Study on the Optimization and Adjustment Scheme of the Consumption Structure of Sports Goods in China Driven by Fitness

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Abstract: In the study of the optimization and adjustment scheme of the consumption structure of physical products under the driving of physical fitness, there are some shortcomings such as low accuracy of data analysis and high roughness of the optimization and adjustment. Therefore, the optimization and adjustment scheme of the consumption structure of physical products under the driving of physical fitness is proposed. The group intelligent algorithm is introduced to establish the hierarchical structure of sports goods consumption driven by fitness, and the parameters of the research model are determined to realize the construction of the research model of the optimization of sports goods consumption structure driven by fitness. Depends on the building model, and realize the rationalization of sports consumption to promote product structure research, sports consumption stimulate industrial optimization of ontology sports industry system research, consumption highlights leading industry upgrading comprehensive sports industry structure study, sports consumption to promote the sports industry structure equilibrium, driven by complete fitness sports goods consumption structure adjustment scheme optimization research in China. The experimental data show that the proposed optimization and adjustment research scheme is more accurate in data analysis than the conventional optimization and adjustment research scheme, and the roughness of the optimization and adjustment scheme is reduced by 36.9%, which is suitable for the study of the optimization and adjustment scheme of the consumption structure of physical supplies in China driven by fitness.

Keywords: Fitness driven; Sporting goods; Consumption structure; Optimize and adjust; Programme studies; Intelligent algorithms; Sports consumption

1. Introduction

The study on the optimization and adjustment scheme of the consumption structure of sports goods by means of market survey data analysis. But due to the limitations of data survey and investigation of constraints, when applied to fitness driven by China's products in the consumption structure adjustment scheme optimization research, data analysis accuracy is lower and higher roughness scheme optimization and adjustment of[1], is not suitable for fitness driven by China's products in the consumption structure adjustment scheme optimization research. Therefore, this paper proposes the optimization and adjustment scheme of the consumption structure of sports goods in China driven by fitness. The group intelligent algorithm is introduced to establish the hierarchical structure of sports goods consumption driven by fitness, and the research model is established to realize the optimization of sports goods consumption structure driven by fitness. Based on the construction of the model, the study

on the optimization and adjustment scheme of the consumption structure of sports goods in China driven by fitness was completed. In order to ensure the effectiveness of the study, the paper simulates the environment of body-building driven consumption of sporting goods. Two different optimization and adjustment research schemes are used to conduct the data analysis accuracy and the roughness simulation test of the optimization and adjustment of the research scheme. The experimental results show that the proposed optimization and adjustment scheme is highly effective.

2. Construct the Research Model of the Optimal Consumption Structure of Sporting Goods Driven by Fitness

2.1. Introduce swarm intelligence algorithms

Intelligent optimization algorithm to solve the general optimization problem. Optimization problems can be divided into function optimization problems to solve the

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value of independent variables in a function with the minimum function value and combinatorial optimization problems to find the optimal solution within a solution space to minimize the value of objective function[2]. Therefore, particle swarm intelligence algorithm, hereinafter referred to as particle swarm algorithm, is introduced. In this paper, particle swarm optimization is used to analyze the fitness driven consumption structure.

Given that the number of particles in the fitness driven consumption structure analysis group is M, the best position experienced by all particles in the group is Pg(t), which is called the global best position. There are[3]:

$$P_g(t) \in \{P_0(t), P_1(t), ..., P_M(t)\} \quad (1)$$

Then the evolution equation of particle swarm algorithm for fitness driven consumption structure analysis can be described as[4] :

$$v_{ij}(t+1) = v_{ij}(t) + c_1 r_{1j}(t)(p_{ij}(t) - v_{ij}(t)) \quad (2)$$

If the speed equation of the basic particle swarm algorithm only contains the cognitive part[5], that is:

$$v_{ij}(t+1) = v_{ij}(t) + c_1 r_{1j}(t)(p_{ij}(t) + v_{ij}(t)) \quad (3)$$

The construction diagram of particle swarm algorithm for fitness driving consumption structure analysis algorithm is shown in figure 1[6].
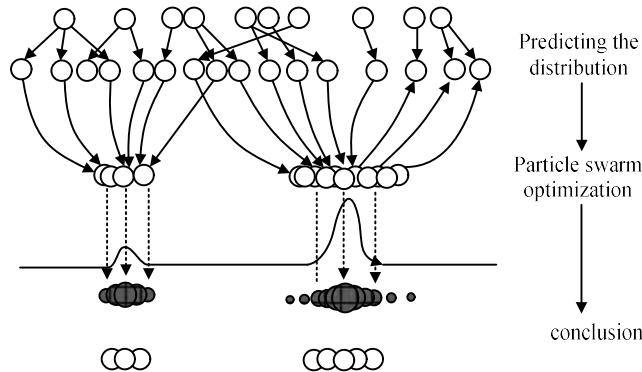

Figure 1. Particle swarm algorithm for fitness - driven consumption structure analysis algorithm construction schematic
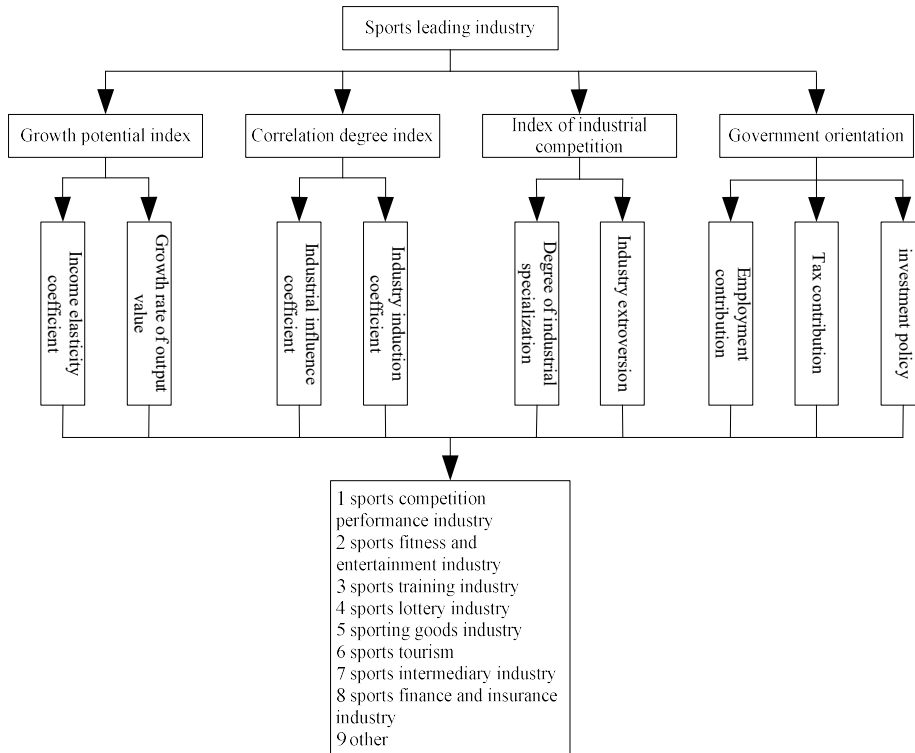

Figure 2. The framework of hierarchical target selection of sports leading industry

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2.2. Establish the hierarchical structure of sporting goods consumption

The hierarchical structure of sporting goods consumption can be divided into four layers, namely, target layer, criterion layer, indicator layer and scheme layer[7].

First of all, the target layer is the predetermined goal or ideal result of the problem, which is determined to build a research model of the optimization scheme of the consumption structure of sporting goods driven by fitness.

Second, the criterion layer is to achieve target need to consider the criterion, based on the theory of comparative advantage theory, industry associations and shinohara benchmark, considering our country's industry present situation and the policy guidance, to determine the consumption structure optimization choose four benchmark, respectively is: growth potential benchmark, correlation degree datum, the industrial competitive benchmarking and government guidance.

Thirdly, the index layer establishes the index system according to the factors of the influencing and measuring criteria layer. The index system established in this paper is as follows based on the establishment of the research model benchmark of the optimization program of the consumption structure of sporting goods driven by fitness[8] : Growth potential benchmark, Correlation index, Industrial competition index, The government guidance[9].

Finally, the scheme layer is composed of the internal structure of the sports industry. In order to ensure the accuracy of the scheme layer, 8 aspects were determined by searching references and integrating expert opinions.

2.3. Research model parameter determination

The bigger ω have better global search ability while the smaller ω have stronger local search ability. Therefore, as the number of iterations increases, the inertia weighting algorithm ω should be constantly reduced, so that particle swarm algorithm has strong global search ability in the early stage, and strong local search ability in the late stage[10].

Eberhart and Shi compared the performance of two algorithms that use vmax and shrinkage factor to control the fitness driving consumption structure to analyze particle velocity, and the results showed that the latter usually has better search rate than the former. However, in the solving process of some test functions, the contraction factor cannot reach the global extreme point within a given number of iterations. According to Eberhart and Shi, this is because the health-driven consumer structure analysis particles deviate too far from the desired search space. To reduce this effect, they recommend limiting the algorithm first when using the shrinkage factor, or presetting the size of the search space. The construction of a research model for the optimization of the consumption structure of sporting goods driven by fitness is realized.

3. Research on the Optimization Scheme of the Consumption Structure of Sports Goods Driven by Fitness

The optimization of sports industrial structure refers to the process of gradually improving the efficiency and level of sports industrial structure and promoting the rationalization and elevation of sports industrial structure through industrial adjustment. Optimization and upgrading of industrial structure on the one hand, sports is a relative concept, it is not the absolute discretion of level of industrial structure, but in the national economic benefit under the optimal target, according to the national or regional geographical environment, resources conditions, economic development stage and level of productivity, through to the sports industry structure adjustment, to keep up with the development of region or country state of the coordinated development of sports industry. On the other hand, the optimization and upgrading of sports industrial structure is a dynamic process, that is, the direction and objectives of the optimization and upgrading of sports industrial structure are different in different development stages and time points. The rationalization and elevation of product structure are two important indicators to measure the optimization of sports industrial structure.

3.1. The rationalization research of product structure caused by sports consumption

The rationalization of product structure caused by sports consumption is the process of the development of sports industry structure from unreasonable state to reasonable direction. The sports consumption urges the rationalization of the product structure to strengthen the weak links in the development of the construction industry, so as to adjust the proportion of each industry within the industry to achieve the coordinated development. This is the foundation and premise of sports industry development. Judging from the rationalization of the three standards, namely whether the output from the sports meet the effective demand of the market, the ratio between the development of sports industry in the industry are coordinated and sports resources are fully rational use of three ways, the development of sports industry in China have already can't satisfy the increasing sports consumption demand, especially sports service products themselves. The development of sports industry depends more on the development of sports goods industry formed by industrial transfer. However, the advantages of this industry have been gradually reduced, which ultimately needs to be driven by the development of sports service industry, especially the development of sports leading industry, and gradually drives China to become a sports power. Its sports consumption structure diagram is shown in figure 3.
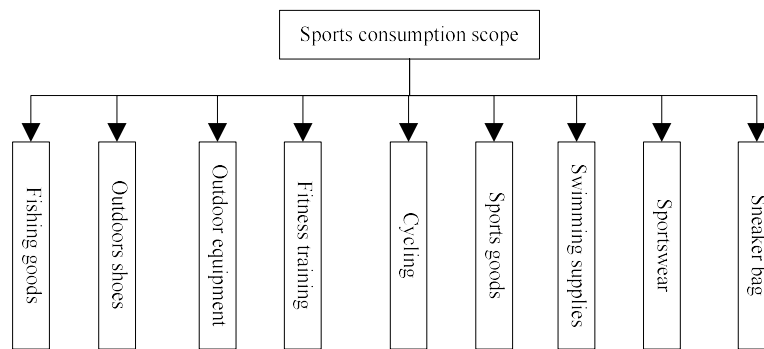
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Figure 3. Sports consumption structure chart

At the same time, sports consumption promotes the elevation of product structure, and sports consumption promotes the elevation of product structure, which refers to the process of constant evolution of sports industrial structure from low level to high level along with the change of demand, the use of innovative technologies and the improvement of capital intensity. In this dynamic process, the proportion of industries with high added value and high growth potential is gradually increased, while the proportion of industries with traditional technology backward is gradually reduced and eliminated, thus making the industrial structure of sports tends to be optimized. In the process of promotion, the sports industry structure, supported by certain resources and technological conditions, makes the most efficient use of sports resources and reaches the highest potential to meet the demand through constant promotion of sports industry structure as a resource converter.

The vicissitude of sports leading industry is the main content and key to the optimization of sports industrial structure. Reasonable leading industry is the core drive of the development of sports industry and the opportunity to form a reasonable and efficient industrial structure.

3.2. Research on the optimization of sports industry system in sports industry stimulated by sports consumption

Establish a complete, fully functional system of sports industry, sports industry is to optimize the structure of the prerequisite for plant according to the present situation of sports industry in China, first of all should speed up the expansion of sports competition performance industry, performance in sports competitions and sports fitness entertainment industry as the leading, in the masses, advocate science, health, fitness entertainment concept, guide the residents' sports consumption structure adjustment. And reasonable consumption demand will promote the rational flow of production factors, thus forming a reasonable sports industrial structure. Secondly, the development of sports fitness entertainment industry

and sports competition performance industry will form a strong forward correlation and backward correlation effect, which will significantly drive other sports related industries with backward development and improve the correlation quality of industrial questions.

3.3. Consumption highlights the comprehensive upgrading of sports industry structure driven by sports leading industry

According to the present situation of our country sports industry and sports industry "twelfth five-year" plan "targeted analysis of the current and future quite a long time, the development of the sports industry focus must be positioned on the sport leading industry, to dominate the industry sustained and efficient growth and significant effect on other industries growth promoting the sustained and rapid development of sports industry in our country. It can be seen from the above research results combined with the development status of China's sports industry that the current development of China's sports industry should focus on cultivating sports competition performance industry and fitness entertainment industry, accelerating the transformation and application of scientific and technological innovation in the above industries, and widening the market of participation and ornamental sports consumption. In addition, a number of sports industry groups can be set up with sports competition performance and fitness entertainment as the main content, with different emphases, focusing on the main industry and providing other sports services appropriately. The establishment of a sports industry investment holding company to exercise the investment function and control the controlling interest will be conducive to giving play to the scale economy effect of sports enterprises, to the comprehensive development of sports resources, and to expanding social and economic benefits.

3.4. Study on the balance of sports industry structure caused by sports consumption

As China's economic society has been in the mode of dual economic structure for a long time, as an integral part of economic development, the sports industry has also shown an obvious dual structure, and the development of the industry is in an obvious unbalanced situation. Due to the influence of society, policy, economy and resources, there is a big gap between different regions and between urban and rural areas in the development of sports industry. The path of combining moderate inclination and coordinated development mainly has two meanings. First, in terms of the allocation of sports resources and policy input among regions, the appropriate regional inclination is combined with the necessary regional compensation. Second, in the development of sports industry in various regions, moderate regional specialization and necessary diversification are combined. Therefore, the fundamental goal of narrowing regional gap and promoting common development is to promote the development of sports industry in underdeveloped areas, rather than to resist the development of developed areas.

4. Experimental Results and Analysis

In order to ensure the effectiveness of the study on the optimization and adjustment scheme of the consumption structure of sports goods in China driven by fitness, a simulation experiment was conducted. In the process of the experiment, the data analysis accuracy and the program optimization and adjustment roughness simulation experiment were carried out with the consumption situation of different fitness driven sports products as the experimental object. The status of fitness - driven sports goods consumption is simulated. In order to ensure the effectiveness of the experiment, the conventional optimization and adjustment research scheme is used as the object of comparison to compare the results of two simulation tests and present the test data in the same data chart.

4.1. Data analysis accuracy comparison

During the experiment, two different optimization and adjustment research schemes were used to carry out the work in the simulation environment, and the variation of data analysis accuracy of the optimization and adjustment research scheme was analyzed. The experimental comparison results are shown in table 1.

Table 1. Data Analysis Accuracy Comparison Table

Case type number	Routine analysis method /%	The analytical method presented in this paper/%
1#	45.65	86.54
2#	56.98	88.51
3#	52.47	89.54
4#	49.57	89.65
5#	58.68	90.25
6#	60.58	90.14
7#	55.47	91.05
8#	56.89	89.99
9#	51.58	92.45
10#	53.14	95.54

To study the optimization adjustment scheme, and general optimization adjustment research plan of data analysis arithmetic mean processing accuracy, it is concluded that an average figure for this type of general optimization adjustment research plan analysis accuracy was 54.10%, the proposed research plan of the optimization and adjustment accuracy is 90.36%, average data analysis concluded that the proposed optimization adjustment research scheme more routine optimization research plan data analysis accuracy by 36.26%.

4.2. Program optimization and adjustment of roughness contrast

During the experiment, two different optimization and adjustment research schemes were also used to carry out work in the simulated environment, and the variation of roughness in the optimization and adjustment of the study scheme was analyzed. The comparison curve of the test results is shown in FIG. 4.
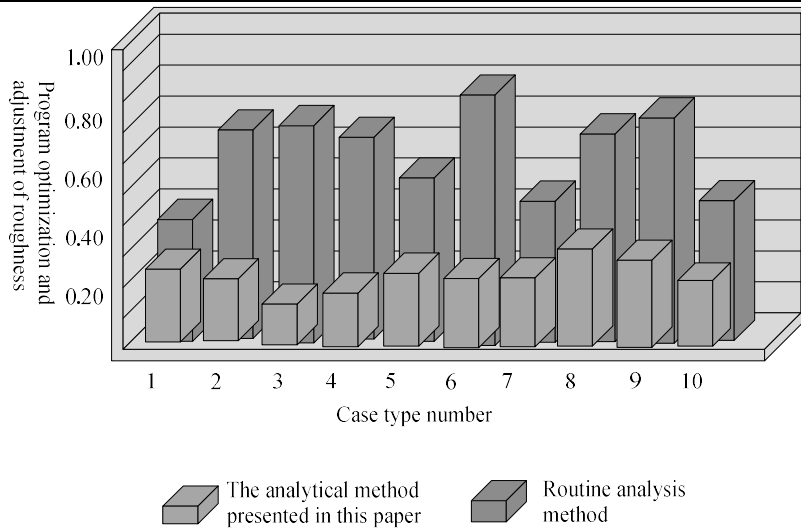
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Figure 4. Plan optimization and adjustment of roughness contrast diagram

To study the optimization adjustment scheme, and general optimization adjustment research plan scheme optimization arithmetic mean roughness, and draw a general optimization adjustment research scheme optimization of roughness is 63.14%, put forward the optimization of the adjustment research scheme optimization roughness was 26.24%, the study concluded that the proposed optimization and adjustment plan research more conventional optimization and adjustment of teaching overall quality to reduce 36.9%, suitable for fitness driven by China's products in the consumption structure adjustment scheme optimization research.

5. Conclusions

In this paper, an optimization and adjustment scheme for the consumption structure of sporting goods in China driven by fitness is proposed. Based on the construction and analysis of the research model, the research in this paper is completed. Experimental data show that the method designed in this paper is highly effective. It is hoped that the study in this paper can provide theoretical basis for the optimization and adjustment of body-building consumption structure in China.

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