

Comprehensive Evaluation of Social Security in Anhui Province

Yangyang Qian

School of Anhui University of Finance and Economics, Bengbu, 233000, China

Abstract

The article uses SPSS software to conduct empirical analysis of relevant data in 2018, and finds that the three public factors measuring the social security level in Anhui Province are the old-age and medical security factors, the education and housing security factors, and the living security factors, and put forward reasonable suggestions.

Keywords

Social Security; Factor Analysis; Cluster Analysis.

1. Introduction

1.1. Research Background

Social security is a kind of assistance provided by the government for the people to live normally when members of society encounter various risks, it is a powerful system for China's current poverty alleviation, and social protection is also an important part of the national "six batches" poverty alleviation key projects, which plays a decisive role in the comprehensive realization of a well-off society. There are certain differences in the designation and implementation of social security policies in various provinces, and the results of the implementation of social security systems are also different, this article will focus on Anhui Province, using reasonable indicators to quantify the operation of the social security system in Anhui Province.

1.2. Research Significance

As one of the representative provinces in the delta region, Anhui Province has great significance for the development level of its social security. At present, there are more scholars who study the comprehensive level of social security in China, and some scholars study the regional differences in the level of social security, but the comprehensive evaluation of social security in specific provinces, especially the research on social security in Anhui Province, is rare; this paper analyzes the current situation of social security in Anhui Province by consulting the relevant information of the social security level in Anhui Province, analyzing the relevant data, and conducting an in-depth analysis of the current situation of social security in Anhui Province, and presents it intuitively. This is conducive to the government and the masses to more easily understand the current level of social security in Anhui Province.

1.3. Research Methodology

First, combined with the literature review and data analysis method, this paper first analyzes the research status and research to be improved at home and abroad, and determines the research direction and ideas of this paper; at the same time, by consulting the statistical yearbook of Anhui Province from 2014 to 2019, we collate the various data required for the social security level and empirical research in Anhui Province.

Second, combining factor analysis and cluster analysis, this paper selects the data of 16 prefecture-level cities in Anhui Province in 2018, measures the factors of social security and their comprehensive levels in various regions using factor analysis method, and classifies 16

cities according to the factor scores into advantageous areas for old-age care and medical security, education and housing security advantages, and living security advantages.

2. Empirical Analysis of the Level of Social Security in Anhui Province

2.1. Selection of Evaluation Indicators

Different scholars have different evaluation indicators for the level of social security, this paper mainly draws on the evaluation index system of Zhou Ming and Zhang Xinwu (2014), and then combines the actual situation of various regions in Anhui Province to form 5 first-level indicators, which are divided into 11 second-level indicators of the evaluation index of the social security level in Anhui Province, and the specific indicators are as shown in Table 1. Because social security expenditure includes social insurance expenditure and financial security expenditure, social insurance expenditure mainly includes insurance expenditure at the four levels of pension, unemployment, medical care and maternity, and financial security expenditure mainly includes financial expenditure in social security and employment, medical care and family planning, and housing security, so this paper selects these seven variables to measure the level of social security; and because the minimum living security, the number of beds in medical institutions and the dependency ratio of the elderly are related to the content of life, medical care and old-age care. Therefore, the minimum subsistence guarantees per capita, the number of beds per 10,000 health care institutions and the dependency ratio of the elderly were selected as additional indicators to measure the level of social security.

Table 1. Evaluation indicators of social security level in various regions of Anhui Province

First-level indicator name	The name of the second-level indicator	Secondary indicator symbols
Social insurance expenditures	Pension insurance expenditure	X1
	Unemployment insurance expenditure	X2
	Medicare expenses	X3
	Maternity insurance expenses	X4
Fiscal security expenditure	Financial expenditure on education	X5
	Fiscal expenditure on social security and employment	X6
	Financial expenditure on medical care and family planning	X7
	Fiscal expenditure on housing security	X8
Living security	Minimum subsistence per capita	X9
Medical coverage	Number of beds per 10,000 people in health care facilities	X10
Pension burden	Elderly dependency ratio	X11

2.2. Evaluation Methods and Data Selection

According to the Anhui Provincial Statistical Yearbook, this paper selects the data of 16 regions in Anhui Province in 2018, uses the factor analysis method to summarize and sort out the above 12 indicators to obtain public factors, and then obtains the public factor score and comprehensive score of the social security level of each region, and then analyzes the clustering according to the score to obtain different types of social security areas. This paper mainly uses SPSS software for empirical analysis.

Because the data units of the selected indicators make the numerical values vary greatly, the data use the extremum processing method to obtain standard data. The data is processed as follows:

$$X_{ij} = (x_{ij} - m_j) / (M_j - m_j)$$

Where M_j is the maximum value in x_{ij} and m_j is the minimum value in x_{ij} .

2.3. Analysis of Empirical Results

The SPSS software was used to check the data of 16 regions in Anhui Province in 2018 and table 2 was obtained. As obtained from Table 2, the value of the KMO test is 0.683 greater than 0.5, and the P of bartlett test is less than 0.005. Therefore, the data selected in this article can be analyzed by factors.

Table 2. Bartlett spherical test results and KMO test results

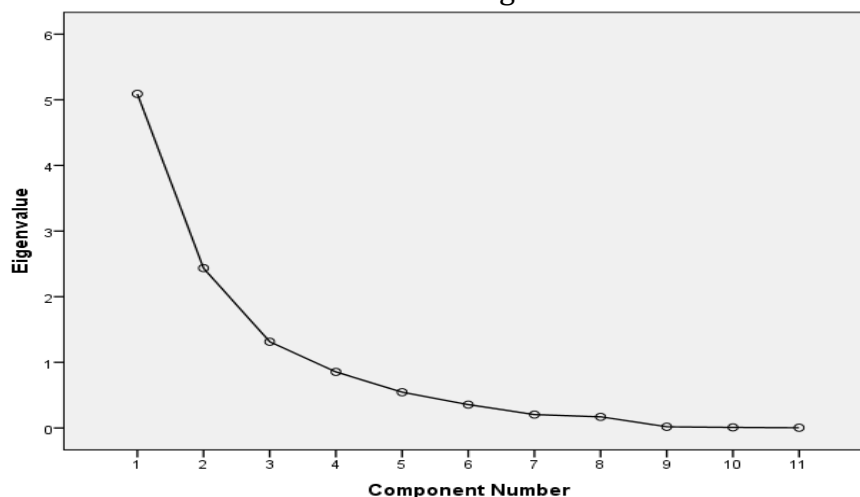
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.683
Bartlett's Test of Sphericity	Approx. Chi-Square	174.666
	df	55
	Sig.	.000

In this paper, SPSS software is used to analyze the factors of standardized data. The selection of the number of common factors is the default indicator of SPSS for analysis, and Table 3 is obtained, and the gravel chart 6 is obtained, according to which the lithotripsy chart gradually becomes smooth after the third factor, so it is most appropriate to take three common factors.

Table 3. Variance contribution rate

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.090	46.276	46.276	4.597	41.791	41.791
2	2.435	22.138	68.414	2.870	26.092	67.883
3	1.314	11.946	80.360	1.372	12.477	80.360

Table 4. Gravel diagram



The coefficients of the three common factors are obtained, as shown in Table 5. From Table 5, it can be seen that the three public factors of the public factor are F1, F2, F3 to indicate specifically, F1 mainly explains X1 - pension insurance expenditure, X2 - unemployment insurance expenditure, X4 - maternity insurance expenditure, X5 - education financial expenditure, X6 - social security and employment financial expenditure, X7 - medical and family planning financial expenditure, X8 - housing security financial expenditure, which shows that F1 represents the basic security factor, explaining more variables; F2 mainly explains X9 - per capita minimum living security, X10 - number of beds per 10,000 healthcare facilities, which

indicates that F2 represents the living security factor; F3 mainly explains X3 - health insurance expenditure, X11 - elderly dependency ratio, which indicates that F3 represents the medical security factor.

Table 5. Factor load matrix after rotation

	Component		
	1	2	3
X1	.960	.181	.102
X2	.695	.510	-.038
X3	.193	-.217	.715
X4	.576	.546	.262
X5	.974	-.142	.061
X6	.958	-.239	-.010
X7	.876	-.439	.041
X8	.679	-.502	-.170
X9	.085	.872	.283
X10	.308	.717	-.415
X11	-.345	.005	.661

As can be seen from Table 5, the three common factors of the common factor are represented by F1, F2, and F3 respectively, and the linear combination of the three common factors is as follows:

$$F1=0.960*X1+0.695*X2+0.193*X3+0.576*X4+0.974*X5+0.958*X6+0.876*X7+0.679*X8+0.085*X9+0.308*X10-0.345*X11;$$

$$F2=0.181*X1+0.510*X2-0.217*X3+0.546*X4-0.142*X5-0.239*X6-0.439*X7-0.502*X8+0.872*X9+0.717*X10+0.005*X11;$$

$$F3=0.102*X1-0.038*X2+0.715*X3+0.262*X4+0.061*X5-0.010*X6+0.041*X7-0.170*X8+0.283*X9-0.415*X10+0.661*X11$$

The sum of the scores of F1, F2 and F3 yields the total score F of each region in Anhui Province.

$$F= (41.791/80.360) *F1+(26.092/80.360) *F2+ (12.477/80.360) *F3$$

According to F1, F2, F3, F, the score and ranking of each region in Anhui Province, the top three social security levels in Anhui Province in 2018 are Wuhu City, Hefei City and Fuyang City; in terms of basic security factors, Hefei City, Fuyang City and Suzhou City have higher security levels; in terms of living security factors, Hefei City, Wuhu City and Bengbu City have higher security levels; in terms of medical security factors, Chuzhou City, Lu'an City and Ma'anshan City have higher security levels.

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