

# Based on the Coupling Model of the Rural Revitalization and the Urban Old-age Care

-- Take Anhui Province as an Example

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**Abstract:** With the development of society, the core problem of the elderly care in China has changed from solving poverty and material scarcity to how to meet the spiritual needs of the elderly. Under the social background of the timely completion of poverty alleviation goals and tasks in the new era, the construction of a "win-win" mechanism for urban elderly care and rural revitalization, the use of the environmental advantages of beautiful villages and idle housing, help urban elderly care, while giving play to the intellectual advantages and knowledge and skills of urban elderly, add wings to rural revitalization, not only help solve the talent bottleneck of rural revitalization, Moreover, it can meet the high-level spiritual needs of the elderly such as self-realization and achieve the purpose of quality old-age care. Therefore, promoting the combination of rural areas and urban elderly care is one of the important ways of rural revitalization.

**Keywords:** Elderly care, rural revitalization, rural interactive pension coupling system.

## 1. Introduction

The rural revitalization strategy is a major decision-making deployment to realize China's agricultural and rural modernization in the new development stage. In the coming period of time, the work of "agriculture, countryside and farmers" should comprehensively promote the revitalization of villages, basically realize agricultural modernization by 2035, and build an agricultural power by the middle of this century. In the new era and new journey, we plan and promote the work of "agriculture, countryside and farmers" scientifically. We should focus on comprehensively promoting the revitalization of the countryside, so as to comprehensively promote the revitalization of the countryside and promote the modernization of our country.

According to the data from the National Bureau of Statistics, China has entered a moderately aging society in an all-round way, and the number of elderly population is still growing rapidly. With the growth of age, the social circle of the elderly may gradually shrink. They may lack communication and interaction with their peers and close relationship with family and friends, which leads to loneliness and loss. They may feel neglected or useless and lack opportunities to participate in social activities and realize their values. This lack of belonging may lead to a decrease in self-esteem and self-worth of the elderly. They need not only basic life care and medical services, but also higher-level needs such as cultural entertainment and spiritual consolation.

There are many challenges in providing care, medical care, psychological and social support in the traditional way of providing for the aged, such as single service content, unstable service quality and high service cost. Therefore, it is extremely urgent to explore new ways of providing for the aged in order to meet the needs of the urban elderly and improve their quality of life and happiness.

In order to meet this challenge, we need innovative thinking and explore diversified ways of providing for the

aged. This may include the development of new pension models such as smart pension, mutual pension and joint pension, the use of modern scientific and technological means to improve the efficiency and quality of pension services, and at the same time to promote communication and interaction among the elderly, and to enhance their sense of social belonging and self-worth. In addition, we also need to strengthen policy support and investment, improve the pension service system, improve the quality and ability of service personnel, and provide more comprehensive and high-quality pension services for the elderly.

In a word, exploring a new way of providing for the aged has become an urgent task of the current urban old-age service. We need the joint efforts of the whole society, innovative ideas, perfect policies, improve service quality, and create a better old age for the urban elderly.

## 2. Deconstruction Mechanism of Urban and Rural Old-age Care Service in Anhui Province

### 2.1. Rural revitalization system dimension deconstruction and dynamic mechanism

According to the general requirements of the rural revitalization strategy, this paper divides the rural revitalization system into five components: prosperous industry, livable ecology, civilized rural style, effective governance and rich life.

"Prosperity of industry" is not only the premise to solve all the problems in the countryside, but also the economic foundation to rejuvenate the countryside. Only when the industry is prosperous can the steady growth of farmers' income be ensured so that more resources can be invested in education, medical care, culture and other fields, thus promoting the all-round development of the rural society. "Ecological and livable" is the basis for realizing the

sustainable development of villages. With the advancement of the integration of urban and rural areas, people's yearning for a better life and their pursuit of a beautiful ecological environment are increasing day by day. "Rural Civilization" is the driving force to promote the spiritual civilization of farmers. Through strengthening the construction of public service facilities such as education, culture and sports in rural areas, we will carry out rich and colorful rural cultural activities, cultivate farmers' civilized habits and sense of social responsibility, stimulate farmers' endogenous motivation and promote farmers' all-round development. "Effective governance" requires Party organizations to play a leading role in rural work. By strengthening the construction of grass-roots party organizations, promoting villagers' autonomy, deepening rural reform and other measures, to ensure the effective implementation of the party's policies in rural areas and the full protection of the legitimate rights and interests of farmers, living in prosperity is to enable farmers to have a sustainable and stable source of income, a comfortable economy, food and clothing, convenient living and common prosperity. It is an important task to implement the rural revitalization strategy to build a beautiful and livable rural environment. The "Five Requirements" are mutually integrated and organically unified, which together constitute the basic framework and internal logic for the implementation of the village revitalization strategy.

## **2.2. The urban and rural pension system dimension deconstruction and dynamic mechanism**

In this paper, the city pension is divided into four dimensions: demand, resource base, security system and intelligent empowerment.

In terms of demand, the demand of urban pension system is mainly reflected in the number, structure and distribution of the elderly population and the types and levels of demand for pension services. With the acceleration of urbanization and the aging of the population, the number of elderly population in cities is increasing and the structure is becoming more and more complicated. The demand for pension services has developed from basic daily life and physical health to spiritual needs. At the same time, with the increase of the elderly population, higher requirements are put forward for the quality and efficiency of pension services. The resource base of the urban pension system includes pension service facilities, human resources, capital, etc. Pension service facilities are the basic requirements for providing pension services, and human resources are the important support for pension services, including professional nursing staff, doctors, social workers, etc. Capital is the guarantee for the development of pension services, including government investment, social donations, personal savings, etc.

At present, the resource base of the urban pension system is still inadequate, such as shortage of facilities, lack of human resources, lack of funds and other issues. Therefore, the resource base is taken as a dimension of the research.

Regarding the security system, the security system of the urban old-age system includes policies and regulations, social welfare, etc. Policies and regulations are the guidelines and norms for the development of pension services, including pension service standards and management measures for pension institutions.

Intelligent empowerment is an important trend and direction for the development of urban pension system. Through modern scientific and technological means to improve the efficiency and quality of pension services, to meet the diversified and personalized service needs of the elderly, while the number of agricultural scientific and technological activities is also an important manifestation of wisdom and empowerment. At present, there are still some challenges in the smart empowerment of the urban pension system, such as the technology is not widely applied, the data sharing is hindered, and the talent reserve is insufficient. To sum up, the demand situation of the urban pension system is increasingly complex and diversified, and the resource base is still insufficient. The security system needs to be further improved. Wisdom and empowerment are the development trend in the future.

## **2.3. The formation of the rural revitalization-urban and rural interactive pension coupling system and the analysis of its mechanism**

There is a close coupling relationship between rural revitalization and urban-rural interactive pension, forming a system of mutual promotion and coordinated development. By optimizing the allocation of resources, the sharing and rational allocation of urban and rural resources can be realized, and the utilization efficiency of resources can be improved. For example, villages can provide abundant agricultural products and labor resources, and provide necessary material and human support for cities; Cities can help rural areas to develop their economies and raise the level of agricultural production by means of technology transfer and financial support. And the urban and rural pension services have common goals and needs. Through the integration of urban and rural pension service resources, the coordinated development of urban and rural pension services can be achieved. For example, cities can provide telemedicine, emergency rescue and other services for the rural elderly to help them solve practical problems in their lives; The rural areas can give full play to their regional advantages and provide distinctive and personalized pension services.

To sum up, the implementation of the rural revitalization-urban pension coupling system can realize the sharing and optimal allocation of urban and rural resources, promote the coordinated development of urban and rural economy and the harmonious coexistence of society, and provide more powerful support and guarantee for the rural revitalization and urban pension. The virtuous circle of this relationship will help realize the coordinated development of urban and rural areas and improve the well-being of the whole society.

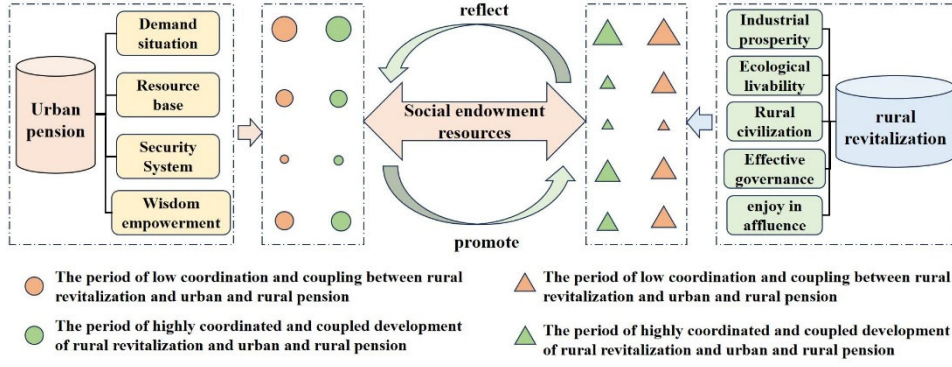


Figure 1. Rural revitalization-urban pension coupling system diagram

### 3. Empirical Research

#### 3.1. Overview of Research Areas

In the Yangtze River Delta region, Anhui Province, the province with the largest rural population, for example, the urban and rural pension system is a social development area with increasing attention in the region. With the continuous advancement of the aging process, it has become a top priority to build a comprehensive and diversified urban and rural pension system. As far as the urban pension system is concerned, Hefei, the capital of Anhui Province, and other major cities have various pension facilities, including nursing homes, community pension centers and rehabilitation institutions. However, in rural areas, the pension system is relatively weak. Due to the limitation of resources and economic development, pension facilities and services are relatively scarce in rural areas. Most of the elderly in rural areas mainly rely on the mutual help of their families and neighbors to spend their twilight years. However, this approach has gradually become difficult to meet the diversified needs of the elderly. In recent years, the Anhui provincial government has realized the problem of unbalanced development of the urban and rural old-age care system and started to increase the investment in the rural old-age care. The government has issued a series of policies to promote the development of rural pension services.

The urban and rural old-age pension system in Anhui Province shows a gap between urban and rural areas. However, with the promotion of government policies and the participation of social forces, Anhui's urban and rural pension system is developing towards a more balanced and perfect direction. This provides an opportunity and a challenge for us to study the coordinated development of rural revitalization and urban old-age care based on the coupling model.

#### 3.2. Research Methods

##### 3.2.1. Index System and Systematic Comprehensive Evaluation Model

The coupling system of rural revitalization and urban-rural interactive pension is divided into two systems: rural revitalization and urban-rural interactive pension. The rural revitalization strategy can be subdivided into five key areas, namely, industrial prosperity, beautiful and livable environment, advanced social culture, efficient governance and well-off public economy. These five pillars constitute the first-level criteria for evaluating the progress of rural revitalization. After in-depth study of the national standard of "beautiful countryside Construction Guide" and combined with successful cases in many regions, we carefully selected 18 specific secondary indicators, which are based on strict

screening criteria of scientific nature, targeted objectives and practical feasibility, aiming to comprehensively and accurately reflect various aspects of rural revitalization. (See Table 3).

Table 1 shows that the secondary evaluation index of the rural revitalization system:  $x_1, x_2, \dots, x_{18}$  describes the characteristics of the rural revitalization system. Secondary evaluation index of urban-rural interactive pension system:  $y_1, y_2, \dots, y_7$  describes the characteristics of urban-rural interactive pension system.

##### 3.2.2. Entropy Method

(1) Since all the indicators in the indicator system are positive, the range normalization method can be used to standardize the data of 25 indicators. The calculation formulas of the two systems are as follows:

$$q_i = (x_i - x_{\min}) / (x_{\max} - x_{\min}) \quad (1)$$

$$f_i = (y_i - y_{\min}) / (y_{\max} - y_{\min}) \quad (2)$$

Where is the standardized value of indicator  $q_i$  under the village revitalization system, the value of indicator  $x_i$ , the maximum value of indicator  $x_{\max}$  and the minimum value of indicator  $x_{\min}$ .

(2) After the data is standardized, the entropy weight method is used to calculate the weight of each index. The calculation formula is as follows:

Proportion of indicator value under indicator  $P_i$ :

$$P_i = X_i / \sum_{i=1}^n X_i \quad P_i = Y_i / \sum_{i=1}^n Y_i \quad (3)$$

Entropy value of index j:  $e_j$ :

$$e_j = -\frac{1}{\ln n} \sum_{i=1}^n P_i \ln P_i \quad (4)$$

Weight of indicator j:  $W_j$ :

$$W_j = \frac{(1 - e_j)}{\sum_{i=1}^n (1 - e_j)} \quad (5)$$

### 3.2.3. Construction of Evaluation Model

If a comprehensive evaluation function is set up for the rural revitalization system

$$N(x) = n(x_1, x_2, \dots, x_{18}) \quad (6)$$

The comprehensive evaluation function of rural revitalization system can be

$$N(x) = \sum_{i=1}^{18} a_i x_i \quad (7)$$

If it is set as the comprehensive evaluation function of the urban-rural interactive pension system, it can be obtained as follows:

$$M(y) = \sum_{i=1}^7 b_i y_i \quad (8)$$

Where  $a_i, b_i$  are the weight of the corresponding index, the comprehensive evaluation function calculates the comprehensive level of the corresponding system development represented by the result value, which is called the comprehensive evaluation index in this paper.

**Table 1.** Evaluation Index System of Rural Revitalization-Urban-Rural Interactive Pension System

Coupling subsystem	Level indicators	Secondary indicators	Indicator weight
rural revitalization	The industry is thriving.	Per capita primary industry output value (billion yuan)	0.0792651
		Ln food production (kg/ha)	0.0132621
		Ln Agricultural Machinery Total Power (MW)	0.0661486
		Ln Effective Irrigation Area (1000 Ha)	0.0664204
	Ecological livability	Forest cover (%)	0.1395423
		Non-hazardous Disposal Rate of Domestic Waste (%)	0.0129286
		Ln number of public toilets (seats)	0.0630788
		Number of village doctors and health workers (10,000)	0.1297093
		Ln Water Supply Comprehensive Production Capacity (10,000 m <sup>3</sup> /day)	0.0594628
		Ln Local Finance Expenditure on Education (Billion Yuan)	0.0314569
	Local culture	Illiterate population/population aged 15 years and over	0.0623357
		Comprehensive Population Coverage of TV Programs Rate (%)	0.0170722
		Effective governance	Per capita disposable income of rural residents/per capita disposable income of urban residents
	enjoy in affluence	Per capita consumption expenditure of rural residents/per capita consumption expenditure of urban residents	0.0340649
		Ln rural population (10,000)	0.0685541
		Ln per capita disposable income of rural residents Income (yuan)	0.0273071
		Ln rural individual employment Number (10,000)	0.0621603
	Demand situation	Urban-rural interactive pension	Number of Sojourners (10,000)
Resource base	Security System	Idle rural labor (young elderly/left-behind women)	0.1480927
Intellectual empowerment		Rural tourism resources (GDP/land/housing)	0.1412658
		Endowment insurance system	0.1498691
		Medical security system (number of beds, service personnel)	0.1459534

### 3.2.4. Coordination Degree Measurement Model

The rural revitalization-urban and rural interactive pension system shows a complicated nonlinear coupling relationship. Drawing on the model of coordinated development of economy and environment proposed by Liao Chongbin [7], the measurement formula of coordination degree between rural revitalization and urban-rural interaction can be expressed as follows:

$$C = \left\{ \frac{\frac{n(x)m(x)}{n(x)+m(x)}}{2} \right\}^2 \quad (9)$$

Where: C is the degree of coordination (or coordination coefficient); K is the adjustment coefficient so that  $K \geq 2$ .

Coordination degree C is a key indicator to measure the degree of close correlation between systems, which can reveal the degree of interaction between different systems. However, the coordination degree has limitations in reflecting the overall operation effect of the system and the synergistic effect of each part. In order to evaluate the coordination of the system more comprehensively, the dispersion model is widely constructed based on the principle of minimizing dispersion, and the degree of coordination among various parts of the system is evaluated through the model [7]. This method can help to judge whether the system is in good coordination state more accurately, and then provide guidance for optimizing the system performance. The formula is:

$$D = \sqrt{CT} \quad (10)$$

Among them:

$$T = \alpha \cdot N(x) + \beta \cdot M(x) \quad (11)$$

Where: D is called the degree of coordinated development;  $\alpha, \beta$  Is a coefficient to be determined. For two systems, usually take  $\alpha = 0.5$ ,  $\beta = 0.5$ . The level of coupling coordination mainly includes "four-point method", "six-point method", "seven-point method" and "ten-point method". In this paper, the widely used six-point method is adopted.

### 3.2.5. Coupling Evolution Model

The evolution of the rural revitalization-urban-rural interactive pension system is a complicated and nonlinear process. According to the general system theory, the evolution equation of the composite system can be expressed as follows:

$$N(x,t) = dN(x)/dt, M(y,t) = dM(y)/dt \quad (12)$$

$N(x,t), M(y,t)$  It is the evolution state of the composite system under the influence of itself and the outside world.

Order

$$V(x) = dN(x,t)/dt, V(y) = dM(y,t)/dt \quad (13)$$

Where:  $V(x), V(y)$  indicate the speed of change of the

rural revitalization and urban-rural interactive pension system respectively. Project the motion trajectory of to the same plane. For a point in time, the  $V(x), V(y)$  included angle of the curve tangent is  $\gamma$  (see Figure 2). Can be expressed as:

$$\tan \gamma = V(x)/V(y), \gamma = \arctan[V(x)/V(y)] \quad (14)$$

$\gamma$  It reflects the characteristics and differences between the changing trends of rural revitalization and urban-rural interactive pension system. This research method is called scissors method.

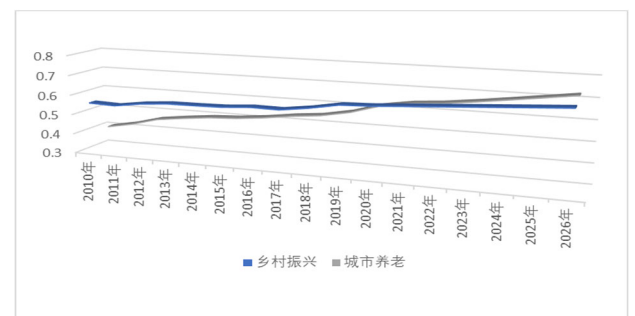
## 3.3. Results and Discussion

### 3.3.1. Data Sources and Pretreatment

We have systematically collected time series data of 25 key indicators that can reflect the development of rural revitalization and urban-rural interactive pension. These data cover the entire time span from 2010 to 2020. These valuable indicators are mainly derived from the authoritative China Statistical Yearbook, China Social Statistical Yearbook and China Fixed Assets Investment Statistical Yearbook published in the corresponding years. For a very small number of data points that are missing for various reasons, interpolation or smoothing methods are carefully used to make reasonable additions to ensure the continuity and accuracy of the data.

### 3.3.2. Coupling Degree and Coordinated Development Degree

The comprehensive evaluation functions of Formula (8) and Formula (9) respectively calculate the comprehensive evaluation indexes of the rural revitalization system and the urban-rural interactive pension system, and the time series curves are shown in Figure 3. As can be seen from fig. 3, the time series curves of rural revitalization and urban-rural interactive pension system in Anhui province are in an overall growth pattern.



**Figure 2.** Time Series Curve of Rural Revitalization and Urban-rural Interactive Pension System in Anhui Province

The curve of the urban-rural interactive pension system fluctuates slightly, with the time series variance of 0.244 and the average ring-on-ring growth rate of 2.434%, which reflects the sensitivity of the urban-rural interactive pension system. The rural revitalization curve grew steadily, with an average month-on-month growth rate of 3.204% and a variance of 0.323, which reflects that although the rural construction effect in Anhui Province has developed significantly, the rural revitalization system has not yet stabilized.

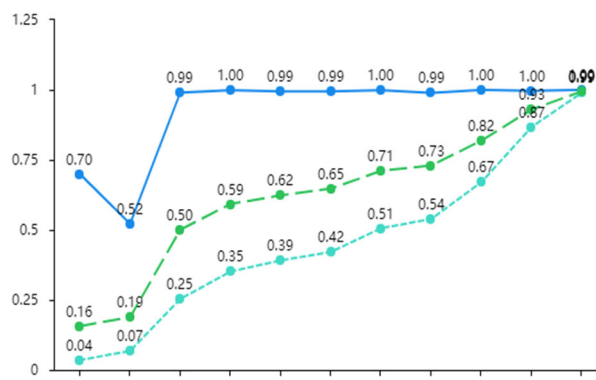
By using the formulas (9), (10) and (11), we calculated the

coordination degree between rural revitalization and urban-rural interactive pension system in Anhui Province and their development coordination degree. The specific results can be referred to Figure 3. It can be clearly seen from the figure that the overall value is maintained at a high level regardless of the coordination degree of the system or its development coordination degree. In particular, the development

coordination degree of the system, as a result of the comprehensive effect of the rural revitalization and the urban-rural interactive pension system, reveals how these two subsystems interact and coordinate with each other, and gradually evolves in this process. Therefore, on the whole, this degree of development coordination also presents a stable and continuous upward trend

**Table 2.** Calculation Results of Coupling Coordination Degree.

item	Coupling degree c value	Coordination index t value	Coupling coordination degree d value	Coordination level	Degree of coupling coordination
Item1	0.699	0.035	0.157	two	Severe disorder
Item 2	0.522	0.068	0.188	two	Severe disorder
Item 3	0.990	0.254	0.501	six	Grudgingly coordinated
Item 4	0.999	0.351	0.593	six	Grudgingly coordinated
Item 5	0.994	0.391	0.624	seven	Primary coordination
Item 6	0.994	0.422	0.647	seven	Primary coordination
Item 7	0.999	0.506	0.711	eight	Intermediate coordination
Item 8	0.989	0.539	0.730	eight	Intermediate coordination
Item 9	1.000	0.671	0.819	nine	Good coordination
Item 10	0.997	0.868	0.930	10	Quality coordination
Item 11	1.000	0.990	0.995	10	Quality coordination



**Figure 3.** item 1–item 11 represent the years 2010 -2020 in turn

According to Table 2, the grading standard of the development coordination degree of the coupling system, the coupling coordination process of the rural revitalization-urban-rural interactive pension system in Anhui Province can be divided into the following three stages (see Figure 3).

(1) Low coupling stage (before 2014). Before 2015, the development level of rural revitalization and urban-rural interactive pension system in Anhui Province is quite different. The pension system in urban areas is relatively perfect, while the pension conditions in rural areas are relatively poor. At this stage, there is an imbalance in the resources allocation between the rural revitalization and the urban-rural interactive pension system. The endowment resources in urban areas are relatively abundant, while those in rural areas are relatively scarce. This results in a low level of communication and coordination between the two systems.

(2) Medium coupling stage (2014-2017). At this stage, the tourism industry in Anhui Province developed rapidly, and more and more elderly people in cities learned about the old-age care model for rural residents. Both the rural revitalization and the urban-rural interactive pension system have shown a rapid growth momentum. However, in contrast, the progress of the relevant indicators of the rural revitalization system is slightly slow, and the coupling degree between the two is therefore showing a low level. At this stage, the two subsystems are in a period of mutual adaptation and

integration. According to the value of coordinated development degree, it is in the range of 0.5 to 0.8, which indicates that the two subsystems are at the stage of moderate coupling.

(3) High coupling stage (2018 to date). With the vigorous construction of rural areas and the increasingly perfect infrastructure, rural old-age care is loved by the majority of the elderly, and the indicators of both systems have maintained a steady growth trend. At this stage, the vigorous development of tourism has played a strong role in stimulating the county economy, effectively improving people's income level, and has achieved remarkable results in solving the employment problem. At the same time, the indicator curve of rural revitalization and urban-rural interactive pension also shows a rapid upward trend. The degree of coordinated development between the two has reached a high level, generally exceeding 0.8, indicating that they have entered a stage of highly coordinated coupling.

### 3.3.3. Rural Revitalization-Forecast of Urban-Rural Interactive Pension System

Model —ARIMA model (taking Anhui Province as an example)

1. Draw the timing chart

First, according to the calculated comprehensive score, the time is taken as the abscissa, and the comprehensive scores of rural revitalization and urban old-age care are taken as the

ordinate to draw the timing chart. Observe the trend and pattern of the timing chart to initially understand the changes.

### 2. Make a difference

By observing the timing chart, determine whether there are characteristics such as trend or seasonality. If a trend exists, first-order or second-order differences can be made to eliminate the effect of the trend and smooth the sequence. The formula of first-order difference:

$$\Delta X(t) = X(t) - X(t-1) \quad (15)$$

Where the value after the first-order difference is represented  $\Delta X(t)$ , the value of the original time series at time  $t$  is represented  $X(t)$ , and the value of the original time series at time  $t-1$  is represented  $X(t-1)$ .

Taking Anhui Province as an example to solve the problem, after performing the difference operation on the data series, the new series shows a fluctuating state near the value of 0, with no obvious trend characteristic. In order to further confirm the stationarity of the difference sequence, we performed the ADF(Augmented Dickey-Fuller) unit root test on it. The test results show that the P values of all ADF statistics of the difference sequence are less than the significance level of 0.05. This shows that the sequence after difference is stable statistically. Therefore, it can be determined that the series after the difference is stationary, so the series is non-stationary, but the series after the first-order difference is stationary.

### 3. White noise test

White noise test is performed on the difference sequence to ensure that the residual terms of the sequence are random and uncorrelated. Commonly used test methods include Ljung-Box test and Q-Q diagram, etc.

The pure randomness test is carried out on the sequence after the difference. According to the test results, the P values of the LB statistics of the 6th and 12th order delays are all less than the significance level ( $\alpha = 0.05$ ), so the sequence after the difference can be judged to be a stationary non-white noise sequence.

### 4. Determining parameters

Determining the order ( $p, d, q$ ) of the ARIMA model according to the autocorrelation graph (ACF) and the partial autocorrelation graph (PACF) of the sequence after the difference. Order  $P$  represents the order of the autoregressive term,  $D$  represents the number of differences, and  $Q$  represents the order of the moving average term [6].

### 5. Residual test

After fitting the ARIMA model, the residual error of the model is tested to ensure that the residual error conforms to the characteristics of white noise. If the residuals do not meet the requirements, you can try to adjust the model parameters or use another time series model.

### 6. Forecast composite score

Based on the established ARIMA model and available historical data, the comprehensive score forecast for the next 6 years is made. Using the prediction function provided by the model, input the required prediction period length to obtain the corresponding score prediction results. For the sequence after the first-order difference, the prediction formula is:

$$\Delta X(t+1) = c + \sum \alpha(i) * \Delta X(t-i+1) + \sum \rho(j) * E(t-j) + E(t+1) \quad (16)$$

Where,  $\Delta X(t+1)$  represents the sequence after first-order difference,  $\alpha(i)$  represents constant term,  $E(t)$  represents autoregressive term coefficient,  $\rho(j)$  represents white noise error, and represents moving average term coefficient.

Calling the forecast function to make a prediction, the predicted values of the rural revitalization and urban pension scores of Anhui Province from 2021 to 2026 can be obtained. Therefore, other provinces and so on.

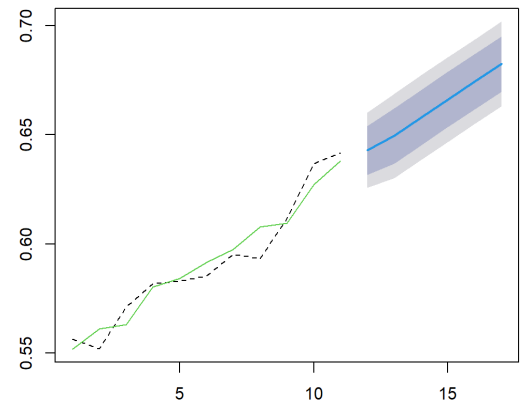


Figure 4. Forecast of Rural Revitalization Score in Anhui Province

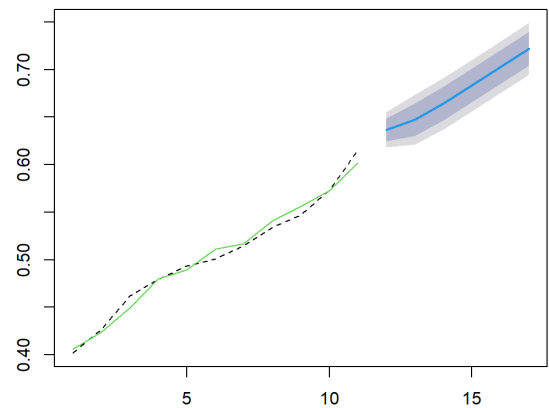


Figure 5. Forecast of Urban Endowment Score in Anhui Province

## 4. Conclusion and Discussion

This paper makes a detailed discussion on the components of the two systems of rural revitalization and urban-rural interactive pension and the driving forces behind them, and interprets the internal relations and interactive modes between them. The research reveals that there is a close interdependent relationship between rural revitalization and urban-rural interactive pension. This kind of dependency relationship is manifested through the interaction and response mechanism of the participants, thus constructing a compound system of rural revitalization and urban-rural interactive endowment. In this complex system, the rural revitalization and the urban-rural interactive pension are mutually causal and complementary, and jointly promote the continuous operation, gradual evolution and overall improvement of the system.

Selecting Anhui Province in the Yangtze River Delta region as a representative case of this study, we carefully constructed two sets of evaluation index systems, namely, rural revitalization and urban-rural interactive pension, which contain 18 and 7 specific secondary indicators respectively. Based on the panel data from 2010 to 2020, we calculated and analyzed the comprehensive evaluation index, coordination degree and coordinated development degree of the two systems. According to the different levels of coordinated development, we divide the integration process of rural revitalization and urban-rural interactive pension in Anhui Province into three stages: initial low coupling, moderate coordinated coupling and high integration coupling.

With the help of the case study of Anhui Province, we have successfully revealed the operation mechanism between the rural revitalization and the urban-rural interactive pension system and the laws of its development and changes. Research data show that there is a significant mutual promotion and common influence between rural revitalization and urban-rural interactive pension system in the process of gradual evolution.

By optimizing the allocation of resources, the sharing and rational allocation of urban and rural resources can be realized, and the utilization efficiency of resources can be improved. For example, villages can provide abundant agricultural products and labor resources, and provide necessary material and human support for cities; Cities can help rural areas to develop their economies and raise the level of agricultural production by means of technology transfer and financial support. And the urban and rural pension services have common goals and needs. Through the integration of urban and rural pension service resources, the coordinated development of urban and rural pension services can be achieved. For example, cities can provide telemedicine, emergency rescue and other services for the rural elderly to help them solve practical problems in their lives; The rural areas can give full play to their regional advantages and provide distinctive and personalized pension services.

To sum up, the implementation of the rural revitalization-

urban pension coupling system can realize the sharing and optimal allocation of urban and rural resources, promote the coordinated development of urban and rural economy and the harmonious coexistence of society, and provide more powerful support and guarantee for the rural revitalization and urban pension. The virtuous circle of this relationship will help realize the coordinated development of urban and rural areas and improve the well-being of the whole society.

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