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# An Exploratory Analysis on Reform and Innovation of Tourism Industry—Inspired by the Model of West Lake, China

QI Yan-bin, LI Jing-jing\*, YIN Ling-xiao

School of Economics and Management, Sichuan Agricultural University, Ya'an 625014, China

**Abstract** Firstly, the paper introduces some researches on the development of tourism in Sichuan by researchers at home from a perspective of policies, pointing out that in these researches on tourism development in Sichuan, innovative breakthroughs are lacking. Secondly, by studying on total retail sales of social consumer goods of Sichuan and Hangzhou these 2 places, tourism incomes and the number of tourists at home, selecting the degree of tourism dependence, the contribution rate of tourism to economy and the growth rate of economy which tourism brought these 3 standards, and according to some related statistics of Sichuan from 2002 to 2009, the paper makes a detailed study on influences of tourism on economy by means of Grey Relational analysis in terms of small samples and inadequate information. And analyzing the rates of dependence, contribution and pull coefficient of tourism on economy by comparing Sichuan with Hangzhou these 2 places. The results show that the influences of tourism on goods consumption of Hangzhou is much bigger than that of Sichuan. The degree of dependence of GDP in Hangzhou is bigger than that in Sichuan. Except in 2006 and 2007, the contribution rate of tourism on economy and the power of accelerating of tourism of Hangzhou is bigger than that of Sichuan. And finally, this paper proposes that the government should increase the investment in places of scenic beauty and improve the management of the scenery to accelerate the development of tourism of Sichuan.

**Key words** Tourism, Pull coefficient free admission, Grey Relative Theory, China

Sichuan covers a large territory with abundant natural and cultural landscapes, attracting lots of tourists with its special travel resources every year. Since 1999, Sichuan has been viewing the tourism as the pillar of industries, expecting to stimulate consumption and optimize the industrial structures to accelerate a good and healthy development of the economy of Sichuan. While the proportion of the total tourism income of Sichuan to the whole country is very low, especially the source of international tourists ranking far behind. The low proportion does not match the status of Sichuan which is famous for tourism. According to statistics, with the free admission of West Lake of Hangzhou to the public in 2002, tourism revenue of Hangzhou has increased dramatically. Some other related industries such as catering and retailing and so on have developed rapidly. The loss of free admission to West Lake can be made up by other gains from relative industries. Based on the true fact that the tourism in Sichuan is bleak and the resources have not been made a good use, the paper, depending on the experience of free admission to West lake in Hangzhou, has made a discussion on some measures which would be taken in the process of free admission to Sichuan by comparing the influences of tourism revenue on economy of Hangzhou and Sichuan.

## 1 Literature review

Some researchers have carried out studies on the development of tourism in Sichuan. Fu Guanghai, from a perspective of policies, made a discussion on the development of tourism in Sichuan, putting forward a development strategy

centering on creating a world-class, national brand, aiming at attracting international tourists, having natural and cultural tourism as the main line, realizing the historic changes from a province famous for tourism resources to one well known for tourism revenue, and finally to a province famous for its strong tourism economy to accelerate the development of economy<sup>[1-2]</sup>. Fan Huaichao, from a perspective of policies and measures, proposes that it needs not only to improve the tourism infrastructure and reinforce the propagation of the place, but also to cultivate the related personnel, optimize the tourism management in order to attract more tourists with some fresh points<sup>[3]</sup>. Feng Liping, *etc.* based on the competitiveness of tourism in Sichuan, made some qualitative object evaluations. By making a qualitative and quantitative analysis on the competitiveness of tourism in Sichuan with empirical statistics, she explores the issues that need improvement and put forward some policies in upgrading the competitiveness of tourism in Sichuan<sup>[4-5]</sup>. Bai Bingfei, *etc.* firstly using input-output theory and adopting Ripple Effect analysis, analyzed qualitatively the roles of Sichuan tourism playing in industries development and the degrees of dependence and support to other relative industries<sup>[6]</sup>.

## 2 Data acquisition, index selection and research methods

**2.1 Data acquisition** Because the West Lake has been open free to the public since 2002, the data collected in both areas starts from 2002. All the resources are from *Sichuan Statistical Yearbook*, *Sichuan Statistical Yearbook of Tourism*, *Hangzhou Statistical Yearbook*, *Hangzhou Statistical Yearbook of Tourism* from 2002 to 2009.

**2.2 Index selection** When analyzing the degrees of contribution of tourism to the local economy of Sichuan and Hang-

zhou, for so many indexes used to measure the standards of tourism and material limited, the paper select the following 3 factors of Sichuan and Hangzhou as the objects: total retail sales of consumer goods, tourism revenue at home, the number of tourists at home. By contrasting the following indexes, the paper analyzes the grey relevance of local tourism revenue and the number of tourists to the local economy.

**2.2.1** Dependence of tourism revenue. To some degree, this index reflects that the positive influences of tourism on the relative industries and the ripple effects of tourism revenue. Of course, it also reflects the degree of its attendance in national division of labor, the depth of tourism realization and the influences of industrial scale on the national economy. And the formula is:

$$DR_t = \frac{Y_t}{GDP_t} \times 100\% \quad (1)$$

In the formula,  $DR_t$  is the dependence of tourism revenue,  $GDP_t$  is the GDP at that time,  $Y_t$  is the total revenue of tourism.

**2.2.2** The contribution of tourism revenue to economy. This index, to some degree, shows the quality and efficiency of tourism. And it also reflects the adjustment of tourism to the regional economy and the degree of influences on accelerating the local economy and so on. The formula is:

$$GR_t = \frac{Y_t - Y_{t-1}}{GDP_t - GDP_{t-1}} \times 100\% \quad (2)$$

In this formula,  $GR_t$  is the contribution rate of tourism to economy,  $Y_{t-1}$  is the total amount of tourism revenue of last year,  $GDP_{t-1}$  is the GDP of last year.

**2.2.3** The pull effects of tourism revenue on economy. This index shows the influences of tourism on national economy and reflects its vitality, its leadership compared with other industries. The formula is:

$$LR_t = YR_t \times GR_t \times 100\% \quad (3)$$

In the formula,  $LR_t$  is the pull influences of tourism revenue at home on economic increment,  $YR_t$  is the GDP increment at that time.

**2.3 Research methods** Because tourism is a large and complex system, it is rather difficult to define all the factors included and interaction mechanisms among them. Besides the data collected is not abundant, so, firstly, analyzes the influences of tourism revenue on economy with Grey Realtive Theory, which is based on a small sample and limited information. Then by comparing the increment and pull coefficient of tourism brought on the local economy in Sichuan and Hangzhou, analyzes the influences of tourism on the local economy.

**2.3.1** Specify the reference column and column of data to be compared. Viewing the total retail sales of social consumer goods as the reference column  $Y_0(t)$ , the tourism revenue  $Y_1(t)$  and the tourists  $Y_2(t)$  as the column of data to be compared.

**2.3.2** Processing the original data with dimensionlessness and initialization,

$$X_0(t) = \frac{Y_0(t)}{Y_0(1)} \quad (4)$$

In the formula,  $X_0(t)$  is the dimensionless result of the total retail sales of social consumer goods  $Y_0(t)$ ,  $t = 1, 2, \dots, n$ ;  $Y_0(t)$  is the total sum of retail sales of consumer goods in  $t$  year,  $Y_0(1)$  is the sum of consumer goods of 1 year, the research started from 2001, so 2001 is viewed as the first year.

$$X_i(t) = \frac{Y_i(t)}{Y_i(1)} \quad (5)$$

In the formula,  $t = 1, 2, \dots, n$ ;  $i = 1, 2$ ;  $t = 1$ ,  $X_i(t)$  is the dimensionless result of the national tourism revenue  $Y_1(t)$ ,  $t = 2$  is the dimensionless result of tourists at home  $Y_0(t)$ ,  $i = 1$ ,  $Y_i(t)$  is the total tourism revenue of  $t$  year,  $i = 2$ ,  $Y_i(t)$  is the number of tourists of  $t$  year,  $i = 1$ ,  $Y_i(1)$ , is the total tourism revenue of the first year,  $i = 2$ ,  $Y_i(1)$  is the number of tourists of the first year. Similarly, here, we view 2001 as the first year in research.

**2.3.3** Coefficient calculation in Grey Theory. The coefficient equation of column  $X_0(t)$  and column  $X_i(t)$  is:

$$\xi_i = \frac{\min_i \min_t |X_0(t) - X_i(t)| + 0.5 \max_i \max_t |X_0(t) - X_i(t)|}{|X_0(t) - X_i(t)| + 0.05 \max_i \max_t |X_0(t) - X_i(t)|} \quad (6)$$

$|X_0(t) - X_i(t)|$  in the formula refers to the differences between features series of  $Y_0$  system and relative factors  $Y_i$  at the  $t$  point.

**2.3.4** Relative calculation column. The mean of relative coefficients  $X_i(t)$  is called the relevance of sub-series  $X_i(t)$  to master-series  $X_0(t)$ , and written as:

$$r_i = \frac{1}{N} \sum_{t=1}^n \xi_i(t) \quad (7)$$

In the formula,  $i = 1, 2$ ;  $i = 1$ ,  $\xi_i(t)$  is the Grey Relative Coefficient of the national tourism revenue  $Y_1(t)$  and the total retail sales of social consumer goods  $Y_0(t)$ .  $i = 2$ ,  $\xi_i(t)$  is the Grey Relative Coefficient of the number of tourists  $Y_2(t)$  and the total retail sales of social consumer goods  $Y_0(t)$ .  $i = 1$ ,  $r_i$  is the Grey Relative Coefficient of the total sum of tourism revenue  $Y_1(t)$  and the total retail sales of social consumer goods  $Y_0(t)$ . And  $i = 2$ ,  $r_i$  is the Grey Relative Coefficient of the number of tourists  $Y_2(t)$  and the total sum of retail sales of consumer goods  $Y_0(t)$ .

## 3 Conclusion and analysis

**3.1 Grey relative calculation** Calculating respectively the total retail sales of consumer goods, the national tourism revenue and the number of tourists at home of Hangzhou and Sichuan these 2 places through formula (4) to (7), then we gain the grey relevance table of tourism revenue and tourists of Hangzhou and Sichuan to the total retail sales of consumer goods. From the Table 1, we know that from 2001 to 2008, the relevance of tourism revenue and the number of tourists to the retail sales of consumer goods are 0.64 and 0.68, both of which are larger than that of Sichuan. This shows a fact that the influences of tourism to consumption in Hangzhou are bigger than that in Sichuan. The pull effects of tourism on consumption in Hangzhou are stronger than that in Sichuan. Also, it suggests that with the pull of tourism, other relative industries in Hangzhou, such as catering and retail, have developed faster than

those in Sichuan, the revenues brought by tourism in Hangzhou are much higher than that in Sichuan.

**Table 1 The grey relevance of tourism revenue and tourists at home to the total retail sales of social consumer goods from 2001 to 2008**

Region	Tourism revenue at home	The number of tourist at home
Sichuan	0.60	0.67
Hangzhou	0.64	0.68

**3.2 A comparing analysis of dependence, pull coefficient and increment** According to the table of tourism revenue of Hangzhou, Sichuan at home in from 2001 to 2008, and by calculating with the formula (1) to (3), we may get that from 2001 to 2008, the degree of dependence of tourism brought to

**Table 2 GDP and the tourism revenue from 2001 to 2008 of Hangzhou and Sichuan these 2 places** billion

Year	Sichuan		Hangzhou	
	GDP	Y	GDP	Y
2001	429.35	30.00	156.80	21.89
2002	472.50	36.40	178.18	25.48
2003	533.30	40.80	209.97	29.00
2004	637.96	54.20	254.31	36.11
2005	738.51	69.56	294.26	46.51
2006	863.78	94.79	344.15	47.62
2007	1 050.53	117.99	410.01	54.86
2008	1 250.60	107.73	478.11	61.72

**Table 3 The pull coefficient and contribution rate of tourism to the local economy of Sichuan and Hangzhou from 2002 to 2008** %

Year	The degree of tourism dependence		The contribution rate of tourism to economy		The pull effect of tourism on economy	
	Sichuan	hangzhou	Sichuan	hangzhou	Sichuan	hangzhou
2002	0.08	0.14	0.15	0.18	0.01	0.02
2003	0.08	0.14	0.07	0.11	0.01	0.02
2004	0.08	0.14	0.13	0.16	0.02	0.03
2005	0.09	0.16	0.15	0.26	0.02	0.04
2006	0.11	0.14	0.20	0.02	0.03	0.01
2007	0.11	0.13	0.12	0.11	0.02	0.02
2008	0.09	0.13	-0.05	0.10	-0.01	0.02

**3.2.1 A comparing analysis of dependence.** From the chart 1, we know that from 2002 to 2008, with the propotion of the tourism revenue to GDP of Sichuan ranked only 8 percent, only in 2006 and 2007 was 10.97 percent and 11.23 percent. While in Hangzhou, the propotion of tourism revenue to GDP keeps double digit from 2002 to 2008. And in 2005, it reaches to 15.8 percent. So obviously, tourism in Hangzhou covers a more important role than that in Sichuan. The dependence of GDP on tourism in Hangzhou is higher than that in Sichuan.

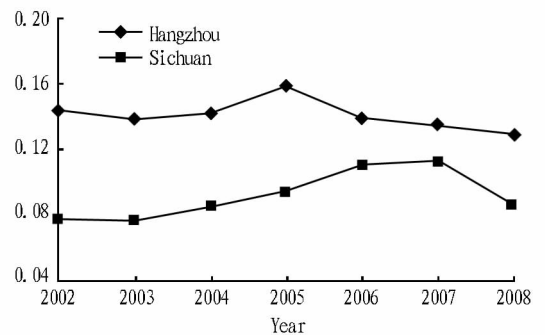
**3.2.2 A comparing analysis of pull coefficient.** From the chart 2, we know that the pull effects of tourism on economy in Sichuan had been raising before 2007, while the speed was very low. The pull coefficients of tourism in Hangzhou are all higher than that in Sichuan except in 2006 and 2007. So mostly the pull effects of tourism on economy in Hangzhou is larger than that in Sichuan.

**3.2.3 A comparing analysis of increment of economy.** From the chart 3, in terms of increment of economy, we know that, comparing with Hangzhou in the same period, Sichuan averagingly is lower than Hangzhou except in 2006 and 2007. And the margin has become larger and larger. And in 2002, the increment in Sichuan is lower than that in Hangzhou by 3 percent, and in 2008 it reaches to 10.5 percent. Based on this, the increment in Sichuan has been declining year by year. Compared with Hangzhou, the increment in Sichuan of tourism to economy is lower.

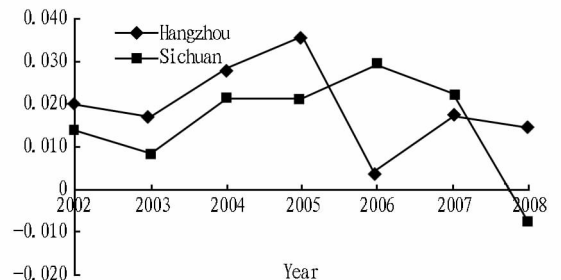
**4 Countermeasures and suggestions**

From the perspective of Sichuan tourism, although there is growth in the total revenue, the pull effects and the increment

economy, the pull coefficient and the increment of tourism to economy. Their changing trend is like the following chart:



**Fig.1 Comparison of the tourism revenue dependence of Hangzhou and Sichuan from 2002 to 2008**



**Fig.2 Comparison of pull coefficient of tourism revenue of Hangzhou and Sichuan from 2002 to 2008**

have been declining year by year in 2007 and 2008. It shows that with the development of economy of Sichuan, the increment of tourism to economy becomes smaller and smaller. From 2002 to 2008, the propotion of tourism to GDP in Sichuan is lower than that in Hangzhou in all aspects. In terms of pull

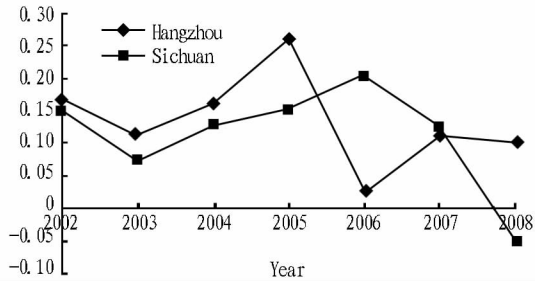


Fig. 3 The contribution rate of tourism of Hangzhou and Sichuan

effects of tourism on economy, the margins between Hangzhou and Sichuan become larger and larger, which does not match the situation that Sichuan is a province rich in natural resources. Therefore, if Sichuan wants to open freely to the public like Hangzhou to change the bleak phenomena and gains the same effects of Hangzhou, it should adopt measures as the following:

**4.1 Intensifying the financial scenic subsidies** With the government's admission of free entrance to scenery, the revenue must decline and the managing costs of cleaning and security would be increased. So it is difficult for the revenue to take charge of it. So, the government should allocate a full financial aid to solve the problems of costs, acting in concern with the province, region, district and town with the principle of classification charge and subsidize the daily management costs.

**4.2 Perfecting the scenic management** There will be a series of problems appeared with the free admission to the public. In order to assure the tourists that they would have a healthy and ordered activity and at the same time would not destroy the sustainable development, the tourists attraction sectors should promote market-oriented park operations and enrich travel services. And at the same time, reasonable planning and con-

struction are also needed. It is necessary to improve the service quality, increase the revenue and cut the operation costs.

**4.3 Strengthening the propaganda and promoting civilized travels** With the free admission to the public, there will be more tourists and some who are poor qualities. All of which may lead to a larger force in handling problems, such as the cleaning and the security. Therefore, speeches and posts are needed to raise the public awareness, enhance the knowledge of loving and maintaining green and advocate civilized travels.

**4.4 Opening minds, pursuing innovation** Policy of free admission is a kind of overall planning management at the level of large tourism, high development. Only the managers update the managing ideas and outdate the managing methods, making use of resources with great costs and energy and designing a new mode for profits, then it can succeed.

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## 四川省旅游业改革创新探析——基于杭州西湖模式的启发

漆雁斌, 李静静\*, 殷凌霄 (四川农业大学经济管理学院, 四川雅安 625014)

**摘要** 首先,介绍了国内学者从政策角度对四川省旅游业发展的研究,指出这些研究四川省旅游业发展的改革没有创新性的突破。其次,以四川与杭州2地的社会消费品零售总额、国内旅游收入、国内旅游人数作为研究对象,选取旅游收入依存度、旅游收入对经济的贡献率、旅游收入拉动经济增长率3个指标,依据2002~2009四川省相关数据,通过“样本小、信息量不完全”的灰色关联度分析方法探讨了游收入对经济的影响作用,对比分析了四川、杭州2地旅游业对经济增长的依存度、贡献率和拉动系数。结果表明,杭州市旅游业对消费的影响作用要大于四川省旅游业对消费的影响作用;杭州市GDP对旅游业的依赖程度高于四川省;除2006、2007年2年外,大多数年份杭州旅游业对经济的拉动作用和贡献率大于四川省。最后,提出了政府加大对景区的财政补贴力度、完善景区管理等对策,以期促进四川旅游业的发展。

**关键词** 旅游业;拉动系数;免费开放;灰色关联度