สถาบันวิทยาการจัดการแห่งแปซิฟิค
PACIFIC INSTITUTE OF MANAGEMENT SCIENCE

Efficiency evaluation of fiscal input in China's sports industry based on the DEA model

Haotian Han* Anong Rungsuk*Pimsupak Sedtheesakolwatchara*
Phd Candidate, Faculty of Management, Shinawatra University
Email: 1135734624@qq.com

Received August 26, 2023 Revise September 24, 2023 Accepted December 31, 2024

Abstract

The data of Chinese mainland 31 provinces from 2013 to 2022 were selected as samples, and the DEA model and one-way variance analysis were used. The results show that: First of all, the technical efficiency and scale efficiency of the fiscal input in China's leading industry show an upward trend. Secondly, the pure technical efficiency is high in the east and low in the west, lower than the east and higher than the west. The scale efficiency is high in the west and low in the east, lower than the west, higher than the east, and the middle is higher than the east. Third, at present, the technical efficiency of China's fiscal input is relatively low, and it has failed to achieve comprehensive effectiveness. Based on this view:should expand the scale of fiscal investment in the sports industry ,optimize the fiscal input structure of the sports industry and strengthen the supervision and evaluation of the fiscal expenditure of the sports industry. As can be seen from the DEA analysis result, we should further increase the scale of fiscal investment in the sports industry in the western and central regions. Expand the scale of fiscal transfer payments in the western and central sports industry, increase the western and central region of the national fitness, public sports venues, sports parks and community stadium fiscal investment, improve the sports industry guide funds, meet the demand of the masses of the Midwest of sports fitness, strengthen the market main body to participate in the Midwest sports products and services supply enthusiasm. In the central and western regions, the fiscal revenue, the government available fiscal resources and the problem of insufficient investment in the sports industry.

Keywords: Sports Industry, Fiscal Input, DEA

Introductions

Although China's sports industry started relatively late, the Chinese government attaches great importance to the development of China's sports industry. After 2014, it continued to issue relevant government documents to promote the development of China's sports industry. Among various policies, fiscal policy is one of the important measures to promote the development of sports industry. The implementation of these fiscal policies, especially the effect of fiscal input, has become a common concern for the government and all sectors of society. fiscal input is the basic guarantee for the development of sports, and the efficiency of fiscal input is the key factor restricting the sustainable development of sports in China. In recent years, China's financial investment in the sports industry has been increasing, but the structural allocation of financial funds is not reasonable, resulting in low financial

efficiency and blocking the healthy development of the sports industry. Charnes A., et al. (1978).

In recent years, Chinese scholars have conducted various studies on the fiscal input efficiency of China's sports industry. For example, Weiyu. S.(2014) used data envelope analysis to evaluate the performance of local mass sports financial investment in 30 provinces outside Xizang in 2011. Li L., et al. (2015). studied the issue of public financial investment in mass sports in China. MAO Jun (2019) used the three-stage DEA efficiency model to calculate the fiscal efficiency of local governments. Junyin, Z(2021) used DEA-Tobit model to analyze the input and output benefits of sports industry and its influencing factors in 31 provinces in China from 2011 to 2019. But the difference of China's sports industry fiscal input efficiency evaluation and optimize the efficiency of optimization and output, to better power regional sports industry health sustainable development path selection of research is less, based on this, the DEA data envelope analysis, one-way variance analysis and difference evaluation method, the efficiency of China's sports industry fiscal input and output evaluation, in order to better help regional sports industry healthy sustainable development.

Objective of Research

1. To study one-way variance analysis and difference evaluation method, the efficiency of China's sports industry fiscal input and output evaluation, in order to better help regional sports industry healthy sustainable development.

Methodology

Data Envelopment Analysis (DEA)

Charnes created in 1978, is a non-parametric statistical method that uses the mathematical planning model to evaluate whether the same type of multi-input and multi-output decision unit (DMU) is the technology and scale effective.

BCC model

BCC model divides the comprehensive efficiency into pure technical efficiency and scale efficiency. Low comprehensive efficiency means that it may be the improper allocation of pure technical resources or the problems in scale arrangement. In addition, through the BCC model, it can be judged that the decision unit is increasing or decreasing in scale. The corresponding BCC model can be represented as formula：（1）

$$\min \theta - \varepsilon(eTS^- + eTS^+)$$

$$\text{s.t.} \quad \begin{cases} \sum_{j=1}^{n} X_j \lambda_j + S^- = \theta X_0 \\ \sum_{j=1}^{n} Y_j \lambda_j - S^+ = Y_0 \\ \lambda_j \geq 0, \quad S^-, S^+ \geq 0 \end{cases} \qquad \text{Formula (1)}$$

Among them, j represents the decision unit, X and Y represent the input and output vectors, and the DEA model aims to solve the problem of linear planning.If $\theta=1$, $S^+=S^-=0$, the DEA is valid; if $\theta=1$, $S^+\neq 0$, $S^-\neq 0$, the weak DEA is valid; if $\theta<1$, the non-DEA is valid. The comprehensive efficiency can be calculated through the DEA model, and further decomposed into scale efficiency and pure technical efficiency, and the Comprehensive Efficiency = Scale Efficiency × Pure Technical Efficiency.

Output-oriented DEA model

The relative efficiency evaluation of DEA is divided into two models, one is the input orientation, that is, the minimum input at the given output level; the other is the output orientation, which is the maximum input at the established input level for each output. Due to the arrangement of China's government agencies and financial budget system, it is difficult for regions to control the fiscal input of mass sports in various regions, and the public need for public sports services, especially mass sports, is increasing. Therefore, to choose to increase output to meet the needs of mass sports, this paper also adopts the output-oriented DEA model.

Factor analysis of variance

One-way variance analysis was used on the data of fiscal input efficiency of sports industry in Chinese mainland 31 provinces in 2013-2022. The specific application is to test the comprehensive efficiency, pure technical efficiency and scale efficiency values of the eastern, central and western regions to test whether the efficiency values have significant differences between different regions.

Research index system and original data selection

Selection of indicators

According to the Opinions on Promoting National Fitness and Sports Consumption and Promoting the High-quality Development of the Sports Industry issued by the Chinese Government in 2019, the input index selected 31 provinces (autonomous regions, municipalities directly under the Central Government) fiscal input of sports industry in 2013-2022. The output index is selected from 31 provinces (autonomous regions and municipalities directly under the Central Government) 2013-2022 . There are 12 indicators in five dimensions, such as sports industry scale and structure, venue and facilities construction, employees, market subjects, and sports consumption. The selection of indicators is shown as follows.

Tabel 1 Type of Variable

Type of Variable	Dimension	Variable
Input	fiscal input in the sports industry	fiscal input in the sports industry
Output	Scale and structure of the sports industry	Sports industry output value
		Value-added value of sports service industry
		The added value of sports service industry accounts for the added value of sports industry
	Construction of venues and facilities	The number of sports venues per 10,000 people
		Stadium area
		Sports field area per capita
	Employee	Number of employees working in the sports service industry
		Average salary of employees in the sports industry
	Main market players	Sports service industry legal entity

Sport consumption	The proportion of legal entity of sports service industry in legal entities of sports industry Per capita sports consumption of the whole society Regular participate in physical exercise

Data sources

In the research, the data of the input indicators and output indicators of Chinese mainland 31 provinces during the 10 years from 2013 to 2022 are selected, and the input data and output data are derived from the Statistical Yearbook of Sports undertakings.

Study results and analysis

Using DEAP software, input relevant data. In the Config EG 1-INS file select the INPUT option (calculated from an input perspective), select VRS (Variable Scale Reward), and calculate the data by DEA (MULTI-STAGE) analysis, and obtain the comprehensive efficiency, pure technical efficiency, scale efficiency and relaxation variables of input and output variables.

Pure technical efficiency analysis

Table 2 fiscal input efficiency of China's sports industry

Region		Province	Comprehensive Technical Efficiency	Pure Technical Efficiency	Scale Efficiency
The Region	Eastern	Beijing	0.395	0.945	0.418
		Tianjin	0.614	0.866	0.709
		Shanghai	0.443	0.843	0.545
		Hebei	0.381	0.763	0.509
		Zhejiang	0.319	0.797	0.415
		Fujian	0.729	0.804	0.906
		Hainan	0.472	0.611	0.772
		Liaoning	0.390	0.562	0.702
		Shandong	0.383	0.881	0.435
		Guangdong	0.375	0.936	0.427
		Jiangsu	0.312	0.738	0.427
The Region	Central	Anhui	0.306	0.385	0.774
		Shanxi	0.761	0.894	0.859
		Jiangxi	0.316	0.381	0.836
		Henan	0.341	0.628	0.529
		Jilin	0.344	0.772	0.863
		Heilongjiang	0.666	0.385	0.879
		Hubei	0.510	0.756	0.661
		Hunan	0.425	0.561	0.741
		Chongqing	0.499	0.758	0.633
		Sichuan	0.625	0.756	0.804
		Nei Monggol	0.343	0.386	0.855
		Guizhou	0.232	0.293	0.790
		Yunnan	0.244	0.302	0.806
The Region	Western	Xizang	0.288	0.366	0.784
		Shaanxi	0.178	0.205	0.857
		Gansu	0.159	0.242	0.713
		Qinghai	0.451	0.563	0.801
		Xinjiang	0.181	0.231	0.765
		Guangxi	0.255	0.290	0.872
		Ningxia	0.361	0.422	0.842

Pure technical efficiency (VRSTE) is the technical efficiency when considering the benefits of scale, and the pure technical efficiency is the production efficiency affected by factors such as management and technology. In order to make a better comparison of the output data, according to the division of the provinces of the National Bureau of Statistics, the pure technical efficiency of the sports industry in the east, central and western regions of China is analyzed.

As can be seen from Table 2, in the eastern region Beijing has the highest pure technical efficiency of the sports industry in the eastern region, and Liaoning has the lowest in the eastern region. It is worth noting that the pure technical efficiency of Beijing, Guangdong, Tianjin and Shanghai is most close to 1, and the technical efficiency is effective, and they are at the forefront of pure technical efficiency.

In the central region Shanxi has the highest pure technical efficiency in the sports industry, and Jiangxi has the lowest in the sports industry. It is worth noting that in this region Shanxi was effective.

In the western region Chongqing is the province with the highest pure technical efficiency of the sports industry in western China, and Shaanxi has the lowest. The pure technical efficiency of Chongqing and Chengdu are 0.758 and 0.756,which is closely to 1, indicating that the pure technical efficiency of the sports industry is good, and the technical efficiency is effective.

In order to show the change of pure technical efficiency of fiscal input of sports industry in different regions, the change trend chart of pure technical efficiency of fiscal input of sports industry in eastern, central and western regions from 2013 to 2022 is drawn.

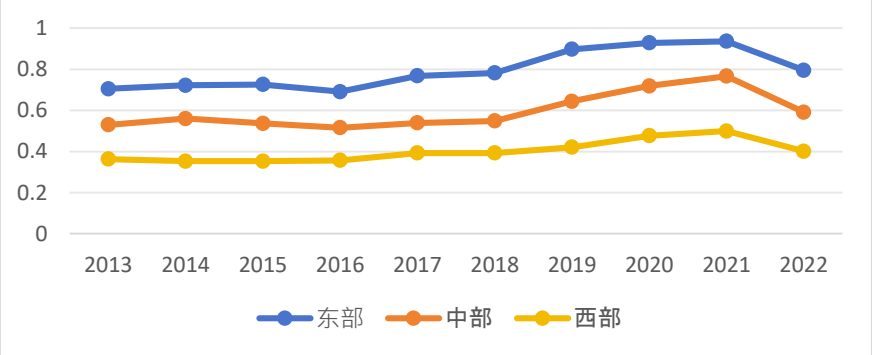

Figure 1 Change trend chart of the pure technical efficiency of the sports industry fiscal investment in the eastern, central and western regions from 2013 to 2022

In general, the change of pure technical efficiency of the sports industry in the eastern, central and western regions of China from 2013 to 2022 shows the following characteristics:

First of all, the pure technical efficiency of the fiscal input of the sports industry in the eastern, central and western regions of China shows an increasing trend. In 2013, the national average pure technical efficiency was 0.533, and reached 0.734 in 2021. In 2022, the overall impact of the epidemic showed a downward trend, and the average value from 2013 to 2022 was 0.597. In the eastern region, the pure technical efficiency of the fiscal input of the sports industry declined in 2016, and the pure technical efficiency of the fiscal input of the sports industry in the central region also decreased in 2016. The pure technical efficiency of

the fiscal input of the sports industry in the western region has been showing an upward trend except for 2022.

Secondly, the pure technical efficiency of the fiscal input of the sports industry in the eastern region is greater than that of the central region, and the pure technical efficiency of the sports industry in the central region is greater than that of the western region. Through comparison, it is found that the average pure technical efficiency of fiscal input of sports industry in eastern provinces is 0.795, that of sports industry in central provinces is 0.595, and the pure technical efficiency of sports industry in western provinces is 0.401. Mainly because the pure technical efficiency of the fiscal input in the sports industry is closely related to the overall level of economic and social development, Eastern region has more money going into the sports industry, And because the economy and society are generally relatively developed, In the sports industry output value, the added value of sports services, the added value of sports services accounted for the proportion of the added value of the sports industry, sports venues, per ten thousand people, sports area, sports area, sports service industry employment, sports industry average salary, sports services legal person unit of the sports industry, the whole society per capita sports consumption, often participate in the physical exercise indicators such as performance more prominent. But at the same time, and not completely with economic and social development to measure the sports industry finance pure technical efficiency, although the economy is relatively developed, investment in the development of sports industry fiscal capital is more, but the sports industry high quality related industry is less than the less developed areas, this kind of situation also exists. It shows that the structure of fiscal investment in sports industry in the eastern region is more reasonable than that in the central and western regions, and the central and western regions are connected. To optimize the investment structure and improve the efficiency of the use of funds, we should further strengthen the structural adjustment and optimization of the fiscal investment in the sports industry.

Scale and efficiency analysis

Scale efficiency (SCALE) is the efficiency of scale when considering the benefits of scale. Scale efficiency is the production efficiency affected by the scale factor. Scale efficiency is used to measure the distance between the production front edge and the scale return is unchanged when the scale return is variable. In order to make a better analysis and comparison of the output data, the east, central and west provinces of China are divided according to the National Bureau of Statistics. The scale and efficiency of fiscal investment in sports industry in the east, middle and west are analyzed.

As can be seen from Table 2, in the eastern region Fujian has the highest efficiency of the sports industry in the eastern provinces, and Guangdong is the lowest pure technical efficiency of the fiscal investment in the sports industry in the eastern provinces.

In the central region, Heilongjiang has the highest efficiency of the sports industry in the central region, and Henan has the lowest pure technical efficiency of the fiscal investment in the sports industry in the central region. In the western region, Guangxi has the highest fiscal input scale efficiency of sports industry in the western region, and Chongqing has the lowest pure technical fiscal input efficiency of sports industry in the provinces in the western region.

In order to show the changes of the scale and efficiency of fiscal input in sports industry in different regions, the change trend chart of the scale and efficiency of sports industry in eastern, central and western regions from 2013 to 2022 is drawn.

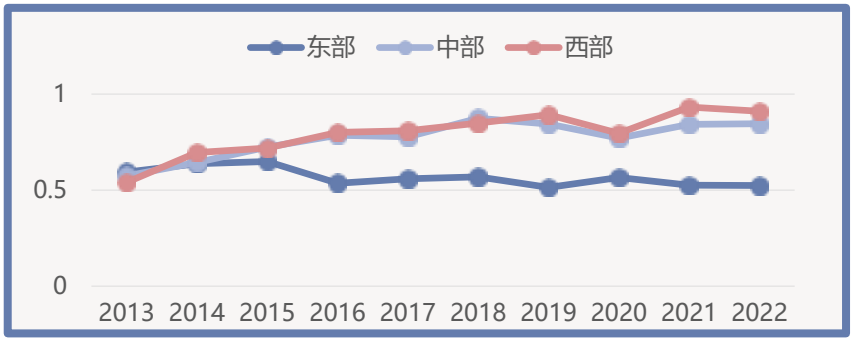

Figure 2 Scale and efficiency of fiscal investment in the sports industry in the eastern, central and western regions of the region from 2013 to 2022 trend chart

In general, the change of the fiscal investment scale and efficiency of the sports industry in the eastern, central and western regions of China from 2013 to 2022 shows the following characteristics:

First of all, the scale and efficiency of fiscal investment in China's sports industry show an increasing trend. In 2013, the national average scale efficiency was 0.569, and reached 0.766 in 2022, increasing by 0.197. And the national average from 2013-2022was 0.71, which is higher than the pure technical efficiency. The technical efficiency of the national fiscal input is lower than the scale efficiency of 0.113. It shows that the technical efficiency of the national fiscal input is relatively low, and the investment structure of fiscal funds should be further improved and optimized to improve the technical efficiency.

Secondly, the scale efficiency of the central and western regions increases, while the scale efficiency of the eastern regions decreases. It can be seen from the above trend changes that the scale and efficiency of fiscal investment in the sports industry in eastern China show a downward trend, and the scale and efficiency of fiscal investment in the sports industry in the central and western regions show an upward trend.

Thirdly, the scale and efficiency of sports industry in the western region are greater than that of the central region, and the central region is greater than that of the eastern region. The average efficiency of fiscal investment in sports industry in eastern provinces is 0.567, that of sports industry in central provinces is 0.768, and the efficiency of fiscal investment in western provinces is 0.794. Mainly due to the developed economy of the eastern region compared with the central and western regions, the public's sports demand can be met, which is easy to produce scale effect, while the investment and supply of the sports industry in the central and western regions are insufficient, and the investment scale of the sports industry is still a large gap. The supply pressure of the sports industry is less than that of the eastern region. For a long time, due to the large fiscal revenue in the eastern developed regions, the fiscal funds invested in the sports industry are also relatively abundant, and the scale and efficiency of their investment is lower than that in the central and western regions. However, the scale of fiscal investment in the sports industry in the central and western regions is insufficient, and there is still much room for the improvement of scale efficiency. Only when

the scale of public fiscal investment should be further increased to achieve the optimal efficiency.

Fourth, the technical efficiency of central and western regions is lower than the scale efficiency, and the technical efficiency of western regions is higher than the scale efficiency. The technical efficiency of fiscal input of sports industry in eastern region is higher than scale efficiency 0.228; the technical efficiency of sports industry in central region is 0.172, and the technical efficiency of sports industry in western region is lower than scale efficiency 0.393. The fiscal investment of sports industry in the central and western regions is in the trend of increasing scale efficiency, which shows that there is still room for improvement of scale efficiency. We should further strengthen the fiscal investment of funds, strengthen the management and use of public fiscal funds, and improve the scale efficiency.

Comprehensive technical efficiency analysis

Comprehensive technical efficiency (CRSTE) is equal to the product of pure technical efficiency and scale efficiency, and comprehensive technical efficiency is the technical efficiency when not considering the scale benefits. Comprehensive technical efficiency is a comprehensive measure and evaluation of the resource allocation ability and resource use efficiency of the decision-making unit. In order to make a better analysis and comparison of the output data, according to the comprehensive technical efficiency of the fiscal input of the National Bureau of Statistics, according to the division of the provinces of the provinces in China.

As can be seen from Table 2, in the eastern region Fujian has the highest comprehensive technical efficiency of fiscal input in the sports industry in the eastern region, while Jiangsu has the lowest pure technical efficiency of fiscal input in the sports industry in the eastern region.

In the central region the comprehensive technical efficiency of sports industry capital investment in central Shanxi Province is the highest, and the pure technical efficiency of sports industry capital investment in central Anhui Province is the lowest.

In the western region, Sichuan is the province with the highest comprehensive technical efficiency of fiscal input in sports industry in western region, and Gansu has the lowest pure technical efficiency of fiscal input in sports industry in western region.

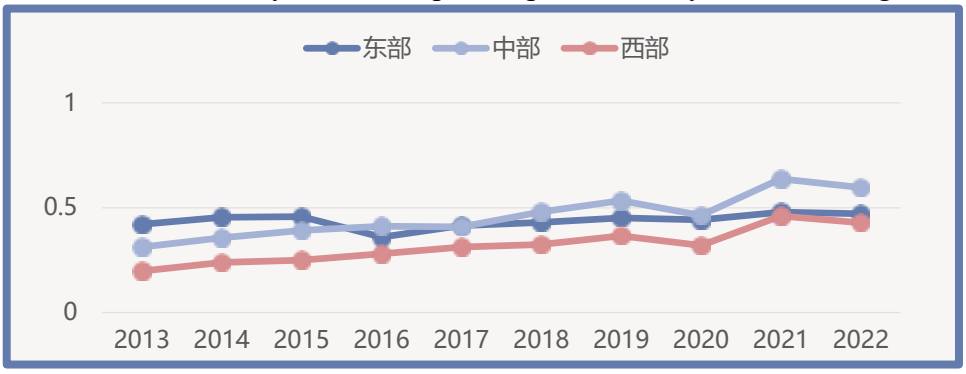

Figure 3 Comprehensive technical efficiency of fiscal investment in sports industry in eastern, central and western regions 2013-2022 change trend chart

On the whole, the comprehensive technical efficiency of the fiscal investment in the sports industry in the eastern, central and western regions of China from 2013 to 2022presents the following characteristics:

First of all, the comprehensive technical efficiency of fiscal investment in China's sports industry shows an upward trend. It can be seen from the above trend changes that the comprehensive technical efficiency of the fiscal input of the sports industry in the eastern, central and western regions of China shows a trend of fluctuation and slow growth. The national average in 2013-2022 was 0.405, and the national average comprehensive technical efficiency in 2013 was 0.31, and it was 0.525 in 2022, an increase of 0.215. Due to the impact of COVID-19, it will decline in 2020.

Secondly, the comprehensive efficiency of fiscal input in sports industry in the central region is greater than that in the eastern region, and the eastern region is greater than that in the western region. Through comparison, it is found that the average comprehensive technical efficiency of fiscal input of sports industry in central provinces is 0.459, the average of fiscal industry in eastern provinces is 0.438, and the pure technical efficiency of sports industry in western provinces is 0.318.

Thirdly, the data of pure technical efficiency and scale efficiency in the central region is in the middle level, which determines its high comprehensive technical efficiency. According to the principle of DEA efficiency analysis, the comprehensive technical efficiency is composed of scale efficiency and pure technical efficiency. The comprehensive technical efficiency = scale efficiency and pure technical efficiency, and the comprehensive technical efficiency is affected by the dual effects of pure technical efficiency and scale efficiency. The pure technical efficiency in the central region is lower than the eastern region and higher than the western region; the scale efficiency in the central region is lower than the western region; the data performance is relatively stable, the comprehensive efficiency of sports fiscal investment in the central region is greater than that in the eastern region, and the eastern region is greater than the western region.

Analysis of the relaxation variables

Relaxant variables are usually introduced to facilitate solving within larger reliable domains. The variables introduced in the linear programming problem refer to the new non-negative variables introduced in the original inequality constraint condition when the linear programming problem is turned into a standard type. When the i th constraint is:

$$\mathbf{a_{i1} + a_{i2}x_2 + \cdots + a_{in}x_n \leq b_i} \qquad \text{(Equation 2)}$$

At the left end of the inequality of linear programming is the variable $\mathbf{x_{n+1}}$, so that the inequality becomes the equality, and$\mathbf{x_{n+1}}$ is the relaxation variable.

$$\mathbf{a_{i1}x_1 + a_{i2}x_2 + \cdots + a_{in}x_n + x_{n+1} = b_i} \qquad \text{(Equation 3)}$$

The investment index of this study selected 31 provinces (autonomous regions and municipalities directly under the Central Government) from 2013 to 2022 policy input. The output index selects the output value of sports industry from 2013 to 2022 from 31 provinces (autonomous regions and municipalities directly under the Central Government).

The added value of sports service industry, the added value of sports service proportion of the added value of sports industry, per ten thousand people have sports venues, sports area, sports area, sports service workers, sports industry employment average salary, sports services, sports services legal person unit of the sports industry, the whole society per capita sports consumption, often participate in physical exercise number, etc.The index of output is

expected output, so if the relaxation variable is greater than 0, the input and output are insufficient; to achieve the DEA effective, the input should be increased; if the relaxation variable is negative, the input or output is redundant; to achieve the DEA effective, the input or output should be reduced; if the relaxation variable is equal to 0, the output is completely compatible with the input, with no insufficient input or output.

Table 3 Average fiscal input relaxation in the sports industry from 2013 to 2022

Province	The mean of the relaxation variable	Province	The mean of the relaxation variable	Province	The mean of the relaxation variable
Gansu	4.8638	Tibet	3.3497	Zhejiang	1.2649
xinjiang	4.6792	Ningxia	2.8950	Hebei	1.2538
Guizhou	4.3339	Jilin	2.7887	Jiangsu	1.2244
Qinghai	4,3128	Sichuan	2.7189	Shandong	1.1734
Anhui	4.0987	Hunan	2.6811	Tianjin	1.1186
Liaoning	4.084	Hainan	2.6652	Chongqing	1.0041
Shaanxi	4.0694	Fujian	2.4926	Guangdong	0.9470
Nei Monggol	4.0408	Jiangxi	2.3842	Shanghai	0.8992
Guangxi	3.9847	Henan	2.3410	Beijing	0.4204
Yunnan	3.8817	Hubei	1.9962		
Heilongjiang	3.5431	Shanxi	1.4572		

According to the analysis of relaxation variables, from 2013 to 2022, the average value of the fiscal input of the sports industry in each province was ranked from small to large. The gap of sports industry fiscal input relaxation can be divided into three standards: high, medium and low. 12 provinces with more than 3 slack can be named as the areas with high fiscal input in the sports industry, including Gansu, Xinjiang, Guizhou, Qinghai, Anhui, Liaoning, Shaanxi, Shaanxi, Inner Mongolia, Guangxi, Yunnan, Heilongjiang and Tibet. Eight provinces with relaxation of more than 2 and less than 3 can be named as the gap area in the fiscal input of the sports industry, from Ningxia, Jilin, Sichuan, Hunan, Hainan, Fujian, Jiangxi and Henan. Ten provinces with less than 2 slack can be named as the areas with low gap of fiscal input in the sports industry, from large to small: Hubei, Shanxi, Zhejiang, Hebei, Jiangsu, Shandong, Tianjin, Chongqing, Guangdong, Shanghai and Beijing.

China's sports industry fiscal input optimization measure

Expand the scale of fiscal investment in the sports industry

As can be seen from the DEA analysis result, we should further increase the scale of fiscal investment in the sports industry in the western and central regions. Expand the scale of fiscal transfer payments in the western and central sports industry, increase the western and central region of the national fitness, public sports venues, sports parks and community stadium fiscal investment, improve the sports industry guide funds, meet the demand of the masses of the Midwest of sports fitness, strengthen the market main body to participate in the Midwest sports products and services supply enthusiasm. In the central and western regions, the fiscal revenue, the government available fiscal resources and the problem of insufficient investment in the sports industry.

Optimize the fiscal input structure of the sports industry

As can be seen from the results of DEA's analysis of pure technical efficiency, the average pure technical effect of China's sports industry in 2013-2022 is 0.597, which has not yet reached the "technical optimal", and there is still much room for efficiency improvement. Chinese government should reduce the cost of sports administration and organization operation and increase fiscal input in mass sports fields.

Strengthen the supervision and evaluation of the fiscal expenditure of the sports industry. To improve the comprehensive efficiency of the fiscal input in the sports industry, the corresponding supervision mechanism and evaluation mechanism are needed. The Chinese government to strict budget management, constantly refine the budget, strict budget implementation, strengthen the sports industry financial capital scheduling, give full play to the legislature, audit, the public, the social third party intermediary organizations, to participate in the supervision of sports public finance spending, actively carry out the sports industry financial funds in advance, after the performance evaluation.

Reference

Weiyu. S. (2014) Performance analysis of fiscal input of mass sports based on DEA model Journal sports science,34(9):11

Li L., et al. (2015) Research on the public fiscal input of mass sports in China, Journal of the Capital Physical Education College,2015,27(3):196.

Jun. M. (2019) Empirical study on the financial efficiency of local government to promote economic growth: based on the perspective of supervision intensity Journal the Chinese Soft Science,2019(6):99.

Charnes A., et al. (1978). Measuring the efficiency of decision marking units Journal European journal of operational research,1978,2(6):429.

Junyin. Z.(2021) Research on the fiscal policy to promote the high-quality development of the sports industry. 2021