An analysis of response coupling relationship between supply-demand inbound tourism flow drive and urban destinations

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Abstract

Inbound tourism is an important way for a country or region to earn foreign exchange and resolve the employment problem. The development of inbound tourism can not only measure the local economic development level, but also measure the international level of the tourism industry. In this paper, supply and demand in economics is taken as a foothold. By constructing the corresponding system model between inbound tourism flow and urban destinations, it analyzes the coupling relationship between inbound tourism flow and urban destinations.

Keywords: supply and demand, inbound tourism, coupling relationship

1 Introduction

The successful development of the tourism industry requires maintaining a balanced state between tourism supply and demand, both of which are the basic structures of the tourism system and also interact with each other. Hence, the research into the supply and demand relationship of tourism should not be limited to one side [1-4]. The research should be established upon a coupling model, such as exploring the relationship between the hotel industry and tourism flows, and exploring that between attraction of provincial destinations and tourism flows.

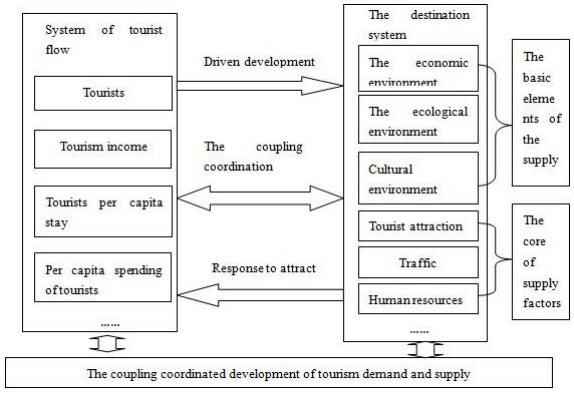

FIGURE 1 Coupling relationship frame between the tourist flow and destinations

Tourist flow as a visible form of tourism demand has a mutual influence and coupling relationship with destinations. Both achieve a win-win situation through a coordinated development and virtuous cycle process. On the one hand, tourist flow brings a large number of tourists who thereby stimulate the economy in the destinations and have played an important positive role in promoting the development of the destinations [5-7]. On the other hand, destinations can increase their core competitiveness and raise attraction to the tourist flow by upgrading their core supply factors and basic supply elements. The basic supply elements incorporate protection of the ecological environment, cultural development and prosperity and regional economic development level [8-10], while core supply elements encompass tourism resource development, construction of infrastructure industry service facilities, transportation, service quality and investment of tourism resources. Accordingly, the coupling relationship between tourism flows and urban destinations is that, along with the development of tourism, both influence each other and promote the sum of the non-linear relationship, as shown in Figure 1.

Based on the above analysis, this project takes the remote western region as a case for study. With the coupling theory basis, it analyzes the situation and law of inbound tourism of the western provinces, so as to provide some theoretical data for China's tourism industry.

2 Research methods

Currently, in terms of statistical data on tourism, domestic statistical methods have not been mature and academic yet, while this study discusses the relation between inbound tourism data flow and tourism destinations. This paper first utilizes the coupling model for quantitative coupling coordination of inbound tourism data flow to tourist destinations, and then conducts a study of spatiotemporal difference law by cluster analysis.

2.1 CONSTRUCTION OF THE EVALUATION MODEL OF COMPREHENSIVE DEVELOPMENT LEVEL

The weighted method is employed to evaluate the comprehensive development level of inbound tourism data flow and destinations. The Equation is as follows:

$$u_i = \sum_{j=1}^{k_i} \lambda_{ij} u_{ij} , \sum_{j=1}^{k_i} \lambda_{ij}=1, \quad (1)$$

where, u_i represents the comprehensive development level of System i; u_{ij} represents the index value of Feature j in

System i; λ_{ij} represents the weight of Indicator j in System i; k_i shows the number of indicators in ixit. Among these indicators, u_{ij} is obtained by nonzero transformational range standardization Equation, which is:

$$u_{ij} = \frac{x_{ij} - \min（x_j）}{\max(x_j) - \min（x_j）} \times 0.99 + 0.01, \quad (2)$$

where when u_{ij} refers to negative indices, its Equation is:

$$u_{ij} = \frac{\max(x_j) - x_{ij}}{\max(x_j) - \min（x_j）} \times 0.99 + 0.01, \quad (3)$$

where, x_{ij} represents the original data value of the indicator j in System i. After normalization treatment, u_{ij} is obtained, ranging from [0.01,1].

2.2 EVALUATION MODEL OF COUPLING COORDINATION DEGREE

Relying on the capacity coupling model in physics, a coupling coordination degree evaluation model is built concerning the relationship between inbound travel data flow and destinations:

$$C = \{（u_1 \times u_2）/[\prod(u_1 + u_2)]\}^{1/2}, \quad (4)$$

where C represents the system coupling degree; u_1 and u_2 stand for the comprehensive development level of the inbound tourism data flow system and the comprehensive development level of the destination system. Speaking from the definition of the coupling degree, its presentation is the strength of the relationship between the systems, but it does not reflect the coordination development level between the systems. To this end, we must also introduce the coupling coordination degree model for the systems:

$$D = \sqrt{C \times T}, T = \alpha u_1 + \beta u_2, \quad (5)$$

where D represents the system coupling coordination degree; T represents the comprehensive evaluation indices of the two systems; α and β represent the number of undetermined weights.

In fact, to promote the local tourist economy boom and improve the overall development level of tourist destinations should not only rely on inbound tourism, but also self-construction. That is, in both systems, the destination system plays a more important role. After consulting with experts, we have determined the specific values for two undetermined weights as α=0.37, β=0.63.

In regard to the evaluation of the coupling coordination degree between the two systems, we first need to analyze the integrated development level of the inbound tourism data flow system and the destination system through the model, in which the smaller system development value is corresponding to the lagging system. Afterwards, relying on "absolute rating" constructed by Liao Zhongbin, the degree of coupling coordination between the two systems is judged, and the space for destination tourism economic development is dug out.

2.3 HIERARCHICAL CLUSTERING METHOD

To further explore the differences in “absolute rating", the differences in coupling coordination degree between the two systems are explored and the data are processed by using SPSS software. The D value for each year is conducted a hierarchical cluster analysis. The mean value for the Euclidean distance between two inter-phase data points is taken as the classification standard for the clustering results. This breaks the standard of using absolute coupling coordination level to divide the boundary, which helps analyze the relative differences of coupling coordination degree of the provinces.

3 Evaluation of coupling coordination degree between western inbound tourism and urban destinations

3.1 CONSTRUCTION OF THE EVALUATION INDEX SYSTEM

In accordance with four principles including comprehensiveness, science, accessibility and comparability, an evaluation index system is built between tourist flows and destinations. Passenger flow is the subject and foundation for tourist flow. The systematic development level of inbound tourism flow can be measured by the number of inbound tourists, tourists per day, foreign exchange earnings for inbound travel and per capita spending of inbound tourists. Due to the wide coverage of urban destinations, the evaluation system of the destination system is constructed from six aspects, which are the economic environment, human environment, ecological environment, transportation, and tourism attractions. In addition, these six aspects are refined into 32 indicators, as shown in Table 1.

TABLE 1 Indicator system and weight of inbound tourism data flow and urban destination coupled system

Systems & Elements		Basic Indexes	Weight
Inbound tourism data flow system		Number of inbound tourists	0.288
		Day of inbound tourists	0.310
		Foreign exchange earnings of inbound tourism	0.290
		Per capita consumption of inbound tourists	0.110
Provincial destination system	Economic environment	Per capita GDP	0.136
		Urban per capita disposable income	0.159
		The proportion of tertiary industry in GDP	0.072
		Total retail sales of consumer goods	0.183
		Gross fixed asset formation	0.226
	Ecological environment	Industrial waste water emissions	0.130
		Industrial waste gas emissions	0.111
		Industrial soot emissions	0.132
		Industrial SO2 emissions	0.174
		Forest coverage rate	0.283
		Per capita public green areas	0.168
	Cultural	Number of performing	0.186

	environment	arts groups	
		Number of performing arts venues	0.149
		Number of mass cultural institutions	0.152
		Number of public libraries	0.092
		Quantity of operators in cultural market	0.190
		Culture expenses	0.229
	Attractions	High-level scenic attraction abundance	0.150
		High-level scenic spot quality	0.221
	Traffic	Number of popular clubs	0.190
		Star hotel beds	0.197
		Fixed assets of tourism enterprises	0.240
		Civil aviation passenger volume	0.255
		Highway passenger volume	0.162
		Per capita urban road area	0.227
		Traffic quantity per million people	0.118
		Number of taxes	0.107
	Human resources	Proportion of tertiary industry employees	0.222
		Number of hotel employees	0.370
		Number of travel agency employees	0.406

3.2 DATA PROCESSING AND EVALUATION

By using Equations (2) and (3), standardization and entropy weighting method of raw data are calculated. The weights are shown in Table 2. Afterwards, the data that have gone through standardization processing were put into Equations (1), (4) and (5), which draw the comprehensive development level and specific values of inbound tourism flow and urban destinations, as well as a table about coupling coordination degree. After analysis of these tables, we can draw the following conclusions:

1) The integrated development level of inbound tourism flow and the destination systems presents overall growth and optimization trends. Compared with the previous data, in recent years the u_1 values of almost all provinces and cities in China are growing steadily at an increase rate of about 1.5, more than 1time, in addition to individual cities showing a declining trend.

2) It is still universal that cities in western parts are still relatively lagging and continuously expanding supply and development. By comparing u_1 and u_2 for years, western cities generally displayed inadequate demand in the early stage, and inadequate supply in the later stage, such as inadequate supply in Chongqing and Kunming in 2010. Demand lag is a historical characteristic left over in the western region, while supply lag appears and is expanding in recent years. Therefore, to improve the inbound tourism situation in western cities, work should be focused on promoting the development of effective demand, which is to continue to optimize the supply structure and enhance the overall development level of destinations.

3) Coupling coordination degree grows slowly at a low level.

The biggest development problem in regard to coupling coordination degree in the western region is slow development. Even if for Xining in Qinghai that has the largest increase, the increase rate is only 0.65 times, while the smallest increase is only 0.12 times. Also, the provinces and cities as a whole show a low coupling coordination degree. In 2000, 45% of the coordination level is dominated by mild imbalance; 17% is serious imbalance; 25% is moderate imbalance, and 12% is on the verge of imbalance. There is an increase in recent years, and the coordination degree is subjected to higher levels on the whole. When then the gap between them is still too large, reluctant coordination mainly accounts for 50%; moderate imbalance occupies 17%; mild imbalance occupies 25%, and 8% are on the verge of imbalance. Although there is a great improvement compared to the past, the coupling coordination development level between inbound tourism flow in the western region and the urban destination system still needs to make huge progress, and still does not enter the coordination development level.

4) With the narrowing gap between the development levels of urban destinations, the systematic development level of the inbound tourism flow determines the development of coupling coordination degree. Cities with large coupling coordination degree tend to develop inbound tourism well, such as Chengdu, Xi'an and other transportation hub cities, which are passages connecting the eastern and western regions. The rest areas including Kunming and Guilin are also node cities located in the country's inbound tourism core. Despite that Inner Mongolia is remote, it is connected with Russia and Mongolia, and so it witnesses the rapid development of border tourism. Other cities with low coupling coordination degree are basically on the verge of the tourism flow network and lack of tourist core nodal cities.

4 Analysis of coupling coordination degree in western cities

The coupling coordination development level between inbound tourism flow and urban destinations in provinces and cities in western China has not yet entered the stage of coordination development, demonstrating a low level of development, although this situation has improved in recent years.

The development of inbound tourism demand is generally lagging in China's western region. A lack of effective demand and lagging supply are the main reasons that constrain the development of inbound tourism development in the western region. Hence, to change the status quo of western inbound development, the first thing to do is to vigorously stimulate effective demand and promote the development of effective demand by increasing the overall development level of destinations and optimizing the supply structure.

In the western region, provinces such as Yunnan, Sichuan, Chongqing, and Shaanxi have a high coupling coordination degree, while Tibet, Qinghai, Gansu and Xinjiang have a low coupling coordination degree. Basically Hu Huanyong Line is taken as a dividing line, and provinces east of Hu Huanyong Line have a higher

coupling coordination degree than the western provinces.

There are large regional differences in the degree of coupling coordination in the western region. In respect of geographic classification, the southwest reflects high coupling coordination degree, insignificantly regional differences and relatively balanced development, while the northwest shows low coupling coordination degree and significantly regional differences. In respect of provincial classification, as a whole, Yunnan, Sichuan and Guangxi display higher coupling coordination degree than other western provinces, and there is a small difference and stable development. Shaanxi and Chongqing have relatively lower coupling coordination degree and show an uprising and active development trend. Although Qinghai and Ningxia do not have very high degree of coupling coordination, the development trend is obvious, and the coupling coordination degree of other provinces is relatively low and the development is relatively weak.

There is a gap in the development level of inbound tourism flow among different provinces in the western region, thus resulting in regional differences in terms of the coupling coordination degree, and this difference presents a polarization state. At the same time, the destination status of inbound tourism flow cities and whether there are core tourism cities are also an important factor affecting the coupling coordination degree in each province, and such differences exist not only within the provincial western region, but also in the whole tourism area.

5 Conclusion

When developing inbound tourism, in addition to considering their own unique tourism resources, cities must also better understand the psychology of inbound tourists. Only by truly understanding their motivations and aspirations can they suit the remedy to the case in regard to tourism project development, international tourism marketing and tourism services, so as to achieve better balance between supply and demand.

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