

Urban Tourism Management and its Influence

Suya Liu

Shanghai University, Jiading District, China

18717862115@163.com

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Abstract: The relationship between tourism management and urban economic growth has always been an important theme in the study of tourism economy. In this paper, in order to study the influence of tourism on economic growth, we selected the Cobb-Douglas production function, and tourism variables are introduced into the accounting equation of production function. The logarithm is taken to obtain the linear model $\ln Y = \ln A + \alpha \ln K + \beta \ln L + \gamma \ln T + \mu$ as the basis of the study. Then, based on the availability of each index data, this paper selects the GDP output of 16 provinces, cities and autonomous regions in Beijing, Shanxi Province, Inner Mongolia Autonomous region, Liaoning Province, Jilin Province, Shanghai, Jiangsu Province, Zhejiang Province, Anhui Province, Fujian Province, Jiangxi Province, Shandong Province, Henan Province, Hunan Province, Guangdong Province and Guangxi Zhuang Autonomous region from 2008 to 2017 as the explained variables. The total fixed assets investment of the whole society, the annual employment of labor force and the total income of tourism are used as explanatory variables to explore the impact of tourism on the economic growth of provinces, cities and autonomous regions. According to the panel data processing method and modeling process introduced in this paper, the LLC, IPS, ADF, PP stationarity test of the collected panel data is carried out, but because of the characteristics of the data in this paper, no cointegration test is carried out. Finally, the regression model of panel data is determined, the fixed effect model is selected, and the conclusion is drawn: on the premise that labor and capital remain unchanged, each additional unit of total tourism revenue will boost total economic production by 0.266 points. Thus, it can be seen that urban tourism management has a great impact on urban GDP.

1. Introduction

China has a vast territory, with thousands of years of splendid civilization history and beautiful scenery with its own characteristics, which constitutes a very rich tourism resources, has a strong attraction for domestic and foreign tourists, and provides a good basis for the development of tourism.

Since more than 30 years of reform and opening up, China's tourism industry has achieved rapid development. According to the statistics released by the World Tourism Organization (UNWTO), the number of overnight tourists in China increased from 3.5 million in 1980 to 57.5807 million in 2011, rising from 18th to third in the world, and the foreign exchange earnings of international tourism increased from US \$617 million in 1980 to US \$48.464 billion in 2011, and the world ranking rose from 34th to 4th. It is estimated that by 2020, China will form the largest domestic tourism market in the world and the largest outbound tourism market in the world. The added value of tourism accounts for more than 5% of (GDP). Tourism has really become a strategic pillar industry of the national economy. However, in the process of tourism development, there are not without problems, such as Greece, Zhangjiajie and Jiuzhaigou scenic spots, which were the first to fall in the debt crisis. These economies, which are supported by tourism, are better than their own producer services are underdeveloped, infrastructure and human resources are not matched, coupled with the fragility of tourism, resulting in a series of negative effects. It is mainly manifested in the instability of economic development, the crowding out of other industries, the leakage of tourism income, and the problem of resource curse. So, what is the impact of tourism management on a

city's economic growth?

In this paper, we selected Beijing, Shanxi Province, Inner Mongolia Autonomous region, Liaoning Province, Jilin Province, Shanghai, Jiangsu Province, Zhejiang Province, Anhui Province, Fujian Province, Jiangxi Province, Shandong Province, Henan Province, Hunan Province, Guangdong Province and Guangxi Zhuang Autonomous region as our explained variables. The total fixed asset investment of the whole society, the annual employment of labor force and the total income of tourism are used as explanatory variables to explore the impact of tourism on the economic growth of various provinces, cities and autonomous regions. Some of the better developed provinces, such as Beijing, Shanghai and Guangzhou, and some relatively slow-growing provinces, such as Henan and Inner Mongolia, can be used to roughly observe the impact of tourism on the economic growth of various provinces and cities in China. That is to say, whether the development of tourism management really plays a certain role in the economic growth of a city, and how much influence is it.

2. Panel Data

Panel data, which refers to the tracking of data from the same group of individuals over a period of time. It contains three-dimensional information of cross-section, time and index. The panel data model can be used to construct and test a more real behavior equation than the previous use of cross-section data or time series data alone, and can be analyzed more deeply. It is based on the needs of actual economic analysis, as a non-classical econometrics problem, at the same time, the use of cross-section and time series data model has become one of the important methods of theoretical analysis of tourism economics in recent years.

2.1 Panel Data Processing.

The stationarity of panel data has a great impact on the accuracy of regression results, the instability of data series will lead to a great deviation of the results, often appear "pseudo-regression" phenomenon. Therefore, before doing the analysis, it is necessary to test the stationarity of the panel data, the most commonly used stationarity test is the unit root test:

$$y_{it} = \rho_i y_{it-1} + X_{it}' \beta_i + u_{it}, \quad i = 1, 2, \dots, N \quad t = 1, 2, \dots, T_i \quad (1)$$

Which X_{it} represents the exogenous variable vector of the model, including the fixed influence and time trend of each cross section. N denotes the number of individual cross-section members, T_i denotes the number of observation periods of the i cross-section member, the parameter ρ_i is the coefficient of autoregression, and the random error term u_{it} satisfies the assumption of independent and identical distribution. Then for the AR (1) process represented in Eq.1, if the corresponding sequence y_{it} is a stationary sequence, if the corresponding sequence y_{it} is a stationary sequence, the corresponding sequence y_{it} is a non-stationary sequence. Unit root test is the method to test whether y_{it} is a stationary sequence or not.

For the different restrictions of the parameter ρ_i in Eq.1, the unit root test of panel data can be divided into two categories: one is the unit root test in the case of the same root. This kind of test method assumes that each cross-section sequence in the panel data has the same unit root process, that is, suppose that ρ_i is a constant in Eq.1. The common test methods for unit root test in the case of the same root are LLC (Levin, Lin & Chu), IPS and so on. The other is the unit root test in the case of different unit roots. This kind of test method allows each cross-section sequence in the panel data to have different unit root processes, that is, the ρ_i is variable in Eq.1. The unit root test is commonly used in the case of different unit roots, such as Fisher-ADF, Fisher-PP and so on. For ordinary sequences, only the ADF test can be carried out, but for panel data, the same unit root test and different unit root test should be carried out. If the original hypothesis of unit root is rejected in both tests, it is proved that the sequence is stationary and vice versa.

Cointegration test is a precaution to investigate the long-term equilibrium relationship between variables. The so-called cointegration means that if two or more non-stationary variable sequences, the sequence after a linear combination is stationary. At this point, we say that there is a

cointegration relationship between these variable sequences. Therefore, the requirement or premise of cointegration is the same order simple integration, and the cointegration test can be carried out only if it is found that the variables are of the same order based on the results of unit root test. If some of the data are stable and some are not stable, after the difference processing of the unstable data, it is no longer necessary to carry out the cointegration test.

The cointegration test methods of panel data can be divided into two categories, one is panel cointegration test based on Engle Granger two-step test, the specific methods are Pedroni test and Kao test, and the other is panel cointegration test based on Johansen cointegration test. If the cointegration test is passed, it shows that there is a long-term stable equilibrium relationship between the variables, and the regression residual of the equation is stationary. Therefore, on this basis, the original equation can be directly regressed, and the regression results are more accurate.

2.2 Selection of Regression Model for Panel Data.

There are usually three forms of panel data model selection: one is the Pooled Regression Model. If there is no significant difference between different individuals in terms of time, and there is no significant difference in cross-section, that is to say, for different areas of cross-section, the regression equation is the same, that is, the intercept term and slope term are the same, then the panel data can be mixed together and the parameters can be estimated by ordinary least square method (OLS). The second one is the Fixed Effects Regression Model. If the intercept of the model is different for different cross sections or different time series, the method of adding virtual variables to the model can be used to estimate the regression parameters. The last one is the Random Effects Regression Model. If the intercept term in the fixed effect model includes the average effect of the cross section random error term and the time random error term, and the two random error terms obey the normal distribution, the fixed effect model becomes a random effect model. In the selection method of panel data model, we often use F test (the original hypothesis is mixed model is valid, alternative hypothesis is fixed effect effective) to decide whether to choose mixed model or fixed effect model, and then use Hausman test (the original hypothesis is random effect effective, alternative hypothesis is fixed effect effective) to determine whether random effect model or fixed effect model should be established.

3. Empirical Analysis

3.1 The Model.

The driving force of economic growth mainly comes from the input of various factors, mainly refers to the increase of potential national output or the growth of economic system production capacity. In this paper, GDP is used to measure the economic growth of provinces and cities. According to the neoclassical economic growth theory, economic growth depends on three factors: Labor, capital and technological progress. The purpose of this paper is to explore the impact of tourism on economic growth, the general model of economic growth is the Cobb-Douglas production function:

$$Y = AK^{\alpha}L^{\beta} \quad (2)$$

Which Y is the total output; K is the capital stock, which represents the fixed assets investment stock in the economy, that is, material capital; L refers to human capital, that is, labor force input; A is the factors that affect output growth in addition to material capital and human capital, such as technological innovation, industrial structure adjustment, institutional innovation and so on. α and β refer to the output elasticity of material capital and human capital. Represents the contribution of each input growth to output growth. In this paper, a production function accounting equation which includes tourism factors is established as an empirical econometric model. If the tourism variable is introduced into the production function accounting equation, the growth accounting equation is:

$$Y = AK^{\alpha}L^{\beta}T^{\gamma} \quad (3)$$

Which T is the total income of tourism, and γ is the output elasticity coefficient of tourism. Considering the economic significance of the data, the logarithm is taken from the left and right sides of the pair at the same time, and we can obtain the linear model :

$$\ln Y = \ln A + \alpha \ln K + \beta \ln L + \gamma \ln T \quad (4)$$

Which α , β and γ represent the input-output elastic coefficient of each factor, and further replace the correlation coefficient μ , then the model equation is:

$$\ln GDP = \beta_0 + \beta_1 \ln K + \beta_2 \ln L + \beta_3 \ln T + \mu \quad (5)$$

Then based on Eq.5, we can calculate the contribution of tourism management to the scale of urban economic growth.

In this paper, We selected Beijing, Shanxi Province, Inner Mongolia Autonomous region, Liaoning Province, Jilin Province, Shanghai, Jiangsu Province, Zhejiang Province, Anhui Province, Fujian Province, Jiangxi Province, Shandong Province, Henan Province, Hunan Province, Guangdong Province and Guangxi Zhuang Autonomous region as explained variables. The total fixed assets investment of the whole society, the annual employment of labor force and the total income of tourism are used as explanatory variables to explore the impact of tourism on the economic growth of provinces, cities and autonomous regions. Among them, the data of GDP output, total fixed asset investment of the whole society and annual employment of labor force come from the official website of the National Bureau of Statistics, and the data of the total annual tourism revenue of various provinces, municipalities and autonomous regions come from the statistical yearbooks of various provinces, municipalities and autonomous regions from 2008 to 2017. The logarithm of the data is taken with Eviews 8.0. thus, the data are comparable, and the statistical description of the variables is shown in Table 1.

Table 1 Descriptive statistics of variables

| Variables | lnGDP | lnL | lnK | lnT |
|-----------|--------|--------|--------|--------|
| Mean | 4.3385 | 2.7735 | 4.1333 | 3.4252 |
| Median | 4.3031 | 2.7554 | 4.1425 | 3.4638 |
| Maximum | 4.9528 | 3.2951 | 4.7420 | 4.0534 |
| Minimum | 3.8079 | 2.3889 | 3.5479 | 2.6540 |
| S.d. | 0.2674 | 0.2258 | 0.2876 | 0.3199 |

The S.d. represents the Standard deviation

3.2 Model Checking and Setting.

First of all, let's do the unit root test on the data as follows:

Table 2 The unit root test

| Variables | LLC test | IPS test | ADF test | PP test |
|-----------|-------------------------|------------------------|------------------------|------------------------|
| lnGDP | -8.3481*** (0.0000) | -2.1804** (0.0146) | 52.1818** (0.0136) | 128.757*** (0.0000) |
| lnL | -6.2835*** (0.0000) | -0.8942 (0.1856) | 35.8102 (0.2942) | 56.5177*** (0.0048) |
| lnK | -14.2096*** (0.0000) | -4.4647*** (0.0000) | 87.1015*** (0.0000) | 154.834*** (0.0000) |
| lnT | -5.4353*** (0.0000) | -4.2074*** (0.0000) | 47.1021** (0.0389) | 87.7958*** (0.0000) |

** and *** indicate significant at 5% and 1% confidence levels, The number in parentheses is p-value

As can be seen from Table 2, the sequences in the panel data are not entirely stationary. For example, lnL, so we need to perform a differential operation on the lnL :

Table 3 Difference results of lnL

| lnL | LLC test | IPS test | ADF test | PPtest |
|-------------------------|-------------------------|------------------------|------------------------|------------------------|
| First order difference | -3.3916*** (0.0003) | -0.5993 (0.2744) | 32.5630 (0.4391) | 36.5291 (0.2663) |
| Second order difference | -15.8653*** (0.0000) | -6.7074*** (0.0000) | 113.866*** (0.0000) | 123.294*** (0.0000) |

Table 3 shows that the second-order difference of lnL is stable. Here, a new variable sequence d2lnL is generated to represent the result of second-order difference of lnL, in which case lnGDP, d2lnL, lnK and lnT are stationary. Note, however, that second-order differentials are difficult to explain, and let's assume that d2lnL is still a variable related to labor input. Because the transformed sequences are all stationary sequences, there is no problem of several order stationarity, so it is not necessary to carry out cointegration test here, but to judge the model directly.

Next, we do a model setting test. First of all, we need to use the F test (the original hypothesis is the mixed model is valid, the alternative hypothesis is the fixed effect effective) to determine whether the mixed model or the fixed effect model should be selected, and then the Hausman test (the original hypothesis is random effect is valid, the alternative hypothesis is fixed effect is valid) to determine whether the random effect model or the fixed effect model should be established. It is important to note that if we want to estimate the mixed model or fixed effect in Eviews, we need to estimate the parameter of the fixed effect first. The specific operation procedure is to click "view" in the panel data interface and select "Fixed/Random Effects Testing"- "Redundant Fixed Effect-likelihood ratio":

Table 4 F statistic test

| Effects Test | Statistic | d.f. | Prob. |
|--------------------------|------------|----------|--------|
| Cross-section F | 84.451216 | (15,109) | 0.0000 |
| Cross-section Chi-square | 324.533721 | 15 | 0.0000 |

$P = 0.0000$ means that the original hypothesis should be rejected and the mixed model should be abandoned to choose the fixed effect model. Then there is the Hausman test, click "view" in the panel data interface, and select "Fixed/Random Effects Testing"- "Correlated Random Effects-Hausman Test":

Table 5 Hausman test

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|----------------------|-------------------|--------------|--------|
| Cross-section random | 34.875283 | 3 | 0.0000 |

$P = 0.0000$ means rejecting the original hypothesis, that is, we should choose a fixed effect model to estimate the panel data.

3.3 Parameter Regression

Then, we can get the parameter regression of the panel data in the table 6.

As can be seen from Table 6, the total coefficient of total tourism income and social fixed assets investment is positive and significant at 1% confidence level, indicating that tourism income and fixed assets investment have obvious promoting effect on GDP. Moreover, the adjusted R-squared value of the fixed effect model is up to 97.89%, the interpretation of the fixed effect model is better than that of the mixed effect model and the random effect model, and the error is relatively small, which further confirms the test results in 3.2.2. The fixed effect model is more effective to estimate the panel data in this paper. So we can obtain the regression equation based on the Fixed effect

model:

$$\ln GDP = 2.397 + 0.252 \ln K + 0.008 d2 \ln L + 0.266 \ln T \quad (6)$$

That's to say, under the premise of constant labor and capital, each additional unit of total tourism income will increase the total economic production by 0.266 points.

Table 6 Model parameter regression results

| | Mixed effect model | Fixed effect model | Random effect model |
|--------------------|--------------------------|--------------------------|--------------------------|
| lnT | 0.549054*** (10.5806) | 0.266097*** (9.4619) | 0.273718*** (10.0759) |
| lnK | 0.330222*** (6.2450) | 0.252250*** (6.5875) | 0.265661*** (7.3123) |
| d2lnL | 0.200279 (0.8508) | 0.007587 (0.1065) | 0.018015 (0.2531) |
| _cons | 1.076687*** (6.2730) | 2.396887*** (23.6307) | 2.313863*** (23.2439) |
| R-squared | 0.771664 | 0.981909 | 0.822848 |
| Adjusted R-squared | 0.766140 | 0.978922 | 0.818562 |
| S.E. of regression | 0.119955 | 0.036013 | 0.040377 |
| F-statistic | 139.6865 | 328.6774 | 191.9874 |

*** indicates significant at 1% confidence level, The number in parentheses is t-value

4. Conclusion

In this paper, in order to study the influence of tourism on economic growth, Cobb-Douglas production function is selected, and tourism variables are introduced into the accounting equation of production function. The logarithm is taken to obtain the linear model $\ln Y = \ln A + \alpha \ln K + \beta \ln L + \gamma \ln T + \mu$ as the basis of the study. Then, based on the availability of each index data, this paper selects the GDP output of Beijing, Shanxi Province, Inner Mongolia Autonomous region, Liaoning Province, Jilin Province, Shanghai, Jiangsu Province, Zhejiang Province, Anhui Province, Fujian Province, Jiangxi Province, Shandong Province, Henan Province, Hunan Province, Guangdong Province and Guangxi Zhuang Autonomous region from 2008 to 2017 as the explained variables. The total fixed assets investment of the whole society, the annual employment of labor force and the total income of tourism are used as explanatory variables to explore the impact of tourism on the economic growth of provinces, cities and autonomous regions. According to the panel data processing method and modeling process introduced in this paper, the LLC, IPS, ADF, PP stationarity test of the collected panel data is carried out, but because of the characteristics of the data in this paper, no cointegration test is carried out. Finally, the regression model of panel data is determined, the fixed effect model is selected, and the conclusion is drawn: on the premise that labor and capital remain unchanged, Each additional unit of total tourism revenue will boost total economic production by 0.266 points. Generally speaking, for all provinces and cities in China, the role of tourism in promoting economic growth is positive.

References

- [1] Luis A. Arteaga-Molina, Juan M. Rodríguez-Poo. Empirical likelihood based inference for a categorical varying-coefficient panel data model with fixed effects[J]. Journal of Multivariate Analysis, 2019, 173.
- [2] Jingyan Fu, Yanyun Geng. Public participation, regulatory compliance and green development in China based on provincial panel data[J]. Journal of Cleaner Production, 2019, 230.
- [3] Danyun Shen, Mengyao Xia, Qiyu Zhang, Ehsan Elahi, Yi Zhou, Huiming Zhang. The impact of

public appeals on the performance of environmental governance in China: A perspective of provincial panel data[J]. *Journal of Cleaner Production*,2019,231.

[4] Yongpei Wang,Weilong Yan,Supak Komonpipat. How does the capacity utilization of thermal power generation affect pollutant emissions? Evidence from the panel data of China's provinces[J]. *Energy Policy*, 2019,132.

[5] Does tourism effectively stimulate Malaysia's economic growth?[J] . Chor Foon Tang, Eu Chye Tan. *Tourism Management* . 2015

[6] The economic impacts of tourism in Botswana, Namibia and South Africa: Is poverty subsiding?[J] . Edwin Muchapondwa, Jesper Stage. *Nat Resour Forum* . 2013 (2)

[7] Which type of tourism matters to the regional economic growth? The cases of Spain and Italy[J] . Isabel Cortés-Jiménez. *Int. J. Tourism Res.* . 2008 (2)

[8] Tourism as a long-run economic growth factor: the Spanish case[J] . Jacint Balaguer, Manuel Cantavella-Jorda. *Applied Economics* . 2002 (7)