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Research on investment degree of social security construction in each district of Hefei City

Xia Junjie[1], Wang Jiake[2], Ling Ruichao[1]

[1]*School of Management of Science and Engineering, Anhui University of Finance and Economic, Bengbu 233030, China*
[2]*School of Accounting, Anhui University of Finance and Economic, Bengbu 233030, China*
[*]*Corresponding Author*

ABSTRACT. *This paper studies the investment degree of social security construction in each region of Hefei through three analytical methods. This paper first constructs an evaluation index system of financial input in social security construction, which includes 11 evaluation indexes. Then descriptive statistics and factor analysis are used to comprehensively evaluate the investment degree of social security construction in each district of Hefei city. The conclusion shows that there are obvious differences in the financial input of each district in Hefei, and the input of each district has the short board effect, so we should pay more attention to and strengthen the input of the overall social security construction of each district in the urban characteristic construction.*

KEYWORDS: *social security construction, Hefei city, descriptive statistical analysis, factor analysis, comprehensive evaluation*

1. Introduction

Social security construction is the construction of urban including social insurance, social assistance, social special care and social welfare, is an important reference factor to reflect people's living standard, and is a relatively comprehensive embodiment of the city's fiscal expenditure and benefits. Social security includes safety expenditure, transportation construction, cultural construction, health plan, etc. The investment degree of social security construction in a district can be used to measure the level of urbanization and people's livelihood in the district.

Domestic scholars (Zhang Xiaoxue, 2011; Elvis lee, 2019) for the use of information analysis method is very skilled, and are used for a wide range of economic environment, including technical absorption index and the relationship between the economic development, but the information analysis method used in small range area of evaluation is relatively rare, hefei as a special development,

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fiscal investment regional significant city, carry on the construction of social security degree of fiscal investment contact analysis is related with the city's economic development, have certain reference value.

2. Construction of a comprehensive evaluation system for the degree of investment in social security construction

The evaluation system of the degree of investment in social security construction is mainly selected according to the mainstream direction of financial expenditure in social security construction, namely, investment in education, medical care, public facilities, housing and employment. According to the above characteristics, the selected evaluation level is comprehensive, representative, concise and operable, so as to build the following expenditure level evaluation system.

Table 1 Comprehensive evaluation system of social security input degree

Degree of investment in social security construction	The construction level of regional public services:	X_1 Expenditure on general public services
		X_2 Urban and rural community expenditure
		X_3 Public safety expenditure
	Improving the people's livelihood in the region:	X_4 Expenditure on basic social security and employment
		X_5 Housing security index
		X_6 Spending on health and family planning
	Regional expenditure on science and education:	X_7 Education spending
		X_8 Expenditure on science and technology
	Regional soft power construction level:	X_9 Expenditure on energy conservation and environmental protection
		X_{10} Business services expenditure
		X_{11} Expenditure on culture,sports and media

3. Comprehensive evaluation of investment degree in social security construction

We mainly use the descriptive statistical analysis and cluster analysis on the financial input in Hefei district's mapped the box-plot briefly interpret and points out

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that in Hefei district appeared in some social security commitment of outliers, combined with the characteristic in Hefei development direction for urban classification and degree of fiscal investment analysis of the relationship. Then the factor analysis is used to comprehensively evaluate the social security construction investment degree of each district in Hefei city and the corresponding score is obtained to make the social security construction investment degree of each district visible and comparable.

3.1 Descriptive statistical analysis

In order to visually show the differences of financial investment in different security construction in each district of Hefei city, we took out the maximum, minimum and mean values of the financial investment in each district after descriptive statistics, and drew a histogram for the mean value of the total financial investment in each district. After the box-plot is drawn, the outliers in Hefei urban area are tested and combined with the cluster analysis diagram, the reasons for the difference in social security investment in Hefei urban area are briefly analyzed.

Tale 2 Descriptive statistics of variables

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
Min	8544	13863	5	198	1616	169	1839	655	165	224	171
Max	100167	248425	30643	123960	44985	93843	163229	274513	48144	12739	7219
Mean	45515	96315	13396	52354	12451	37946	102827	44163	13682	4578	3023

It can be seen from Table 2 that: among the 11 variables, 4 of the maximum values are the data of Feidong County, while the remaining maximum values are scattered in Baohe District, High-tech Zone, Economic development Zone, Feixi County and Lujiang County. Among the 11 variables, 6 of them are concentrated in Chaohu Jinkai Area, 3 in Yaohai Area, and 2 are scattered in high-tech zone and Xinchang area respectively. The investment degree of Luyang District, Shushan District, Changfeng County and Chaohu city was relatively average, and there was no extreme value in the descriptive statistics of evaluation level. From the perspective of the extreme difference of individual evaluation level, the difference between extreme value and extreme difference is unusually obvious, indicating that there is an obvious difference in the investment degree of social security construction among different regions in Hefei.

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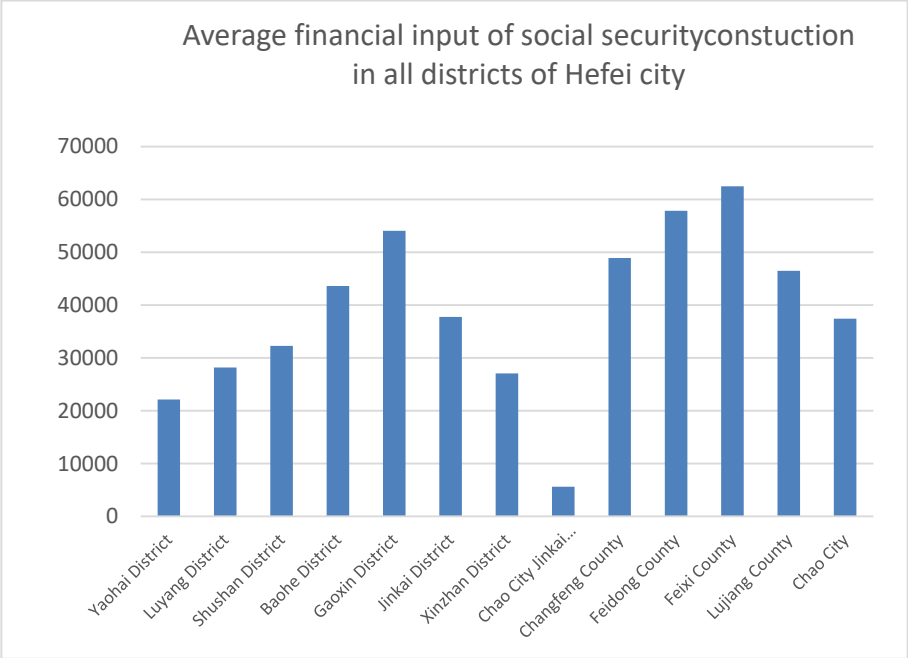

Fig.1 Histogram of mean value of each region in Hefei.

Figure 1 shows the intuitive selected in each region of Hefei 11 average evaluation level, can be seen from the table in the average input level has reached the maximum value of Feixi County, followed by Feidong and high-tech zone, the average investment of about 550 million, in the average minimum value for Chaohu City by the open area, degree of fiscal investment is less than 10% of Feixi county, 13 regional financial input in 056 million average in terminal.

It can be seen from the box chart of the financial investment amount of each district in Hefei that the social security investment in different aspects of each district is prominent. In terms of education expenditure, The five districts of Yaohai District, Luyang District, Shushan District, Baohe District and Xinzhan District are higher than other social security areas. In luyang District, Shushan District, High-tech Zone, Economic development Zone and Xinzhan District, the expenditure of urban and rural community construction is higher than other aspects of social security. In addition, high-tech zone, Economic development zone and Chaohu Economic Development Zone also have very high expenditure on science and technology. The high-tech zone's investment in science and technology has reached its peak.

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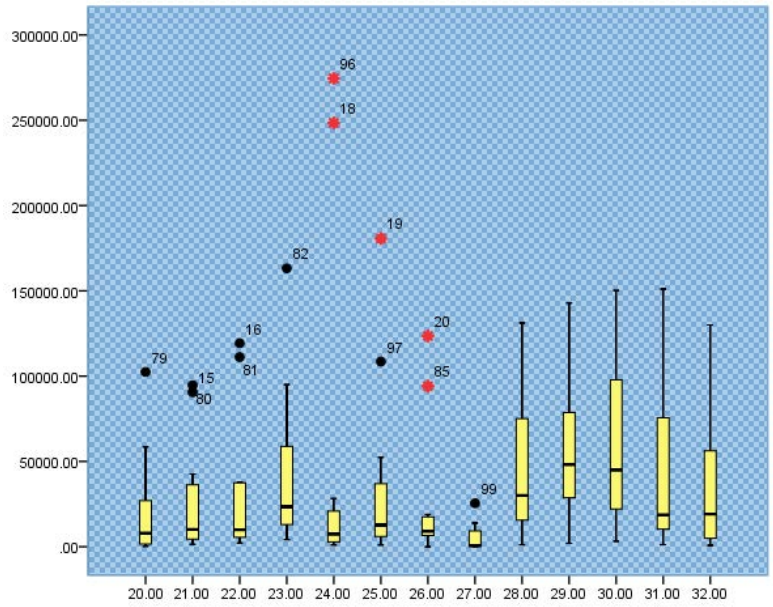

(The X-axis is the area code, and the Y-axis is the amount invested)

Fig. 2 Box-plot of each urban district

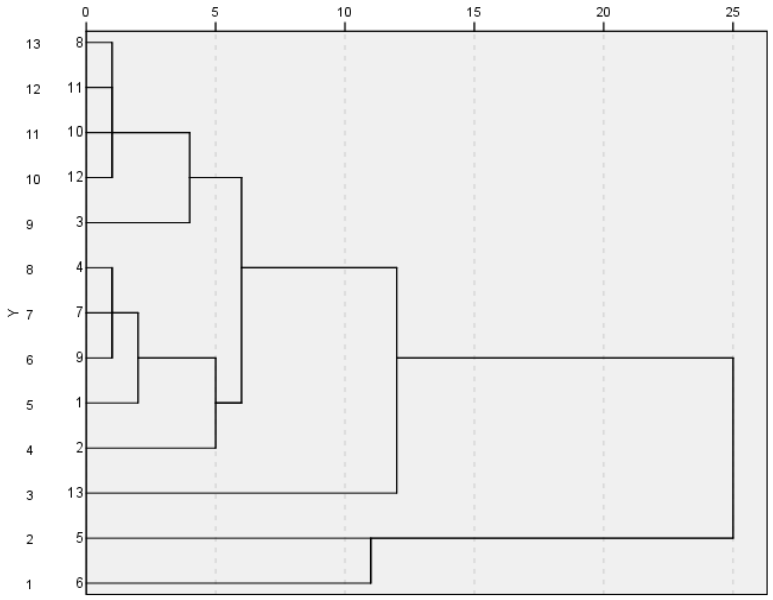

Fig.3 Cluster tree

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According to the clustering results shown above, the 13 regions and counties of Hefei are divided into 5 categories, among which the first category is Chaohu Jingkai District, Feixi County, Feidong County, Lujiang County and Shushan District. The second category: Baohe District, Xinzhan District, Changfeng County, Yaohai District, Luyang District; Third category: Chaohu City; Fourth category: high-tech zone; The fifth class; By the open area.

Among them, the differences between the first and second categories are relatively small. Among them, chaohu City, high-tech zone and economic development zone differ greatly, and the clustering classification results are relatively intuitive. More reflects the different types of regional construction investment.

3.2 Factor analysis

Taking 11 evaluation levels as the original variables, SPSS software was used to analyze and evaluate the social security investment degree of 13 regions in Hefei, and factor analysis was conducted on the social security investment degree of each region according to the factor score and comprehensive score.

According to the table of contribution rate of characteristic root and variance, when the score reaches 3, the cumulative contribution rate has reached 86.5%, thus three principal components can be obtained

Table 3 Component matrix

	ingredient		
	1	2	3
X_1	.865	-.315	.150
X_2	-.075	.822	.403
X_3	.859	-.244	-.285
X_4	.862	-.239	-.342
X_5	.788	.038	-.387
X_6	.842	-.212	-.405
X_7	.761	-.513	.199
X_8	-.108	.942	.051
X_9	.803	.225	-.023
X_{10}	-.092	.217	.928
X_{11}	.954	-.062	.102
Extraction method: principal component			

After the component matrix is rotated, each principal component can be well explained by the corresponding evaluation level. As you can see from the composition matrix after rotation, the common factor F1 is

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X_1、X_2、X_3、X_4、X_5、X_6、X_7、X_8、X_9、X_{10}、X_{11}

Therefore, F1 can be regarded as a public factor reflecting the construction of public facilities, social security, education and culture. F2 has a large load on X2 and X8, so F2 can be regarded as a factor reflecting the future of a city. F3 has a large load on X10, which can be regarded as the input factor of service industry construction. In combination with the scores of three common factors and comprehensive factors in each region of Hefei city, the investment degree of social security construction in each region is then evaluated. According to the component score coefficient matrix, the expressions of the following common factors can be obtained:

$$F_1 = 0.164X_1 + 0.1X_2 + 0.133X_3 + 0.129X_4 + 0.137X_5 + 0.123X_6 + 0.127X_7 + 0.075X_8 + 0.19X_9 + 0.081X_{10} + 0.204X_{11}$$

$$F_2 = -0.116X_1 + 0.389X_2 - 0.005X_3 + 0.008X_4 + 0.164X_5 + 0.032X_6 - 0.247X_7 + 0.512X_8 + 0.211X_9 - 0.041X_{10} + 0.043X_{11}$$

$$F_3 = 0.236X_1 + 0.154X_2 - 0.097X_3 - 0.139X_4 - 0.225X_5 - 0.192X_6 + 0.296X_7 - 0.128X_8 + 0.013X_9 + 0.64X_{10} + 0.166X_{11}$$

Table 4 Score table of factors

Feidong County	1.75845	0.40355	-0.65278
Feixi County	1.57747	0.47304	-0.27215
Baohe District	0.66173	-0.77394	2.19366
Changfeng County	0.84553	-0.28024	-0.63661
Gaoxin District	-0.52274	2.77199	-0.15659
Jinkai District	-0.61333	0.92659	1.03557
Lujiang County	0.42106	-0.5647	-0.73955
Shushan District	-0.36608	-0.48554	1.26958
Chao City	0.07919	-0.95354	-0.91118
Xinzhan District	-0.73874	0.0399	0.51965
Luyang District	-0.58279	-0.47141	0.10727
Yaohai District	-0.9137	-0.784	-0.44739
Chao City Jinkai District	-1.60605	-0.3017	-1.30948

According to the value table of variance contribution rate obtained after rotation, the calculation formula of factor total score can be obtained:

Total score $=0.51981F_1+0.19904F_2+0.14661F_3$

According to the above calculation formula substitute F_1、F_2、F_3 the scores of each region in Hefei in each social security input are obtained. The comprehensive scores of each region are arranged in descending order to obtain the following ranking:

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Table 5. Ranking of factor scores

Feidong County	0.9	1
Feixi County	0.87	2
Baohe District	0.51	3
Changfeng County	0.29	4
Gaoxin District	0.26	5
Jinkai District	0.02	6
Lujiang County	0	7
Shushan District	-0.1	8
Chao City	-0.28	9
Xinzhan District	-0.3	10
Luyang District	-0.38	11
Yaohai District	-0.7	12
Chao City Jinkai District	-1.09	13
City or County	synthesis score	rank

4. The analysis of the causes of the differences in the scores of social security input among different regions in Hefei

Feidong County, Fexi County and Changfeng County ranked first in F1, the public facilities, social security, education and culture construction investment. Feidong County and Feixi County scored significantly higher than other regions and counties. By public infrastructure investment ways, Feidong, Feixi county, as an important economic area in Hefei, in formula one common factor score is very high, is ranked third Changfeng county scored twice, Feixi county, as the first big economic county, anhui nearly 10 years continuously on the national counties, Feixi county public facilities construction investment, the social security system construction achievements reached the best level; Feidong county, who won "the happiest city 18 ', 'strong county of Anhui province education' and so on the title, at the end of 2018, Feidong contributors in urban and rural residents basic health care for 918100 people, accounting for rate reached 100%, the resulting Feidong recently in terms of people's livelihood security construction, education investment has achieved good results. But Yaohai district, Chaohu economic development zone in F1 factor score in 13 area, while Yaohai district as the old industrial area, the original residents security does not reach the designated position, community planning, Hefei government regulation for the furnace area in recent years, a series of investment policy, such as community members station construction, community planning integration, etc., in the development of the future a long period of time Yaohai district will be better achievements in the city's security investment; Chaohu city in 2004, in Hefei economic development zone is the formal approval of success at the provincial level economic development zone, the region is the main purpose of the investment promotion and capital introduction, but according to above analysis and comprehensive evaluation of Chaohu city economic development zone obviously ignored the people's livelihood construction investment, as a new

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economic development zone, although does not require the construction of social security can reach the level matching with other residents more area, but too indifferent to, the backward social security investment will give the overall evaluation of the urban construction in Hefei have a negative impact.

In the Score of F2, evaluation of urban futuristic investment, the cities in the first three order are Gaoxin district, Jinkai district and Feixi County. By the open area is in Hefei in 2000 was approved by the State Council as a national economic and technological development zone of new economic and technological development zone, by the open area of the industrial economy largely promoted the economic development of Hefei, and comprehensive evaluation in the Midwest state-level economic development zone in the first place, by the open area in the urban and rural construction in Hefei, financial input in science and technology, etc. In the evaluating standard of F2 scoring the first area is the high-tech zone, Hefei hi-tech zone is the only state-level high-tech industrial development zone in Anhui province, also known as the most dynamic economic growth area in Anhui province and opening to the outside of the door, the achievements of science and technology is close to the government's financial support, and is also captures the high-tech zone in Hefei this distinctive prospects of the development of high and new technology development zone, showing "highland lake city, innovation" with hefei urban business card of development strategy, developing characteristic; Low scores on the evaluating standard of F2 Chaohu city have great similarities, and package riverfront Chaohu city and is within the scope of tourism in Hefei package riverfront relatively developed areas, Chaohu as a county-level city with the masses of the Chaohu city, natural resources and development of the good fishing, Chaohu city, the main source of income depending on tourism and fishing, dependent industry result in Chaohu city hard in the future the evaluation level to make good progress, hard to combined with high and new technology. F2 city future factor is highly correlated with regional characteristic development and industry dependence of each region.

In F3, Baohe District, Shushan District and Jingkai District ranked top three in terms of business services. The economic development of Baohe District is very special. The growth of the first, second and tertiary industries has declined in recent years, but the development of domestic and foreign trade has been steadily rising, which also reflects the impact of the industrial transformation of Baohe District from one side. As the center of various state-owned enterprises and government departments, Shushan district has played an exemplary role in the development of commercial service.

5. Conclusions and Suggestions

In this paper, the composite index method is used to measure the investment degree of social security construction in 13 regions of Hefei by descriptive statistical analysis, factor analysis and cluster analysis. The comprehensive evaluation results show that the investment intensity of social security construction in each region of Hefei differs greatly. The financial expenditure of the old city and the new city does not belong to the same magnitude in many aspects of evaluation. This is the result of

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the excessive pursuit of characteristic development, industrial dependence and obsolete and solid structure in some regions, and the neglect of some basic guarantee construction in the economic and technological development of the city. For areas with extremely low expenditure on public security, medical and health care and family planning, Hefei Municipal government and other regional governments should pay attention to them. For example, the public security input of Xinzhan District is only 1/6000 of that of Feidong County, which leads to the weak link effect of Hefei city's lack of solid foundation in urban development and construction. In the pursuit of regional characteristic and strong regional target, comprehensive consideration should be given to the benefits brought by the comprehensive construction of social security, so as to achieve a balance between characteristic development and stable development.

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