristic.

Keywords: Rural Revitalization; Social Entrepreneurship; Labor Force Return; Coupled Coordination.

1. Introduction

In building a moderately prosperous society and a strong modern socialist country, the most arduous and burdensome tasks lie in the countryside, the broadest and deepest foundations lie in the countryside, and the greatest potential and strength also lie in the countryside [1]. In this context, the national rural revitalization work is imminent, but the lack of talent limits rural development. With the continuous enrichment of entrepreneurial practices in China's rural areas, there is an urgent need to build a framework for organizing data on the interactions between entrepreneurship and population mobility in rural societies, as well as a theoretical research framework that is consistent with China's development path in the new era [2]. In order to accelerate the construction of the data organization of the interaction between entrepreneurship and population mobility in the rural society and the theoretical research framework in line with China's development path in the context of the new era, so as to meet the development needs of the continuous enrichment of entrepreneurial practice in China's rural areas [3].

2. Indicator System, Data Sources and Research Methodology

2.1. Indicator System

2.1.1. Evaluation System Construction of Entrepreneurial Activity based on the Perspective of Rural Revitalization

Social entrepreneurship is a new form of entrepreneurship that emphasizes social responsibility and sustainable development and aims to solve social problems and improve social conditions. The essence of social entrepreneurship is to promote social progress by commercial means and realize social value through innovation and collaboration [4].

The indicator system in the following table is constructed from four latitudes: government support, talent innovation level, social entrepreneurship environment and economic development level. The



entropy weight method is used to measure the activity of social entrepreneurship, and the coupling and coordination analysis is carried out [5].

Table 1. Indicator system of social entrepreneurial activity

Latitude	First-level indicators
Strength of government support	R&D funding
	Share of government funding in R&D expenditure
Talent innovation level	Share of R&D personnel in labor force
	Number of new 10,000 people with tertiary education or above each year
Social entrepreneurial environment	Consumer price index
	Engel's coefficient
Level of economic development	Provincial and Municipal GDP per capita
	Share of value added of secondary industry in regional GDP
	Share of value added of tertiary industry in regional GDP

2.1.2. Rural Labor Force Return Indicator System Construction

The metrics of labor force are used are largely consistent, i.e., the product of the total population at the end of the current year minus the total population at the end of the previous year minus the total population at the end of the previous year minus the total population at the end of the previous year and the natural growth rate of the population in the current year.

2.2. Sample Selection and Data Sources

This paper uses data from 31 provinces and cities in China (excluding Hong Kong, Macao and Taiwan) from 2016-2021 as the sample. The data on social entrepreneurial activity is from, and the data on rural labor force return is from the China Statistical Yearbook.

2.3. Research Methods

2.3.1. Selection of Evaluation Method

Entropy weight method is based on the degree of variation of each indicator value to determine the weights of the indicators, which is an important method of objective evaluation, compared with other subjective assignment methods, can avoid the bias caused by subjective factors. This paper borrows the entropy weight method to evaluate the social entrepreneurship index.

2.3.2. Using Entropy Weight Method to Determine the Weights

- (1) Determine the indicators. Specific indicators are shown in Table 1.
- (2) Normalization of indicators.

$$X_{ij} = \frac{X_{ij} - \min\{X_{1j}, \dots, X_{nj}\}}{\max\{X_{1j}, \dots, X_{nj}\} - \min\{X_{1j}, \dots, X_{nj}\}} \quad (1)$$

Because the indicators selected in this paper are all positive indicators, it refers to the data preprocessing method above.

- (3) Calculate the weight of the *i*th sample value under the *j*th indicator for that indicator.

$$P_{ij} = \frac{X_{ij}}{\sum_{i=1}^n X_{ij}} \quad (2)$$

- (4) Calculate the entropy value of the *j*th indicator.

$$e_j = -k \sum_{i=1}^n p_{ij} \ln(p_{ij}) \quad (3)$$

(5) Calculate the information entropy redundancy.

$$d_j = 1 - e_j \quad (4)$$

(6) Calculate the weight of each indicator.

$$w_j = \frac{d_j}{\sum_{j=1}^m d_j} \quad (5)$$

(7) Calculate the composite score of each sample.

$$s_i = \sum_{j=1}^m w_j p_{ij} \quad (6)$$

Table 2 shows the corresponding weights of each indicator calculated using the entropy weight method.

Table 2. Weights of indicators in entropy weighting method

Indicator layer	Weight %
R&D funding	20.696
Share of government funding in R&D expenditure	14.657
Share of R&D personnel in labor force	16.361
Number of new 10,000 people with tertiary education or above each year	8.975
Consumer price index	6.435
Engel's coefficient	3.977
Provincial and Municipal GDP per capita	12.97
Share of value added of secondary industry in regional GDP	2.962
Share of value added of tertiary industry in regional GDP	12.967

2.3.3. Coupling Coordination Model

In order to study the relationship between the mutual influence of the two systems of social entrepreneurship and rural labor force return, this paper constructs the coupled coordination degree model of social entrepreneurship and rural labor force return with the following formula:

$$C = \sqrt{(U_1 U_2) / (U_1 + U_2)} \quad (7)$$

$$T = aX_1 + bX_2 \quad (8)$$

$$D = \sqrt{C \times T} \quad (9)$$

where C, T and D represent the degree of coupling, coupling coordinative degree, and coordination index of U_1 and U_2 , respectively. U_1 represents the social entrepreneurship index, and U_2 represents the rural labor force return index; a and b refer to the weights of the social entrepreneurship index and the rural labor force return index, respectively, and the sum of the two is one, X_1 represents the initial value of the social entrepreneurship index, and X_2 represents the initial value of the rural labor force return index. This paper considers that there is a mutual influence and interaction between social entrepreneurship and rural labor force return, i.e., the degree of importance is the same, so both a and b are set to 0.5.

3. Analysis of the Time-Series Coupling and Coordination of Social Entrepreneurship and Rural Labor Force Return

From the perspective of time dynamic evolution, the coupling coordination degree of social entrepreneurship and rural labor force return in China from 2016 to 2021 shows a trend from "disorder" to "coordination" development, the level of coordinated development of the two elements fluctuates and rises, and the average annual coupling coordination degree increases by 0.006475, showing a slow upward trend. 0.006475, showing a slow upward trend. This indicates that in recent years, China has continuously promoted the strategy of rural revitalization, and the implementation of the policy has improved the rural business environment, especially increased investment in rural areas, increased investment in networks, education, transportation, etc., which has fundamentally upgraded the level of infrastructure, and greatly contributed to the growth of the return of the rural labor force. Gradually, it is moving from a period of recovery after the epidemic to a period of sustained growth and development. Social capital support brought by social entrepreneurship to rural areas has promoted regional development, policy guidance and financial support have provided tools for rural economic development, and social entrepreneurship and rural labor force return have initially formed an endogenous momentum of synergistic development.

4. Analysis of the Spatial Evolution of the Coupling Coordination Degree

The rapid development and high level of coupling coordination in the eastern region is due to the fact that the rural infrastructure in the eastern region is more complete, the agricultural industry chain is relatively long, and the level of digitalization is high. In addition, the policy support brought about by the strategy of rural revitalization can effectively increase the employment and entrepreneurship opportunities of the local farmers, and drive the growth of farmers' incomes, which attracts the return of excellent talents to their hometowns and promotes the process of the return of the rural labor force, thus improving the social entrepreneurship and the return of rural labor force. Social entrepreneurship and the return of rural labor force to improve, and promote the integration and coordinated development of the two.

5. Conclusion

Based on the data of social entrepreneurship activity and rural labor force return index of 31 provinces and cities in China from 2016 to 2021, this paper empirically analyzes the coupling coordination model. The results of the study show that there are significant differences in the coupling and coordination status of provinces, and the coupling and coordination degree of labor force return and entrepreneurship activity between 2016 and 2021 shows a "W"-shaped cyclical fluctuation, with a larger gap between the eastern and central and western regions. Therefore, the government and social forces should strengthen the development planning of social entrepreneurship, use policy tilting, reasonable guidance and other ways to promote the balanced allocation and flow of social resources, according to the coupling and coordination of social entrepreneurship and rural labor force return to the rational layout of resource allocation, in order to achieve the balance of supply and demand in regional development, enhance the activity of social entrepreneurship, and promote the development of rural economy.

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