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MANAGEMENT OF SPORTS INDUSTRY: MOVING TO ECONOMIC DEVELOPMENT

Abstract. *China's economy has achieved tremendous development in recent years. People's living standards have gradually improved. With economic development, people's pursuit of quality of life is increasing day by day, laying the foundation for developing China's sports industry. At the same time, the development of the sports industry to a certain stage would promote economic growth. For example, in some western developed countries, the contribution of the sports industry to the economy has far exceeded the traditional industry. It has become a new growth point for economic development. Although the China's sports industry has achieved certain development, it is still in its infancy. Compared with western developed countries, China's sports industry development is still relatively slow. There are still some problems in the development of the sports industry. This paper mainly discusses the relationship between China's sports industry and economic development. First of all, by understanding the development conditions, characteristics, and contribution to the economic growth of the foreign sports industry, the development process, development status, influencing factors, and existing problems were compared and analyzed. China's sports industry's economic and social effects on economic development were qualitatively described. Secondly, the gray correlation analysis method was used to empirically study the relationship between the added value of China's sports industry and the economic development index. The correlation degree was calculated. The results showed that the added value of the sports industry is highly related to the indicators of fixed asset investment, fiscal income, and added value of the tertiary industry. There is a moderate correlation with GDP and GDP per capita and a low correlation with the total import and export and employment personnel in the tertiary industry. At the present stage, the whole society fixed assets investment, fiscal revenue, total tourism, the added value, GDP, per capita GDP development of the sports industry added value have a significant role. In turn, total import and export as well as tertiary industry employment development on the increase of added value is not significant. Thus, they did not play a good driving role between each other. Finally, according to the qualitative and quantitative analysis results, there is a certain correlation between China's sports industry and economic development. The author put forward countermeasures and suggestions to drive the sound and rapid development of the sports industry.*

Keywords: sports industry, economic development, correlation analysis, quantitative analysis, Gray analysis method.

Introduction. The sports industry has been operating in the market economy system for more than one hundred years. Especially after the Second World War, the economy of the major western capitalist countries continued to grow. In turn, people's living standards have significantly improved competitive sports, especially professional sports, mass sports, especially fitness and leisure (Geta, 2001). The economic function of sports is becoming stronger and stronger. The status of the industry has been further established. At present, the sports industry has become one of the important industries in the national economy of developed countries. For example, the sports industry in the United States has become the first pillar industry. Italy takes the «football industry» as its main sports industry (Cun-sheng, 2005). At the end of the decade of the top ten pillar industries, the British sports industry surpassed the automobile manufacturing industry to become the pillar of national economic development (Hefner, 1990). The sports industry plays an indispensable role in the economic development and promotion of economic growth in developed countries (Jiang and Liang, 2014). China's sports industry started late, but it is very important to stimulate economic development and expand domestic demand (Julong,1978). Based on previous research theories, this paper used the grey correlation analysis method to analyze the China sports industry. It discussed the degree and dependence of China's sports industry and economic development

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and proposed corresponding policy recommendations (Estiri et al., 2010). The paper provided theoretical reference research for the further development of China's sports industry.

As an important field in the national economy, the sports industry has an increasingly obvious role in stimulating the economy (Hadian et al., 2020). The relationship between the sports industry and economic development is also getting closer (Xiandong, 2014). When the level of economic development reaches a certain stage, it will lay the foundation for developing the sports industry (Kearney, 2014). When the sports industry develops to a certain scale, it will have a multiplier effect on economic growth and promote economic development (Beibei, 2011). This article analyzed the correlation between the sports industry and economic development to find the exact relationship between the sports industry and economic development, study the problems existing in the development of sports industrialization at this stage in my country, and seek to develop sports industrial approach better (Chu et al., 2019). Therefore, the correlation between the sports industry and economic development has important theoretical and practical value.

Literature Review. Professor Deng Julong proposed Grey Theory in 1978. The system extracts valuable information through the generation and development of known information, accurately describes and effectively monitors the operation behavior and evolution of the system. It is a kind of theory and method used to study the problems of small amounts of data and information and uncertainty. The system often contains multiple influencing factors, and each influencing factor influences the other and contributes to the development of the system together (Shan-dong, 2014). Different influencing factors have different degrees of contribution to the development of the system. There are decisive and negligible factors. Grey relational analysis in grey system theory could calculate the degree of influence of different influencing factors on the development of the system, that is, the degree of correlation between each influencing factor and the development of the system. Based on the analysis of the history and characteristics of the industry, Chunfeng et al. (2010) defined the industry as the collection of enterprise economic activities with certain similar attributes. From the perspective of industrial economics, Gongpu (2005) described the industry as a collection of enterprises producing similar or some alternative related products and services. Weigen (2001) pointed out that the industry is a collection of enterprises with the same attributes and a part of the national economy divided by a certain standard.

Chinese scholars have conducted an extensive and warm discussion on the specific connotation of the sports industry, which could be roughly divided into the following four categorie (Wu, 2015).The first view is that the sports industry is part of the tertiary industry because the sports industry is an industry that provides services in the form of live labor. The second view holds that all the production and business activities related to sports are the sports industry. Thus, the sports industry includes the production departments of sports services and tangible sports products. This view is widely used in China. The 2015 and 2019 editions of the National Sports Industry Statistical Classification were classified according to this definition. The third and fourth types of views put the sports industry under the sports category. The former believed that the sports industry is the title of the period of sports during the transformation of China's economic system. In contrast, the latter believed that the profitable part of sports is the sports industry. The fourth kind of view is to take economic theory as the starting point, believing the sports industry is the sphere of sports that could enter the market and make a profit, while the sphere that must rely on government support is the sports cause.

Analysis of the contribution of the foreign sports industry to the economy:

– Analysis of the contribution and importance of the United States sports industry to the economy (Sagas, 2004). The United States is a strong country in developing the sports industry in the world. Its sports industry is extremely developed. According to the country's regulations, the three industries in the United States are divided into industries, accounting for more than the total value, and the sports industry creates. The output value has ranked third in the national economy. Slightly second only to commercial banks and the securities market, the average capital interest rate of the sports industry has reached over 80% (Taatila, 2010). The highly developed American sports industry has had an important impact on the

American economy. In the 1990s, the sports market continued to expand and reached an unprecedented scale. The total output value of the sports industry reached US$1.523 billion, making it the eleventh largest industry in the United States, accounting for a large proportion of GDP. The sporting goods industry is an important part of the American sports industry. In the 1970s, the sporting goods industry showed rapid growth momentum globally. Nike and Reebok are the two giants in the sporting goods industry that have made great contributions to the American sporting goods industry. They have played an important role in promoting the development and growth of the entire sports industry.

– Analysis of the contribution and importance of the British sports industry to the economy (Porter and Chin, 2012). After the Industrial Revolution, Britain became the center of the world economy. The British sports industry system and the sports market development are quite complete. Still, the sports industry has developed slowly in the UK, and it did not begin to develop rapidly until the 1960s (Preuss, 2005). According to relevant statistics, the output value of the sports industry has exceeded that of the automobile and tobacco industries. At the same time, the sports industry has played an important role in reducing the unemployment rate and achieving full employment.

– Analysis of the contribution and importance of the French sports industry to the economy (Jeong et al., 2015). According to relevant statistics, there are 200,000 sports clubs in France, with 15.5 million officially registered members, a sports population accounting for 83% of the total population, and about 6,000 professional athletes. The fitness and entertainment industry is the mainstay of the French sports industry. As the French sports population accounts for more than two-thirds of the total population, the country's mass sports consumption level is relatively high compared to other countries.

– Analysis of the contribution and importance of the Japanese sports industry to the economy (Probert et al., 2013). The sports industry in Japan can be roughly divided into sports products, sports services, sports information, and sports activity space industries. To develop the sports industry and adapt to social needs, Japan focuses on researching and developing new sports products and activities, tapping consumer needs, maintaining and expanding customers, making a reasonable budget, and determining reproduction speed (Oga and Kimura, 1993). The Japanese government has adopted and promoted work flexibility to achieve long-term decentralization, ensure the time for sports activities, and deal with issues such as competition with public sports facilities. After some incentives by the Japanese government, the sports industry has formed a sports industry dominated by the leisure sports industry. The sports industry accounts for 8.3% of the leisure market.

Analysis of the contribution of China's sports industry to the economy:

– The sports industry has effectively promoted the development of related industries (Huang, 2011). The sports industry is closely related to other industries in the national economy. First of all, the sports industry could trigger good investment in consumer propensity. Secondly, the sports industry is conducive to enhancing enterprises' cohesion, competitiveness, and centripetal force. Finally, the investment impact of the sports industry exceeds the investment impact of a single industry. According to the input-output model, Liaoning, Shanghai, Beijing, Guangdong, and other regions have estimated that the sports industry would drive about 80.818 billion yuan. It could be seen that the sports industry has a strong driving and radiating effect on the Chinese country's economic and social development (Ning et al., 2010). It is beneficial to promote rapid economic development and become a new economic growth point.

– The sports industry promotes the growth of the national economy (Probert et al., 2013). With the rapid development of the Chinese economy, the sports industry occupies an important position in the national economy as an emerging industrial sector. The development speed of the sports industry has far exceeded the average growth rate of GDP in various regions, and some are developed. Regions, such as Beijing, Zhejiang, Guangdong, Liaoning, etc., have accounted for 4.3%, 2.1%, 3.2%, and 1.8% of the added value of the sports industry relatively.

– The sports industry promotes social employment. Increasing employment and reducing

unemployment is important goal of macroeconomic development. Besides, it is also an effective way to build a harmonious society and achieve common prosperity (Rebo, 2012). The role of the sports industry in absorbing employed labor has become increasingly prominent. In 2020, the number of employees in China's sports industry will be 10,000, which is nearly double that of 2018.

Methodology and research methods. This article mainly adopts the comparative analysis and gray correlation analysis methods (Yan and Min, 2018). First, use comparative analysis to understand the development process, development status, and development characteristics of the sports industry in western developed countries (Shifeng, 2013). This study comparatively analyzes the development process, current situation, and existing problems of China's sports industry. Secondly, using gray correlation analysis, the basic idea is to judge whether the relationship is close according to the similarity of the geometric shape of the sequence curve (Yang et al., 2020). The closer the curve is, the greater the correlation of similar sequences. This paper adopts the grey correlation analysis method to analyze the relationship between sports industrialization and economic growth.

The basic idea of gray system theory is to judge the degree of correlation based on the similarity of the geometric shapes of the sequence curves. The closer the curve is, the greater the degree of correlation between the sequences; on the contrary, the smaller.

Determination of reference and comparison sequences, Set Sequence X0=(x0,)(2 x1, x2..... xn and Xi=(xi(1),)1 xi(2), xi(3),..... xi (n) is the reference sequence and comparison sequence of the system, respectively. Among them i=1, 2,3,..., n.

The formula for calculating raw data is as follows:

$$x_i' = \frac{x_i}{x_i(1)} = (x_i'(1), x_i'(2), \dots x_i'(n), i = 0,1,2,3 \dots m \quad (1)$$

The formula for calculating the different series is as follows:

$$\Delta_i(k) = |x_0'(k) - x_i'(k)|, \Delta_i = \big(\Delta_i(1), \Delta_i(2), \Delta_i(3), \dots \Delta_i(n)\big), \quad i = 1,2,3, \dots, m \quad (2)$$

The formula for finding the maximum and minimum difference between the two poles is as follows:

$$M = \max max\, \Delta_i(k), m = \min min\, \Delta_i(k) \quad (3)$$

Finding the correlation coefficient. For calculating the grey correlation coefficient, the resolution coefficient is usually taken ξ=0.5. The formula is:

$$r_{oi} = \frac{min + \xi \max}{\Delta_i(k) + \xi \max}, \xi \in (0,1), \mathrm{K} = 1,2,3 \dots \mathrm{n}; \mathrm{i} = 1,2,3, \dots \mathrm{m} \quad (4)$$

The formula for calculating grey correlation is as follows:

$$r_{oi} = 1/n \sum_{k=1}^{n} r_{oi}(K), i = 1,2,3, \dots m \quad (5)$$

Results. The development of the sports industry is closely related to the development of the economy. This article refers to relevant literature, consult relevant experts, and select the following indicators. The sports industry index is the added value of the sports industry. The relevant indicators of economic development are GDP, gross domestic product per capita, the added value of the tertiary industry, fixed

asset investment in the whole society, employment in the tertiary industry, total import and export, and fiscal revenue, the added value of the sports industry is (X0). As a reference sequence, GDP (X1), GDP per capita (X2), tertiary industry added value (X3), fixed assets investment (X4), tertiary employment (X5), total import and export (X6), fiscal revenue (X7), seven indicators are comparative sequences. The data collected are as follows.

Table 1. Raw data on the index related to the added value and economic development of China sports industry

	2011	2012	2013	2014	2015	2016	2017	2018	2019
X0	988	1265	1555	2100	2220	2740	3136	3575	4044
X1	217656.6	268019.4	316751.7	345629.2	408903.0	484123.0	534123.0	588018.8	635910.0
X2	16602.0	20337	23912	25963	30577	36018	39544	43320	46629
X3	91180.1	115090.9	135906.9	153635.1	180743.4	214589.9	243030.0	275887.0	305810.0
X4	10998.16	137323.9	172828.4	224588.77	251683.77	311485.13	374694.74	446294.09	512020.65
X5	24142.9	24404.0	25087.2	25857.3	26332.3	27281.9	27690.0	29636.0	31364.0
X6	140974.0	166863.7	179921.4	150648.06	201722.15	236401.99	244170.21	258168.89	264244.77
X7	38760.20	5132.78	61330.35	68518.30	83101.51	103884.43	117253.52	129209.64	140360.03

Sources: developed by the authors based on the Statistical Yearbook of China.

This paper defines the correlation degree $0.8 \leq r_0 < 1$ as a high correlation, $0.75 \leq r_0 < 0.8$. For moderate association, $0 < r0 < 0.75$ were low association. According to Table 2, the correlation degree and ranking of the indexes related to the added value of sports industry and economic development in China are fixed assets investment (X4)> fiscal income (X7)> tertiary industry added value (X3), gross domestic product (GDP)> Per capita gross domestic product (X2), total import and export (X6)> tertiary industry employed personnel (X5). Among them has the high correlation between the whole society fixed assets investment, financial revenue, and the tertiary industry added value. The medium correlation is GDP, GDP per capita; the low correlation is total import and export and tertiary employment.

Table 2. Calculation results

Order	Index connotation and unit of measurement	Association Degree	sequence
X1	Gross domestic product (billion CNY)	0.77	4
X2	Per capita gross domestic product (CNY)	0.75	5
X3	Value-added of tertiary industry (Billions CNY)	0.82	3
X4	Investment in fixed assets of the whole society (Billions CNY)	0.91	1
X5	Employment in the tertiary sector (Total people)	0.58	7
X6	Total import and export (CNY 100 million)	0.65	6
X7	Government income (Billions CNY)	0.90	2

Sources: developed by the authors.

The related indexes of added value and economic development of the sports industry in China are as follows. The whole society fixed assets investment (X4)> fiscal revenue (X7)> tertiary industry added value (X3), gross domestic product (X1), per capita gross domestic product (X2), total import and export (X6)> tertiary industry employed personnel (X5). Therefore, the sports industry's expansion needs government and community investment requires government financial investment. It is necessary to insist on government financial investments and social ones as a supplement. It is essential to encourage and drive social capital into the sports industry, support all kinds of sports enterprises, especially in China, promote the development of other related industries, and develop the sports industry with the help of industrialization experience in other fields. Meanwhile, it uses the Belt and Road strategy, strengthening cooperation and development with neighboring countries and improving the sports industry's foreign trade. The government needs more support. Creating more economic wealth and improving social benefits

attracts social workers into the sports industry.

Conclusions. There is a high correlation between the sports industry and economic development. The causal and changing relationship is between the sports industry and economic development. The sports industry should be based on a certain level of economic development. At the same time, the sports industry development to a certain stage will have a «multiplier effect» on the economic development. Since its birth, China's sports industry has played an important role in stimulating domestic demands, promoting economic development and growth, and promoting the construction of socialist spiritual civilization. However, compared with the western developed countries, China's sports industry is still in the initial stage of development, and the sports industry's role in driving economic development is still very limited. Therefore, the development of the sports industry has become a new growth point of economic development. Only by actively adjusting the structure of the sports industry, timely formulating strategic plans for the development of the sports industry, and accelerating the reform of the market value and competition mechanism of the sports industry, the sports industry could play an essential role in economic growth.

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Менеджмент індустрії спорту: забезпечення економічного розвитку країни

У статті зазначено, що у західних країнах, надходження в бюджет країни від індустрії спорту значно перевищують надходження від промислового сектору. Автором наголошено, що індустрія спорту є тригером економічного зростання. Однак, попри те, що індустрія спорту Китаю досягла певного прогресу, вона все ще знаходиться на початковому рівні розвитку. Так, у порівнянні із розвиненими країнами Заходу, темпи розвитку спортивної індустрії Китаю є низькими. Метою статті є встановлення взаємозв'язку між ефективністю функціонування спортивної індустрії та економічним розвитком Китаю. На першому етапі дослідження порівняно процеси розвитку, стан, фактори впливу та наявні проблеми в індустрії спорту для визначення умов, характеристик та внеску індустрії спорту в економічне зростання західних країн. Автором проведено якісний аналіз економіко-соціального впливу індустрії спорту Китаю на рівень його економічного розвитку. На другому етапі емпіричного дослідження застосовано традиційний кореляційний аналіз для визначення взаємозв'язку між доданою вартістю спортивної індустрії Китаю та індексом економічного розвитку на основі розрахунку ступеня кореляції. За результатами дослідження встановлено сильний кореляційний зв'язок між доданою вартістю індустрії спорту та інвестиціями в основні фонди, податковими надходженнями та доданою вартістю сектору послуг; помірний – між ВВП та ВВП на душу населення; слабкий – між показниками імпорту та експорту, а також рівнем зайнятості у секторі послуг. Результати дослідження засвідчили, що інвестиції в основні фонди, податкові надходження, туризм, додана вартість, ВВП, ВВП на душу населення мають значний вплив на підвищення доданої вартості індустрії спорту, тоді як вплив імпорту та експорту, а також рівень зайнятості у секторі послуг є незначним. Враховуючи отримані результати якісного та кількісного аналізу, автор емпірично обґрунтовано наявність кореляційного зв'язку між спортивною індустрією Китаю та рівнем його економічного розвитку. На основі отриманих результатів дослідження сформовано пропозиції для стимулювання обґрунтованого та швидкого розвитку індустрії спорту в Китаї.

Ключові слова: індустрія спорту, економічний розвиток, кореляційний аналіз, кількісний аналіз, сірий метод аналізу.