

Analysis of Tourism Competitiveness of Fujian Province based on Entropy Method

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Abstract

This paper selects 16 secondary indicators from the four levels of economic competitiveness, environmental resources competitiveness, service facilities competitiveness and tourism industry competitiveness, weights the data by entropy method, calculates and compares the tourism competitiveness score and ranking of Fujian Province among the 31 provinces in China, and the results show that the tourism competitiveness of Fujian Province is in the middle and upper reaches of the country, however, compared with other coastal provinces, it is at a disadvantage and needs to be further improved in the competitiveness of service facilities and tourism industry.

Keywords

Tourism Competitiveness; Index System; Entropy Method.

1. Introduction

Under the background of the great development of modern service industry, tourism has attracted more and more attention from various regions at home and abroad. At the same time, tourism has also become an important engine to drive regional economic growth. In May 2021, the opinions of Fujian Provincial People's Government on promoting the high-quality development of tourism put forward the development goal of tourism in Fujian Province: by 2023, the number of tourists in the province will exceed 600 million, the total tourism revenue will exceed 900 billion yuan, and the added value of tourism industry will strive to reach 400 billion yuan, accounting for 7.5% of the provincial GDP. However, there is a certain distribution relationship between tourism demand and tourism destinations in the world, which will inevitably lead to competition among tourism destinations [1]. Therefore, it is necessary to scientifically analyze the tourism competitiveness of Fujian Province and compare it with that of other provinces in China, so as to provide a basis for enhancing the tourism competitiveness of Fujian Province. It is also the objective need to promote the high-quality development of tourism in Fujian Province and build it into an important natural and cultural tourism center.

2. Research Review

In recent years, there has been a wealth of research on tourism competitiveness at home and abroad, and rich discussions have been made on the construction of tourism competitiveness evaluation system [2-3] and the improvement of tourism competitiveness [4]. Domestic scholars analyze the tourism competitiveness of various regions in China from the national, regional and provincial levels, For example, Fu Yunxin et al. (2012) used factor analysis to build a comprehensive evaluation system of tourism competitiveness with 21 indicators, and dynamically analyzed the temporal and spatial evolution characteristics of tourism competitiveness of 31 provinces and cities in China [5]; Li Bo et al. (2019) evaluated the competitiveness level of China's provincial tourism resources and explored its spatial pattern evolution and spatial differentiation [6]; Zhou Li et al. (2015) used entropy weight method to evaluate the tourism competitiveness of cities in the Yangtze River Delta and explore its spatial

differentiation characteristics [7]. However, there are few domestic research results on the tourism competitiveness of Fujian Province, mostly focusing on the comparison of tourism competitiveness among cities in Fujian Province [8-9], which is lack of comparison with other regions in China. Based on this, this paper takes Fujian Province as the research object, constructs a tourism competitiveness evaluation index system, and comprehensively evaluates the tourism competitiveness of 31 provinces and cities in China, This paper compares and analyzes the advantages and disadvantages of tourism in Fujian Province in the domestic market, and puts forward corresponding suggestions to provide reference for promoting the development of tourism in Fujian Province.

3. Construction of Index System

According to the existing relevant research, on the basis of following the scientific, systematic and availability, starting from the four levels of economic competitiveness, environmental resources competitiveness, service facilities competitiveness and tourism industry competitiveness, 16 secondary indicators such as international tourism foreign exchange income and the number of class a scenic spots are selected to construct the tourism competitiveness evaluation index system, as shown in Table 1. The data comes from the China Statistical Yearbook, China Tourism Statistical Yearbook and the statistical bulletin of national economic and social development of all provinces from 2013 to 2020. Due to the lack of data, the data of Hong Kong, Macao and Taiwan are excluded.

In this paper, the entropy method is used to construct the evaluation index system of tourism competitiveness. According to the dispersion degree of each index, the entropy method uses information entropy to calculate and modify the weight of each index. It is an objective weighting method. The calculation process is briefly described as follows:

The first step is to standardize the data. The 16 indicators selected in this paper are positive, so the standardization formula of positive indicators is adopted:

$$x'_{ij}(t) = \frac{x_{ij}(t) - \min_{t_0 \leq t \leq T}(x_{ij}(t))}{\max_{t_0 \leq t \leq T}(X_{ij}(t)) - \min_{t_0 \leq t \leq T}(x_{ij}(t))} \tag{1}$$

Where, i (i = 1,2, ..., 31) refers to provinces (excluding Hong Kong, Macao and Taiwan); j (j = 1,2, ..., 16,) represents the j-th index of tourism competitiveness; t (t = 2013, 2014, ..., 2019) indicates the year; x'ij(t) is the standardized value of the i-th index of j provinces and cities in t; xij(t) is the original data of the i-th index of j region in year t, t0 is the starting year, and T is the total year.

The second step: calculate the specific gravity yij:

$$y_{ij}(t) = \frac{x'_{ij}(t)}{\sum_{i=1}^{31} \sum_{t_0}^T x'_{ij}(t)} \quad (0 \leq y_{ij}(t) \leq 1) \tag{2}$$

The third step: calculate the index information entropy e and information utility d, and the formulas are as follows:

$$e_j = -K \sum_{i=1}^{31} \sum_{t_0}^T y_{ij}(t) \ln y_{ij}(t) \tag{3}$$

$$d_j = 1 - e_j \tag{4}$$

And, $K = \frac{1}{\ln m}$, m is the number of samples.

Finally, the weight of index j is calculated as follows:

$$w_j = \frac{d_j}{\sum d_j} \quad (\sum w_j = 1) \tag{5}$$

Table 1. Weight of tourism competitiveness indicators

Total index	Primary index	Secondary index	weight
Tourism Competitiveness	Economic competitiveness 0.2429	Per capita GDP	0.0622
		Output value of tertiary industry/GDP	0.0589
		Per capita disposable income of urban residents	0.0615
		Per capita disposable income of rural residents	0.0603
	Environmental resource competitiveness 0.1855	Park green area	0.0626
		Number of class A scenic spots	0.0623
		Forest coverage	0.0607
	Service facility competitiveness 0.3062	Number of employees in the tertiary industry	0.0615
		Number of stars rated hotels	0.0610
		Number of travel agencies	0.0617
		Passenger volume	0.0616
		Highway mileage	0.0604
	Tourism industry competitiveness 0.2653	Foreign exchange income from international tourism	0.0698
		Domestic tourism revenue	0.0620
		Receive international tourists	0.0718
		Number of domestic tourists	0.0616

The weight calculation results of each index are shown in Table 1. From the weight ranking of primary indicators, service facilities competitiveness > tourism industry competitiveness > economic competitiveness > environmental resources competitiveness. Tourism activity is a comprehensive service activity, involving multiple industries and long industrial chain, which is closely related to local economic development, transportation, environment, supporting facilities and service quality. From the weight of secondary indicators, the weight of receiving international tourists in the competitiveness of tourism industry is the largest. In recent years, China has continuously deepened the level of opening to the outside world, and international tourism is gradually becoming an important factor affecting tourism competitiveness. In economic competitiveness, the largest weight is per capita GDP. Tourism activities are higher-level needs pursued by people after meeting their basic living needs, which are closely related to the level of economic growth; In the competitiveness of environmental resources, the area of park green space and the number of class A scenic spots have a large weight. The ecological environment and the number of class A scenic spots are very important tourism resources; In

the competitiveness of service facilities, the number of travel agencies and passenger volume account for a large proportion. The development of tourism is inseparable from the corresponding supporting facilities and services.

4. Analysis of Tourism Competitiveness in Fujian

According to the above steps, the tourism competitiveness scores of all provinces in China (excluding Hong Kong, Macao and Taiwan, the same below) from 2013 to 2019 are calculated, and the tourism competitiveness scores of two-time sections in 2013 and 2019 are selected for ranking, as shown in Table 2.

Table 2. Score and ranking of tourism competitiveness of all provinces in China from 2013 to 2019

province	2013	Rank in 2013	2014	2015	2016	2017	2018	2019	Rank in 2019
Beijing	0.3637	5	0.3836	0.4052	0.4450	0.4420	0.4922	0.5252	5
Tianjin	0.1338	26	0.1497	0.1637	0.2389	0.1976	0.2005	0.2139	25
Hebei	0.2320	15	0.2485	0.2624	0.3082	0.3041	0.3258	0.3509	17
Shanxi	0.1498	24	0.1617	0.1768	0.2284	0.2082	0.2338	0.2559	21
Inner Mongolia	0.1674	22	0.1833	0.1993	0.2450	0.2279	0.2399	0.2539	22
Liaoning	0.2883	8	0.2966	0.2865	0.3102	0.3157	0.3363	0.3742	14
Jilin	0.1586	23	0.1663	0.1778	0.2178	0.1953	0.2077	0.2158	24
Heilongjiang	0.1774	20	0.1873	0.1974	0.2274	0.2137	0.2253	0.2314	23
Shanghai	0.2625	12	0.2827	0.3013	0.3467	0.3532	0.3838	0.4105	9
Jiangsu	0.4259	3	0.4446	0.4586	0.4576	0.4997	0.5335	0.5515	3
Zhejiang	0.4481	2	0.4655	0.4803	0.4587	0.5222	0.5539	0.5784	2
Anhui	0.2723	11	0.2934	0.2979	0.3179	0.3351	0.3663	0.3887	13
Fujian	0.2570	13	0.2753	0.2917	0.3176	0.3477	0.3595	0.3894	12
Jiangxi	0.2158	16	0.2335	0.2539	0.2778	0.2997	0.3314	0.3660	16
Shandong	0.4079	4	0.4226	0.4458	0.4397	0.5006	0.5300	0.5474	4
Henan	0.2771	10	0.2899	0.3079	0.3246	0.3540	0.3876	0.4133	8
Hubei	0.2799	9	0.3075	0.3239	0.3372	0.3660	0.3941	0.3998	10
Hunan	0.2960	7	0.3129	0.3241	0.3291	0.3700	0.3891	0.4143	7
Guangdong	0.5633	1	0.5984	0.5998	0.5868	0.6845	0.7295	0.7611	1
Guangxi	0.2058	17	0.2270	0.2491	0.2569	0.2945	0.3353	0.3729	15
Hainan	0.1158	27	0.1244	0.1316	0.1499	0.1503	0.1663	0.1771	28
Chongqing	0.1921	19	0.2122	0.2261	0.2439	0.2645	0.2559	0.3113	20
Sichuan	0.3025	6	0.3163	0.3405	0.3447	0.3851	0.4163	0.4500	6
Guizhou	0.1735	21	0.1923	0.2078	0.2248	0.2654	0.3074	0.3456	18
Yunnan	0.2446	14	0.2729	0.2973	0.2760	0.3431	0.3728	0.3984	11
Tibet	0.0541	29	0.0606	0.0702	0.0890	0.0885	0.1003	0.1204	29
Shaanxi	0.2047	18	0.2218	0.2435	0.2389	0.2818	0.3121	0.3351	19
Gansu	0.1085	28	0.1207	0.1345	0.1263	0.1617	0.1794	0.1872	27
Qinghai	0.0453	30	0.0569	0.0679	0.0679	0.0835	0.0966	0.1199	30
Ningxia	0.0408	31	0.0493	0.0565	0.0636	0.0731	0.0820	0.0918	31
Xinjiang	0.1348	25	0.1409	0.1563	0.1402	0.1740	0.1947	0.2115	26

On the whole, 2013-2019, the tourism competitiveness of all provinces in China has an obvious upward trend. It can be seen that with the development of social economy, tourism activities have increasingly become an important part of people's life, and tourism has also developed into an important driving force to drive regional economic growth. At the same time, from 2013 to 2019, the tourism competitiveness of all provinces generally changed. From the ranking of tourism competitiveness, all provinces experienced upward and downward changes, but the change range was small. From a subregional perspective, there are great regional differences in tourism competitiveness. The top provinces are mainly Guangdong, Zhejiang, Jiangsu, Shandong, Beijing and other places. Most of these provinces are located in coastal areas, with relatively developed economy and prominent geographical advantages. The lower ranking provinces mainly include Tibet, Qinghai, Ningxia and other places. Most of these provinces are located in the central and western regions, with relatively backward economy, imperfect supporting facilities and poor location conditions.

2013 - 2019, the tourism competitiveness score of Fujian Province increased from 0.2570 to 0.3890, with an obvious upward trend. The tourism competitiveness has improved, and the ranking fluctuates around 11-13 in the country. On the whole, the ranking has increased, from 13 in 2013 to 12 in 2019, with a small increase. It is at the middle and upper reaches level among 31 provinces, but compared with other areas along the southeast coast, for example, Guangdong, Shanghai and Zhejiang are at a disadvantage in tourism competitiveness.

Taking 2019 as an example, the competitiveness and national ranking of Fujian Province in four levels of economy, environmental resources, service facilities and tourism industry are analyzed in detail, as shown in Table 3.

In 2019, in terms of economic competitiveness, Fujian Province ranks seventh in China, indicating that its economic competitiveness is in a leading position in China. Fujian Province is located in the southeast coast of China, with superior geographical location and high degree of opening to the outside world. At the same time, the private economy is developed, the residents' income level is high, and the demand for tourism is also high. From the perspective of environmental resource competitiveness, Fujian Province ranks fifth in the country and is rich in tourism resources. In 2019, the forest coverage rate of Fujian Province was 66.8%, ranking first in the country. It has pleasant ecology and superior environment. It has national famous scenic spots such as Wuyi Mountain and Gulangyu Island, and is rich in tourism resources. In terms of the competitiveness of service facilities, Fujian Province ranks 16th in China, especially compared with the surrounding provinces, the competitiveness is relatively weak. It can be seen that service facilities have become an important restrictive factor for the development of tourism in Fujian Province. In terms of the competitiveness of tourism industry, Fujian Province ranks 15th in China and at the midstream level in China, so its competitiveness is relatively weak. Tourism products have strong substitutability. The surrounding provinces such as Guangdong, Zhejiang and Jiangsu are well-known, economically developed and rich in tourism resources, which have attracted a large number of domestic and foreign tourists, leading to the lack of attraction and competitiveness of tourism resources in Fujian Province. Building brands and improving popularity have become an important part of improving the competitiveness of tourism industry in Fujian Province.

Table 3. Tourism competitiveness score of Fujian Province in 2019

Year	economic competitiveness	rank	Environmental resource competitiveness	rank
2019	0.1110	7	0.0877	5
	Service facility competitiveness		Tourism industry competitiveness	
	0.1073	16	0.0833	15

5. Conclusions and Recommendations

On the whole, the tourism competitiveness of Fujian Province is at the middle and upper reaches level in China. Among them, it has an advantageous position in economic competitiveness and environmental resources competitiveness, while it is in the middle position in the country in terms of service facilities competitiveness and tourism industry competitiveness. The advantage is not obvious, especially compared with the surrounding provinces, the competitiveness is weak. To improve the tourism competitiveness of Fujian Province, we should not only give full play to our advantages, but also make up for our shortcomings, so as to accelerate the high-quality development of tourism in Fujian Province.

First, consolidate the original advantages. Fujian Province is in the forefront of economic competitiveness and environmental resources competitiveness. It should maintain its original competitiveness, constantly adhere to opening to the outside world, give full play to the vitality of private economy and stimulate local tourism demand. At the same time, Lucid waters and lush mountains are invaluable assets, adhere to green development and provide consumers with a green and pleasant ecological environment.

Second, improve the level of service facilities. Strengthen the construction of tourism supporting infrastructure and service facilities, and accelerate the construction of transportation hubs and scenic spots. At present, Fuzhou Xiamen high-speed railway is under construction. At that time, it will build a one-hour economic circle between Fuzhou and Xiamen, greatly shorten the travel time between the two places, inject new vitality into the development of Fuzhou Xiamen metropolitan circle, and will also promote the development of tourism economic activities in Fujian.

Third, build a tourism brand and enhance its popularity. Most coastal provinces have strong tourism competitiveness, and tourism destinations have strong substitutability. In order to attract more domestic and foreign tourists, it is necessary to create distinctive tourism brands, deeply tap local tourism resources, improve the marketing system, integrate various online and offline marketing resources, and improve their popularity at home and abroad.

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