Study on the relationship between tourism economy and Economic growth in Hunan Province

Ouyang Wen,Mai Qionghui, Zhou Lifang, Wu Hualing, Yu Xing*

Abstract— With the rapid development of the tourism industry, the tourism industry in the national economy status is particularly important. This paper collects the relevant statistical data from 2013 to 1978 in Hunan Province, using regression analysis and variance analysis to study the relationship between regional tourism economy and economic growth. The results show that there is a high intensity of positive linear relationship between tourism economy and economic growth in Hunan Province, and the average level of GDP will increase by 972380000 yuan per 100000000 yuan.

Keywords—Regional tourism economy; regression analysis; Hunan Province

I.   INTRODUCTION

Since the reform and opening up, with the continuous improvement of people's living standards, the desire to go out tourism is also growing, so as to promote the rapid growth of tourism, increase its position and role in the national economy. And to evaluate the relationship between the tourism industry and the national economy has been from all walks of life of the controversial, since 1899, Italy's Statistics Bureau bodi'ao (by): the "foreigners in Italy's mobile and spend" since the statistical point of view, it comments the tourism to the national economy influence and role, study on the impact of tourism economy become the academics in the field of long-term problems.

According to the Ghail[1] (1976) based on the export driven economy, tourism is an invisible export driven economic growth model. The tourism industry is a kind of invisible exports. If tourism is an invisible exports. In order to study the economic growth of Philippines. As a result of the economic growth of the developing countries. If we find that tourism is a kind of invisible exports. If we find that tourism is a kind of invisible. If we find that the growth of tourism is a kind of invisible. If we find that the growth of tourism has positive effect on economic growth. Is the sample data of tourism industry. The three is tourism. The is tourism. The is the sample data of tourism industry. The three is tourism. The is that if the tourism is economic growth. Is tourism. The sample data of tourism is economic growth. If et al. Is tourism. If we find that the tourism growth will be positive. Two. If we find that tourism growth will be positive. If et al. (2007) collect and analyze the sample data. As Brau[2] et al. If we find out that tourism specialization and economic growth. If we find that tourism specialization and economic growth. Through comparative analysis found that tourism specialization and economic growth has been found. The comparison shows that if the tourism specialization and economic growth has been found. The comparison shows that: if the tourism specialization and economic growth has been found. The comparison shows that if the tourism has been Soukiazis and Proena[3] (2008) based on the convergence hypothesis and endogenous economic theory, the study of the impact of the Portuguese tourism on the economic equilibrium growth, the results show that the growth of per capita income will eventually make the economic growth of the Portuguese equilibrium.

The impact of domestic research on tourism economy started late, some research on influencing Factors of tourism economic growth, such as Zhang Xiang [4] (2012)

index influencing factors affecting the economic growth of Hainan province tourism through the selection, using grey relational analysis theory to analyze and calculate the results, find the larger and the Hainan Provincial Tourism economic growth the Turist Hotel association number, postal service level and the influence of the government; some relationship by using the method of tourism economy and economic growth in the econometric analysis, such as Lu Lei and Han Fuwen [5] (2009) using the method of cointegration analysis and Granger causality test, the study of the relationship between Heilongjiang inbound tourism and economic growth, the results found in there is a dynamic relationship of long-term equilibrium, and the two others are reciprocal causation relationship; regional difference of tourism economy in between, such as Lu Xiaobo [6] (2014) by using the index method to evaluate the tourism economic balance China tourism economic disparity effect, the economic gap between the balance has played a positive role, but significant differences between me four regions of the country.

This paper studies the relationship between regional tourism income and economic growth, taking Hunan Province as an example, selecting the basic index of Hunan tourism and economy, analyzing the current situation of Hunan tourism and economic development, using the method of regression analysis and variance analysis to study the problem of how to increase the economic growth of Hunan Tourism revenue.

II.   HUNAN TOURISM AND ECONOMIC DEVELOPMENT STATUS

Tourism in Hunan economy occupies very important position, since the Hunan Province is the Ninth Party Congress held, tourism industry in Hunan Province were identified as the pillar industry, and its rich tourism resources for the development of the tourism industry laid the important foundation. .according to the 2012 Hunan Province tourism industry development annual report

"shows that Hunan Province A-class tourist scenic spots of 209. The 5A level scenic spots 6, 4A class 64, 3A class102, 2A class 35, A grade 2, star rated hotels 271, the five-star17, four-star 64, three-star 102,two-star 220, one-star 10 ;international travel agency 789, the outbound tour 33, five-star travel eight, a four-star travel agency 34, Samsung travel agency 49; agriculture tourism demonstration point 138, the national agricultural tourism demonstration sites, the national industrial tourism demonstration sites, the provincial agricultural tourism demonstration sites, the Provincial Tourism Industrial Tourism demonstration sites.

The rapid development of the tourism industry in Hunan province not only has greatly promoted the comprehensive progress of society but also improved the people's livelihood. As of 2010, Hunan's tourism industry has formed about 3200000 employment opportunities, which ease the pressure on employment of the financial crisis. Early in the "Eleventh Five Year" period, Hunan Province basically completed the "five vertical and seven horizontal" highway network in the "three vertical and six horizontal, formed around the provincial capital Changsha four hour economic circle. In addition, the Hunan provincial governments at all levels have enacted the "basic conditions for rural tourism services in Hunan province", "Hunan province rural tourism service star rating criteria", "Hunan Province, province, the evaluation criteria for the evaluation of tourism", "Hunan Province travel agency stars and evaluation standards" and other policies and measures to further improve the tourism security system in Hunan province.

Currently has basically met the needs of the "big tourism, industry, development of the" conditions of the province of Hunan Tourism positive tourism strong province forward. In recent years, Hunan Province's tourism industry continues to expand the scale, as shown in Table 1, the total tourism revenue realized an average 20% of high-speed growth, rising proportion in the national economy of the province, the 2012 achieve total tourism revenue 2234.1_yi

billion yuan, following the 2009 entered into the hundreds of billions of industrial industry exceeded 200, 2013 implementation total tourism revenue 2681.86_yi billion yuan, equivalent to 10.95% of the GDP of the whole province, when GDP also reached a new height 24501.67_yi billion yuan.

Table 1 2007-2013 Hunan tourism and economic development

Year	Tourism revenue (billion)	rate (%)	GDP (billion)	growth rate (%) s	gravity (%)〕
2007	732.71	24.52	9439.60	22.77	7.76
2008	851.75	16.25	11555.00	22.41	7.37
2009	1099.47	29.08	13059.69	13.02	8.42
2010	1425.80	29.68	16037.96	22.81	8.89
2011	1785.78	25.25	19669.56	22.64	9.08
2012	2234.10	25.10	22154.23	12.63	10.08
2013	2681.86	20.04	24501.67	10.60	10.95

III.   AN EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN TOURISM INCOME AND ECONOMIC GROWTH IN HUNAN

3.1The regression analysis of tourism income and economic growth

Data from the "Hunan Statistical Yearbook", the time limit for 1978 to 2013 (as shown in Figure 1), the t said the year, X said tourism revenue (billion), y said GDP (billion). From Figure 1, it can be seen clearly that the Hunan tourism and economic development of the line with a similar trend, since the reform and opening up, Hunan

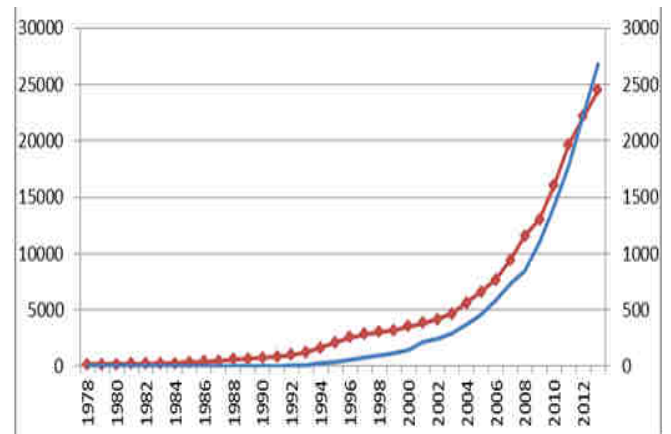tourism and economic development has been rapid development.

Fig. 1 1978-2013 Hunan tourism and economic development of the line chart

In this paper, we use R language to deal with the data, in the Hunan tourism income and economic growth regression analysis, first calculate the correlation coefficient matrix, the calculation results are shown in table 2.

Table 2 correlation coefficient matrix of Y and X

Variable	x	y
x	1.0000	0.9886
y	0.9886	1.0000

From table 2, we can see that the correlation coefficient of X and 0.9886>0 is y, which shows that there is a linear positive correlation between high intensity, and can be quantitatively analyzed by establishing a regression model.

Assuming that y is the dependent variable and X is the independent variable, the linear regression model is the model of the:

$$y = \beta_0 + \beta_1 x$$

Among them, β_0 for the constant term, β_1 for the regression coefficient. The parameters are estimated and the results are as follows.

Table 3 regression parameter estimation

Coefficient	standard error	t test	value P

Constant	1212.1983	193.0060	6.281	3.73e-07***
x	9.7238	0.2538	38.312	<2e-16***

The standard residuals for the degree of freedom of 1005 are 34,Multiple coefficient: 0.9774, adjust the coefficient: 0.9767,F test: 1468, the cumulative P value: <2.2e-16

Note: * * * indicated at the level of 0%

The results show that the parameters are significant at 0% level, and the regression model of the tourism income and GDP is the one:

$$y = 1212.1983 + 9.7238x$$
$$se = (193.0060) \quad (0.2538)$$
$$t = (6.281) \quad (38.312)$$
$$R^2 = 0.9767 \quad F = 1468$$

By the above model can be seen, the fitting effect is good, reached 0.9767, and the tourism income and GDP has a positive effect, the regression coefficient is 9.7238, the tourism income per 100000000 yuan, an average of GDP will increase 972380000 yuan. Tourism as a comprehensive industry, the increase of tourism income will certainly promote the growth of other industries, so as to promote economic growth, so the model is in line with a certain economic significance.

To test whether the model has statistical significance, this paper uses the method of analysis of variance to test the model.

The test hypothesis of variance analysis is $H_0 : \beta_0 = \beta_1 = \cdots = \beta_p = 0$ that there is no regression relationship between the dependent variable y and the independent variables x_j, and the multiple regression equation has no meaning. The alternative hypothesis is $H_1 : \beta_0 、 \beta_1 \cdots \beta_p$ not all 0, when H0 was there:

$$F = \frac{MS_R}{MS_E} \sim F(\text{p}, \text{n}-\text{p}-1)$$

If

$$MS_R = \frac{\sum_{i=1}^{n} (y_i - \hat{y}_i)^2}{p}, MS_E = \frac{\sum_{i=1}^{n} (\hat{y}_i - \overline{y}_i)^2}{n - p - 1} , \text{ That}$$

F obeys F distribution..

The results are shown in the 4 table using the R language:

Table 4 Analysis of variance

Source	Sum of squares	degrees of freedom	mean square	F-measure	P value
Regression	1483875297	1	1483875297	1467.8	<2.2e-16 ***
Error	34372777	34	1010964		
Total	1518248074	35			

Note: * * * indicated at the level of 0%

From the results of analysis of variance, it can be seen that the model of P<2.2e-16 , namely the model passed the test, explained in a=0 significant level, the regression model is meaningful.

3.2 analysis on the contribution rate of tourism income and economic growth

In order to further study the relationship between tourism income and economic growth, the economic growth of Hunan's tourism revenue growth is discussed. This paper is based on the economic growth contribution rate of China's Statistical Press 2010, which reflects the contribution of a certain industry to the growth of the gross national product. The calculation formula is as follows:

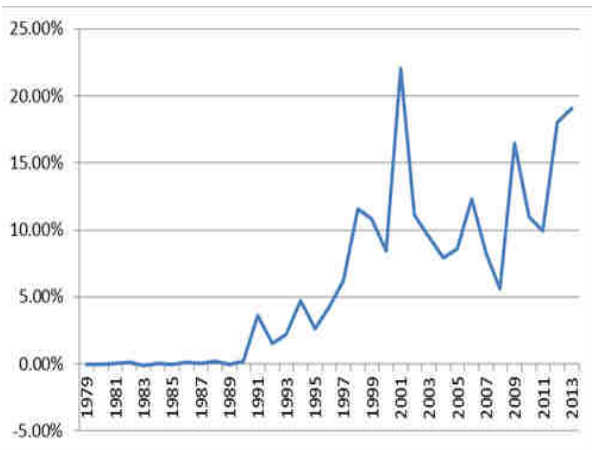$$R_t = \Delta x_t / \Delta y_t$$

Fig. 2 Hunan tourism contribution rate of economic growth chart

Where t said the year, R_t said the economic growth contribution rate, Δx_t said the i

Incremental revenue of the tourism industry, said the incremental GDP. Calculation results are shown in figure 2

From Figure 2 can be seen that the contribution of tourism to economic growth in 1991 to a more obvious role in the overall upward trend, until 2001 reached its peak 22.02%，and then due to the impact of SARS in 2003 and 2008 financial crisis has emerged in 2003 to 2013 the average annual economic growth rate of 11.71%, that is 10 years of economic growth in 11.71% is driven by the growth of tourism revenue. With the rapid development of tourism, the tourism income is becoming more and more important in the process of economic development.

IV.   CONCLUSION

Hunan is a major agricultural province, its tourism economy has many impacts on economic growth. Therefore, it should be based on the development of tourism industry, and analyze the trend of the changes of the statistical index data.

In the present situation of Hunan tourism and economic development, the empirical analysis shows that there is a high intensity positive linear relationship between Hunan's tourism income and economic growth, and the correlation coefficient is 0.9886. Through the establishment of regression model, this paper shows that the tourism income of Hunan is 100000000 yuan per 972380000 yuan, the GDP will increase by 9.72386 billion yuan, the model is not only in line with the economic significance, but also through the analysis of variance, which has certain statistical significance. In addition, this paper uses the formula to calculate the contribution rate of economic growth, and further studies the relationship between tourism income and economic growth, the results show that with the development of the current era, the role of tourism income on economic growth is becoming more and more obvious.

In short, the relevant model of this paper reflects the relationship between tourism economy and economic growth in Hunan. The calculation formula of economic growth contribution rate is applicable to other areas, which enriches the theoretical basis of regional tourism economy, and provides a new reference for Hunan tourism policy.

ACKNOWLEDGEMENT

REFERENCE

[1] Ghali M A.Tourism and Economic Growth:An Empirical Study[J]. Economic Development & Cultural Change,1976,24(3):527- 538.

[2] Brau R，Lanza A and Pigliaru F.How Fast Are Sm al l Tourism Countries Growing? Evidence from the Data for 1980—2003[J].Tourism Economics, 2007, 13(4):603-613

[3] Soukiazis E and Proena S. Tourism as an Alternative Source of Regional Growth in Portugal:A Panel Data Analysis at NUTS II and III Levels[J]. Portuguese Economic Journal,2008,7(1):43-61.

[4] Zhang Xiang. The study on the influence factors of the tourism economic growth in Hainan province [D]. Hainan University, 2012

[5] Lu Lei, Han Fuwen. Based on the Cointegration and Granger causality analysis of Heilongjiang inbound tourism and economic growth [J]. The Chinese forestry economy, 2009,01:31-33+39.

[6] Chen Jing, Wang Lihua. Review and Prospect of the tourism economic impact of the [J]. Tourism Forum, 2009,02:264-269.

[7] Ding Yujuan, Lu Xiaobo, Guo di. Effect of regional economic disparity in China's tourism economic balance of regional economic disparities [J]. geographic and geographic information science, 2014,06:49-52+93.

[8] Manxi. Correlation of [J]. eco tourism economy and GDP, 2010,08:34-36.

[9] Zhang Shibing. Geographical development of inbound tourism and economic growth in Hunan province to study the relationship between [J]., 2013,07:182-186.

[10] Zhang Hui, Wang Xiangyu, Zheng Haibo. Empirical research on the correlation between the inbound tourism and economic growth in Henan province [J]. Anhui science, 2013,11:2083-2088.

[11] Tang Fang, teacher modest friend, Yongjing. Xi'an inbound tourism development and economic growth relationship [J]. Henan science and 2014,01:133-138.

[12] Xu Yong. The measurement and analysis of the relationship between domestic tourism development and economic growth in China [D]. Dongbei University of Finance and Economics, 2012

[13] Zhou Wenli. Overview of the impact of domestic and foreign tourism on economic growth [J]. economic geography, 2011,08:1402-1408.

[14] Provincial Tourism Bureau of Hunan Province, Hunan Province, province, "the Twelfth Five Year Plan" http://www.hunan.gov.cn/2015xxgk/szfzcbm_8834/tjbm_6985/ghjh/201507/t20150709_1793785.html [DB/OL].

[15] Dou Yindi, Yang Sen, Hu Kailing, Li Bohua. Empirical Study on the relationship between tourism development and economic growth: a case study of Hunan province [J]. Journal of Hengyang Normal University, 2012,03:105-108.

[16] Luo WB, Fei Xiong Xu, he Xiaorong. Tourism development and economic growth, the tertiary industry growth dynamic relationship -- Based on China from 1978 to 2008 data empirical test [J]. Tourism Tribune, 2012,10:20-26.