

Quantitative Analysis and Development Path of Tourism under the New Development Pattern of Double Circulation Taking Huangshan Scenic Area in Anhui as an Example

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Abstract: At present, the instability and uncertainty of the international big cycle are obviously enhanced. The Central Committee of the Communist Party of China emphasizes that we should speed up the construction of a new "double cycle" development pattern, which also puts forward new requirements for the development of tourism. This paper takes the Huangshan Tourist Scenic Area in Anhui Province as an example to specifically analyze its advantages and problems under the new development pattern of "double circulation", and uses the analytic hierarchy process to make a quantitative analysis of the tourism industry. The results show that the tourism industry should take action in optimizing the supply and demand structure, cultivating professional talents, developing cultural tourism integration, expanding opening and dredging, so as to accelerate the cultivation of a complete tourism domestic demand system, promote the high-quality development of tourism, provide a research basis for further institutional innovation of tourism industry, and also provide guidance and reference for accelerating the construction of a "double cycle" new development pattern.

Keywords: New development pattern, Analytic Hierarchy Process, Quantitative analysis, Implementation path.

1. Introduction

Since the reform and opening up, the total economic volume of China's tourism industry has been rising, becoming a strong driving force for rapid economic development. In recent years, under the multiple impacts of the COVID-19 epidemic and economic and trade friction, China's tourism market has been severely hit, making the industry recovery under the new development pattern of "double circulation" the most important realistic demand at present. In the face of the new development environment, the problems in the distribution of supply and demand, industrial integration, resource optimization and other aspects of the tourism industry are gradually emerging. It is increasingly critical to promote the high-quality, high-level and high-level development of the tourism industry.

Huangshan City, Anhui Province, is rich in tourism resources, has profound historical and cultural heritage, covers various types of resources, and has a very high reputation nationwide. It has the advantage of exploring new development models and promoting the revival of tourism. According to the data of Anhui Provincial Bureau of Statistics, Huangshan City ranks the top in the statistics of the number of tourist attractions in all cities of Anhui Province, including 52 A-level scenic spots and 14 red tourism bases. However, since 2020, the tourism turnover of Huangshan Scenic Area has been decreasing year by year, with the operating revenue of 3018 million yuan in 2019, but only 2289 million yuan in 2021, even lower than the operating revenue of 2525.27 million yuan in 2015.

Scholars at home and abroad have conducted extensive research on the path and strategy of tourism development and achieved rich results. Wang Juanjuan (2020) believes that the

tourism resources of China and the countries along the "the Belt and Road" are complementary, and it is possible to build tourism alliances of the countries along the belt and road, expand the tourism industry chain, and promote the construction of a new development pattern [1]. Liu Qianqian et al. (2021) believed that the development of inbound tourism can significantly promote China's economic growth and is conducive to the construction of a new development pattern through the analysis of data from 107 countries and regions [2]. Liu Hongyan et al. Wang Zhaofeng (2022) believed that it is necessary to analyze from the perspective of political economy that domestic and international markets promote the development of tourism through the economic cycle [4]. Ma Congling et al. (2022) selected six major tourism cities as typical cases to explore the path of building a tourism consumption center city in the future [5]. Guo Wanmin (2022) believes that the construction of a new development pattern of "double circulation" is mainly reflected in the dynamic matching and coordinated development of supply and demand driven by institutional cohesion and dynamic mechanism [6]. Su Yunhuan et al. (2022) believed that technological innovation was essential to promote the development of tourism [7].

Scholars at home and abroad have mostly made qualitative research on the promotion of tourism development by the new development model of "double circulation", focusing on the tourism development factors, tourist satisfaction, and traffic convenience of scenic spots. This paper will focus on quantitative research, build an analytic hierarchy model with the help of big data analysis, conduct quantitative analysis on the development of tourism in Huangshan City, Anhui Province, from a quantitative perspective, and propose the development path and strategy of China's tourism under the

new development pattern of "double cycle".

2. Quantitative Analysis of Tourism Development

2.1. Research Methods

Analytic Hierarchy Process (AHP) is an operational research concept, which decomposes the elements related to decision-making into objectives, criteria, schemes and other levels, so as to analyze the relationship between the elements in the system, establish the hierarchical structure of the system, and conduct qualitative and quantitative analysis on this basis.

AHP model mainly analyzes the relationship between elements, then compares the importance in pairs, constructs a comparison matrix, and finally scalars the subjective judgment of people, establishes a judgment matrix, and conducts comprehensive ranking through the composite weight of elements. According to the practical application, AHP is a very scientific and reliable evaluation model, so this paper applies this model to the evaluation of tourism development in Huangshan City, Anhui Province.

2.2. Quantitative Evaluation

2.2.1. Establishment of Evaluation Index System

According to the characteristics and influencing factors of tourism development in Huangshan City, Anhui Province, and considering the constraints of AHP model on indicators, the AHP evaluation system for priority development of tourism in Huangshan City, Anhui Province, is designed by consulting tourism experts, scholars, Huangshan tourism scenic spot staff, and travel agencies. The specific indicator system is shown in Table 1.

The evaluation index system of tourism development in Anhui Province is divided into three parts. The first level is the target level. The target layer is the priority of tourism development in Hefei, Anhui Province. The second level is the criterion level. The criteria layer is mainly divided into six elements of travel and government measures, which are respectively analyzed from two aspects of supply and demand. The third level is the alternative level. Among them, the six elements of travel are mainly the proportion of "food, living, going, travelling, shopping and entertainment" in the tourism industry. The government measures include government publicity, government policies, tourism practitioners, tourism professional colleges, transportation and communication.

Table 1. Evaluation Index System of Tourism Development in Anhui Province

Target layer	Criterion level	Alternative level
The priority of tourism development	Six elements of tourism	Proportion of food in tourism
		Proportion of living in tourism
		Proportion of going in tourism
		Proportion of travelling in tourism
		Proportion of shopping in tourism
		Proportion of entertainment in tourism
	Government measures	Government publicity
		Government policy
		Tourism practitioners
		Tourism colleges
		Traffic communication

2.2.2. Construction of Judgment Matrix and Consistency Test

In the AHP model, each element of the upper level has a judgment matrix to the lower level, through which the importance of each element of the lower level to the upper level can be judged. For example, suppose that the "government measures" of the middle layer is B₂, and assume that the government propaganda, government policies, tourism practitioners, tourism professional colleges, and transportation communications are C₁, C₂, C₃, C₄, and C₅ respectively, and a corresponding judgment matrix is constructed as follows:

$$\begin{bmatrix} C_{11} & \cdots & C_{15} \\ \vdots & \ddots & \vdots \\ C_{51} & \cdots & C_{55} \end{bmatrix} \quad (1)$$

Where, C_{ij} (i, j=1, 2, 3, 4, 5) represents the numerical expression of the relative importance of C_i to B₂. Generally, C_{ij} takes 1, 3, 5, 7, 9 and their reciprocal. The meaning of this value is as follows: 1 indicates that C_i and C_j are equally important; 3 indicates that C_i is slightly more important than C_j; 5 indicates that C_i is significantly more important than C_j; 7 indicates that C_i is more important than C_j; 9 indicates that

C_i is extremely important than C_j. The intermediate values 2, 4, 6, 8 represent the intermediate state of adjacent judgment. Similarly, "Priority type of tourism development in Huangshan City, Anhui Province" is set as A, and "six elements of tourism" is set as B₁. A establishes a 2 × 2 judgment matrix the travel six elements B₁ should establish a 6 × 6 matrix.

The internal assignment of the matrix is in the form of filling in the form of tourism experts, scenic spot staff, etc. to construct their judgment values. Through the software YAAHP, the corresponding data processing is carried out for the matrix. Since the consistency test must be carried out before using the judgment matrix to calculate the weight, so as to ensure the rationality of the results obtained by the AHP model, the formula for calculating the consistency is:

$$CI = \frac{\lambda_{\max} - n}{n - 1} \quad (2)$$

Where, λ_{max} is the maximum eigenvalue of the judgment matrix, and n is the order of the matrix (n ≥ 2). The RI value is generated by the computer. You only need to find the corresponding average random consistency index value and compare it with CI. RI values are shown in Table 2:

Table 2. Average random consistency index RI of judgment matrix

N	1	2	3	4	5	6	7	8	9
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45

Table 3. Judgment matrix and corresponding weight distribution of priority types of tourism development

Priority development type	Six elements of tourism	Government measures	Wi
Six elements of tourism	1.0	5.0	0.8
Government measures	0.2	1.0	0.2

Using YAAHP software to carry out a series of analysis, we can get that the six tourism elements and government

measures are consistent with the consistency test, that is, we can carry out the next series of operational analysis.

Table 4. Results of consistency inspection

	Six elements of tourism	Government measures	Consistency inspection
Six elements of tourism	0.8333	0.1667	Pass
Government measures	0.2	0.8	Pass

2.2.3. Calculation and Analysis of Weight

According to the specific requirements of the AHP model, after establishing the judgment matrix and passing the

consistency test, this part should carry out the corresponding calculation and analysis of the weight. The judgment matrix and its calculation results are shown in Table 5, Table 6 and Table 7.

Table 5. Judgment matrix and weight of six elements of tourism

Six elements of tourism	Food	Living	Going	Travelling	Shopping	Entertainment	Wi
Food	1.0000	0.3333	0.3333	0.2500	0.5000	4.0000	0.0829
Living	3.0000	1.0000	0.5000	0.5000	4.0000	3.0000	0.1935
Going	3.0000	2.0000	1.0000	0.5000	4.0000	4.0000	0.2558
Travelling	4.0000	2.0000	2.0000	1.0000	4.0000	4.0000	0.3381
Shopping	2.0000	0.2500	0.2500	0.2500	1.0000	0.5000	0.0671
Entertainment	0.2500	0.3333	0.2500	0.2500	2.0000	1.0000	0.0627

Table 6. Judgment matrix and weight of government supply

Government measures	Government publicity	Government policy	Tourism practitioners	Tourism colleges	Traffic communication	Wi
Government publicity	1.0000	4.0000	4.0000	0.5000	0.3333	0.2048
Government policy	0.2500	1.0000	0.5000	0.2500	0.2500	0.0638
Tourism practitioners	0.2500	2.0000	1.0000	0.5000	0.5000	0.1111
Tourism colleges	2.0000	4.0000	2.0000	1.0000	0.5000	0.2552
Traffic communication	3.0000	4.0000	2.0000	2.0000	1.0000	0.3651

Table 7. Final weight of target layer

Alternative level	Wi
Proportion of food in tourism	0.0663
Proportion of living in tourism	0.1548
Proportion of going in tourism	0.2046
Proportion of travelling in tourism	0.2705
Proportion of shopping in tourism	0.0537
Proportion of entertainment in tourism	0.0502
Government publicity	0.0410
Government policy	0.0128
Tourism practitioners	0.0222
Tourism colleges	0.0510
Traffic communication	0.0730

2.3. Analysis of Evaluation Results

It can be seen from Table 3 that the weight of the six tourism elements is higher than the government measures.

Therefore, we must pay attention to the needs of tourists and focus on the needs, so as to strengthen the development of tourism and drive economic progress. Among the six elements of tourism, the "tourism" part is the most important

in the above level analysis, which shows that tourists are increasingly concerned about the ornamental, historical and cultural values of the scenic spots. The second is "travel". It can be seen that the better the traffic conditions are, the higher the development degree of the scenic spot is. Among the policy measures, government publicity and transportation account for the largest proportion. It can be seen from this that the government should increase the policy preference for the tourism industry, actively put advertisements on various platforms, and then pay attention to improving the transportation convenience to facilitate tourists' travel. The training of professional talents in professional colleges also accounts for a large proportion. It should be advocated to set up tourism management majors in major colleges and universities, so as to provide them with a large number of professional talents.

3. The Development Path of Tourism

As a comprehensive industry with a high degree of openness, tourism is also an important engine to drive economic development. China's tourism industry should take action in optimizing the supply and demand structure, cultivating professional talents, developing cultural and tourism integration, expanding openness and dredging, etc., so as to promote the tourism industry to achieve high-quality development.

3.1. Optimize the Structure of Supply and Demand

In the new stage of tourism development, the demand of tourists is diversified and of high quality. In the face of this new changing feature of the tourism industry, the tourism industry not only needs to reconsider the industrial form of tourism, but also actively promote the reform of the tourism industry. In the two major tourism markets at home and abroad, the tourism content should be deepened, the historical value and cultural value of the tourist attractions should be explored, and the relevant industrial chain should be extended to meet the tourist demand.

3.2. Cultivate Professional Talents

In the current era of advanced science and technology and the multiplication of talents, tourism related industries have come into people's sight as non-traditional industries. We should set up relevant tourism majors in universities to provide talent support for tourism. At the same time, the government needs to provide more financial support for this major, so that students can better use digital technology to transform and upgrade traditional scenic spots, and use professional knowledge to contribute to the development of tourism.

3.3. Develop Cultural and Tourism Integration

The new stage of integration and development of culture and tourism is mainly related to cultural identity. Tourist attractions need to take the initiative to connect with cultural nodes to make the integration of culture and tourism more refined and refined. The culture and tourism industry is a comprehensive industry, and its development needs to involve

many management departments, which is difficult to supervise. This requires us to further strengthen the reform of the management system and the innovation of the working mechanism, form a scientific management system, and define the responsibilities and work requirements of each department.

3.4. Expanding Openness

China's development cannot be separated from the world, nor can the development of the world be separated from China. As one of the five permanent members of the United Nations, China adheres to the concept of a community with a shared future for mankind, and places the development of China's tourism in the development of the world's tourism industry. We should actively promote the "the Belt and Road", establish innovative tourism development pilot sites along the belt and road, give full play to its unique geographical advantages, further open up the tourism investment field, better attract global tourism resource elements, and promote the development of international and domestic tourism.

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