

Research On The Spatial Differentiation Pattern And Influencing Factors Of Per Capita Tourism Income In Western China

——Take Sichuan Province As An Example

Li Yuan^{1,2}, Li Qiaoling^{3,*}

¹(School of Economics and Management, Zhoukou Normal University, Zhoukou 466000, Henan, China)

²(Graduate School of Business, SEGI University, Petaling Jaya 47810, Selangor, Malaysia)

³(Graduate School of Business, City University Malaysia, Petaling Jaya 46100, Selangor, Malaysia)

Abstract:

Take Sichuan Province as an example, which is rich in tourism resources, by using the data of 21 cities (prefectures), and research on the distribution characteristics and influencing factors of per capita tourism income in Western China. The results show that: (1) The per capita tourism income in Sichuan has formed 5 different types, as follows: the low-income type (<2990 yuan/person), the lower-income type (2990-8,000 yuan/person), the middle-income type (8,000-13780 yuan/person), the higher-income type (13780-18600 yuan/person), and the high-income type (>18,600 yuan/person). Among them, the high-income type has formed a patchy pattern of staggered distribution; The descending order of tourism elements that affect per capita tourism income is: the permanent resident population at the end of the year> the number of students in colleges and universities> the number of private cars> park areas> the number of 3A-level scenic spots> the sewage treatment rate> the greenery coverage of urban areas>the number of 2A-level scenic spots> the urbanization rate>the forest coverage rate> the number of 5A-level scenic spots;

There is a significant positive correlation between per capita tourism income and the number of 2A-level scenic spots, the number of 5A-level scenic spots, the forest coverage rate, the greenery coverage of urban areas, the sewage treatment rate, the urbanization rate, the number of private cars, the number of students in colleges and Secondary technical schools, and there is a significant negative correlation with the number of 3A-level scenic spots, the area of parks, and the number of permanent residents at the end of the year.

Background: The tourism industry is one of the strategic pillar industries in our country and plays an important role in building an ecological civilization society and a beautiful China, contributing significantly to poverty reduction and economic growth in various regions^{1,2}. The western region of China possesses abundant tourism resources but also faces the challenge of fragile ecological resources. Over the past decade, the growth rate of inbound tourism revenue in the western region has surpassed that of the traditional destination in South China, making it the region with the highest growth rate of inbound tourism revenue in the country³. With the gradual deepening of the "Belt and Road" initiative and the increasing global influence and notable changes in the global tourism economy, the regional structure and pattern of inbound tourism in China will be reshaped⁴. Compared to the eastern and central regions, the proportion of tourism revenue to GDP is higher in the western region, and the synchronicity between tourism and economic development is more pronounced, indicating a more significant correlation between the two. The development of tourism plays a vital role in promoting sociological economic development in the western region⁵. Per capita tourism income is an important indicator for evaluating the level of tourism development in a region. In recent years, although many domestic and foreign scholars have conducted research on the relationship between per capita tourism income and ecological environmental factors^{6,7,8,9,10,11,12,13,14}, there is still a lack of systematic studies on the relationship between per capita tourism income and quality of scenic spots, regional environmental factors, urban facilities, public services, and tourist source guarantee factors, as reported in the existing literature. Therefore, this paper aims to take Sichuan Province, a representative region of tourism in western China, as a case study, to investigate the spatial differentiation pattern of per capita tourism income in the western region, and to reveal the impact of ecological environmental factors (such as quality of scenic spots, regional environment, urban facilities, public services, and tourist source guarantee) on per capita tourism income in the western region. The goal is to improve the understanding of the spatial differentiation pattern of per capita tourism income and its relationship with environmental factors, providing technical support for guiding the development of the tourism industry in the western region of our country.

Materials and Methods: The study area covers 21 cities (prefectures) in Sichuan Province. The data used in this analysis, including scenic quality factors, regional environmental factors, urban facilities factors, public

service factors, and customer source factors, mainly come from the "Sichuan Statistical Yearbook 2019." Additionally, some data were obtained from surveys conducted by the tourism bureaus of the 21 cities (prefectures). Additionally, some data were obtained from surveys conducted by the tourism bureaus of the 21 cities (prefectures).

(1) *Production of Spatial Distribution Maps:* ArcGIS 10.2 software was used to create a spatial map of per capita tourism income in Sichuan Province. The specific steps are as follows: First, associate the map data with the Excel data, and import the per capita tourism income data of each city in Sichuan Province into a GIS format shapefile. Then, start editing and define the display scheme based on the attribute information of the data. Open the layer properties, use the gradient color ramp rendering method to divide the features into several groups, and determine the interval size and spacing. Enter the Layout View interface, set the scale and page size, and add map elements (title, north arrow, scale bar, legend, frame, etc.). Finally, generate the spatial distribution map.

(2) *Establishment of Mathematical Models:* The DPS software developed by Tang Qiyi et al. was used for statistical analysis of the measured data. The relationship equation between per capita tourism income and scenic quality factors, regional environmental factors, urban facilities factors, public service factors, and customer source factors was established using stepwise regression analysis. Factor regression analysis was then used to comprehensively analyze the influence of different factors on per capita tourism income in Sichuan Province.

Results: The per capita tourism income forms five different types in geographical space, and presents a patchy staggered distribution pattern. Among the per capita tourism income and tourism factors, the number of 2A level scenic spots and 5A level scenic spots in scenic spot quality factors has a significant positive correlation with per capita tourism income, while the number of 3A level scenic spots has a significant negative correlation with per capita tourism income. Among the regional environmental factors, the forest coverage rate and green coverage rate of built-up areas are positively correlated with per capita tourism income, while the park area is negatively correlated with per capita tourism income. Among the factors of urban facilities, sewage treatment rate and urbanization rate have significant positive correlation with per capita tourism income. Among the factors of tourist source security, the number of students in colleges and universities and the number of permanent residents at the end of the year have a significant positive correlation with per capita tourism income.

Conclusion: Many factors, such as scenic spot quality, regional environment, urban facilities and tourist source security, have an impact on per capita tourism income, among which scenic spot quality and regional environment factors have a more significant impact on per capita tourism income.

Key Word: Western region; per capita tourism income; distribution characteristics; influencing factors

Date of Submission: 06-08-2023

Date of Acceptance: 16-08-2023

I. Introduction

The tourism industry is one of the strategic pillar industries in our country and plays an important role in building an ecological civilization society and a beautiful China, contributing significantly to poverty reduction and economic growth in various regions^{1,2}. The western region of China possesses abundant tourism resources but also faces the challenge of fragile ecological resources. Over the past decade, the growth rate of inbound tourism revenue in the western region has surpassed that of the traditional destination in South China, making it the region with the highest growth rate of inbound tourism revenue in the country³. With the gradual deepening of the "Belt and Road" initiative and the increasing global influence and notable changes in the global tourism economy, the regional structure and pattern of inbound tourism in China will be reshaped⁴. Compared to the eastern and central regions, the proportion of tourism revenue to GDP is higher in the western region, and the synchronicity between tourism and economic development is more pronounced, indicating a more significant correlation between the two. The development of tourism plays a vital role in promoting sociological economic development in the western region⁵. Per capita tourism income is an important indicator for evaluating the level of tourism development in a region. In recent years, although many domestic and foreign scholars have conducted research on the relationship between per capita tourism income and ecological environmental factors^{6,7,8,9,10,11,12,13,14}, there is still a lack of systematic studies on the relationship between per capita tourism income and quality of scenic spots, regional environmental factors, urban facilities, public services, and tourist source guarantee factors, as reported in the existing literature. Therefore, this paper aims to take Sichuan Province, a representative region of tourism in western China, as a case study, to investigate the spatial differentiation pattern of per capita tourism income in the western region, and to reveal the impact of ecological environmental factors (such as quality of scenic spots, regional environment, urban facilities, public services, and tourist source guarantee) on per capita tourism income in the western region. The goal is to improve the

understanding of the spatial differentiation pattern of per capita tourism income and its relationship with environmental factors, providing technical support for guiding the development of the tourism industry in the western region of our country.

II. Material And Methods

Area Overview

The study area covers 21 cities (prefectures) in Sichuan Province, including Chengdu, Zigong, Panzhihua, Luzhou, Deyang, Mianyang, Guangyuan, Suining, Neijiang, Leshan, Nanchong, Meishan, Yibin, Guangan, Dazhou, Ya'an, Bazhong, Ziyang, Aba Tibetan and Qiang Autonomous Prefecture, Ganzi Tibetan Autonomous Prefecture, and Liangshan Yi Autonomous Prefecture.

Data Sources and Survey

The data used in this analysis, including scenic quality factors, regional environmental factors, urban facilities factors, public service factors, and customer source factors, mainly come from the "Sichuan Statistical Yearbook 2019." Additionally, some data were obtained from surveys conducted by the tourism bureaus of the 21 cities (prefectures), such as Chengdu, Zigong, Panzhihua, Luzhou, Deyang, Mianyang, Guangyuan, Suining, Neijiang, Leshan, Nanchong, Meishan, Yibin, Guangan, Dazhou, Ya'an, Bazhong, Ziyang, Aba Tibetan and Qiang Autonomous Prefecture, Ganzi Tibetan Autonomous Prefecture, and Liangshan Yi Autonomous Prefecture. For missing data, on-site visits and investigations were conducted by our research team.

Data Analysis and Processing

(1) Production of Spatial Distribution Maps: ArcGIS 10.2 software was used to create a spatial map of per capita tourism income in Sichuan Province. The specific steps are as follows: First, associate the map data with the Excel data, and import the per capita tourism income data of each city in Sichuan Province into a GIS format shapefile. Then, start editing and define the display scheme based on the attribute information of the data. Open the layer properties, use the gradient color ramp rendering method to divide the features into several groups, and determine the interval size and spacing. Enter the Layout View interface, set the scale and page size, and add map elements (title, north arrow, scale bar, legend, frame, etc.). Finally, generate the spatial distribution map.

(2) Establishment of Mathematical Models: The DPS software developed by Tang Qiyi et al. was used for statistical analysis of the measured data. The relationship equation between per capita tourism income and scenic quality factors, regional environmental factors, urban facilities factors, public service factors, and customer source factors was established using stepwise regression analysis. Factor regression analysis was then used to comprehensively analyze the influence of different factors on per capita tourism income in Sichuan Province.

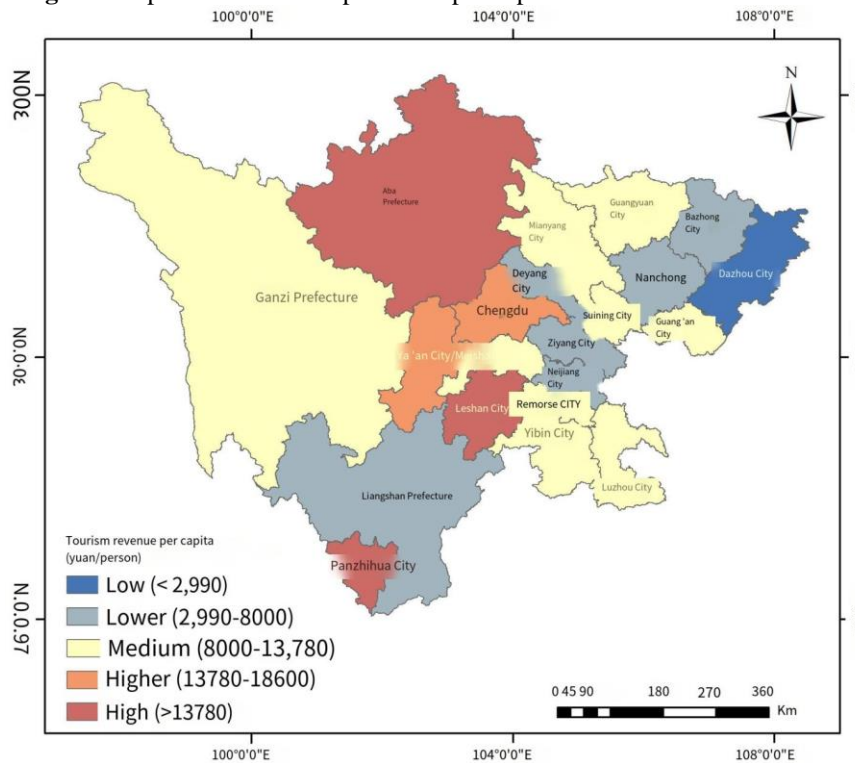
III. Result

Spatial Distribution Characteristics of Per Capita Tourism Income

According to the analysis, the per capita tourism income in 21 different regions and cities in Sichuan Province ranged from 2991.26 yuan to 30687.70 yuan, with an average of 12031.65 ± 6867.8515 yuan and a coefficient of variation of 54.31%. At the same time, the per capita tourism income can be divided into five different types: low-income type (<2990 yuan/person), lower-income type (2990-8000 yuan/person), medium-income type (8000-13780 yuan/person), higher-income type (13780-18600 yuan/person), and high-income type (>18600 yuan/person). These types have formed a patchy and overlapping distribution pattern in the geographical space. The details are as follows:

(1) High-income Type: From Figure 1, it can be seen that the high-income type of per capita tourism income in Sichuan Province can be divided into three regions geographically. Among them, one is the high-income area of northern Sichuan with Aba Tibetan Autonomous Prefecture as the center. The average per capita tourism income here is 24925.84 yuan, which is 2.07 times the average level of per capita tourism income in Sichuan Province (12031.65 yuan). The second is the high-income area of central Sichuan with Leshan City as the center. The average per capita tourism income here is 23538.41 yuan, which is 1.96 times the average level of per capita tourism income in Sichuan Province. The third region is the high-income area of southern Sichuan with Panzhihua City as the center. The average per capita tourism income here is 30687.70 yuan, which is 2.55 times the average level of per capita tourism income in Sichuan Province.

Figure 1: Spatial distribution pattern of per capita tourism income in Sichuan.



(2) Higher-income Type: From Figure 1, it can be seen that the higher-income type of per capita tourism income in Sichuan Province includes only one region geographically, which is the higher-income area of central Sichuan including Chengdu City and Ya'an City. The average per capita tourism income here is 15318.95 yuan. Among them, the per capita tourism income in Chengdu City is 18606.24 yuan, which is 1.54 times the average level of per capita tourism income in Sichuan Province. The per capita tourism income in Ya'an City is 16564.93 yuan, which is 1.37 times the average level of per capita tourism income in Sichuan Province.

(3) Medium-income Type : From Figure 1, it can be observed that the per capita tourism income of the medium-income type forms three regions in geographical space. The first region is the northeast region of Sichuan Province, centered around Mianyang, Guangyuan, Suining, and Guangan. The average per capita tourism income here is 11,483.50 yuan. Specifically, the per capita tourism income in Mianyang is 10,977.97 yuan, accounting for 91.24% of the average level of per capita tourism income in Sichuan province (12,031.65 yuan). The per capita tourism income in Guangyuan is 12,545.93 yuan, which is 1.04 times the average level of per capita tourism income in Sichuan province (12,031.65 yuan). The per capita tourism income in Suining is 12,029.98 yuan, which is almost the same as the average level of per capita tourism income in Sichuan province (12,031.65 yuan). The per capita tourism income in Guangan is 10,826.9053 yuan, accounting for 89.99% of the average level of per capita tourism income in Sichuan province (12,031.65 yuan). The second region is the southeast region of Sichuan province, centered around Meishan, Zigong, Yibin, and Luzhou, including other cities. The average per capita tourism income here is 11,351.46 yuan. Specifically, the per capita tourism income in Meishan is 11,953.75 yuan, accounting for 99.35% of the average level of per capita tourism income in Sichuan province (12,031.65 yuan). The per capita tourism income in Zigong is 11,674.66 yuan, accounting for 97.04% of the average level of per capita tourism income in Sichuan province (12,031.65 yuan). The per capita tourism income in Yibin is 11,823.97 yuan, accounting for 98.27% of the average level of per capita tourism income in Sichuan province (12,031.65 yuan). The per capita tourism income in Luzhou is 11,209.70 yuan, accounting for 93.17% of the average level of per capita tourism income in Sichuan province (12,031.65 yuan). The third region is the western region of Sichuan province with Ganzi Tibetan Autonomous Prefecture as the center. The per capita tourism income here is 13,787.63 yuan, which is 1.54 times the average level of per capita tourism income in Sichuan province (12,031.65 yuan).

(4) Lower Middle-Income Group : From Figure 1, it can be observed that the lower middle-income group has formed three regions in the geographical space. The first lower middle-income area is in eastern Sichuan, centered around Nanchong and Bazhong. The per capita tourism income here is 6,849.01 yuan, which is 56.92% of the average per capita tourism income in Sichuan province (12,031.65 yuan). Specifically, the per

capita tourism income in Nanchong is 7,122.67 yuan, accounting for 59.20% of the average per capita tourism income in Sichuan province (12,031.65 yuan); the per capita tourism income in Bazhong is 6,318.48 yuan, which is 52.15% of the average per capita tourism income in Sichuan province (12,031.65 yuan). The second lower middle-income area is in southeastern Sichuan, centered around Deyang, Ziyang, and Neijiang. The per capita tourism income here is 6,849.01 yuan, which is 1.54 times the average per capita tourism income in Sichuan province (12,031.65 yuan). Specifically, the per capita tourism income in Deyang is 8,042.32 yuan, accounting for 66.84% of the average per capita tourism income in Sichuan province (12,031.65 yuan); the per capita tourism income in Ziyang is 6,457.01 yuan, which is 53.67% of the average per capita tourism income in Sichuan province (12,031.65 yuan); the per capita tourism income in Neijiang is 7,120.84 yuan, which is 59.18% of the average per capita tourism income in Sichuan province (12,031.65 yuan). The third lower middle-income area is in southern Sichuan, centered around Liangshan Prefecture. The per capita tourism income here is 7,375.38 yuan, which is 61.30% of the average per capita tourism income in Sichuan province (12,031.65 yuan).

(5) Low-Income Group : From Figure 1, it can be seen that there is only one low-income area for per capita tourism in Sichuan province, namely Dazhou City. The per capita tourism income here is 2,991.26 yuan, accounting for only 24.86% of the average per capita tourism income in Sichuan province (12,031.65 yuan).

Relationship between Per Capita Tourism Income and Tourism Factors

Relationship between Per Capita Tourism Income and Scenic Area Quality Factors

Based on the stepwise regression analysis, the relationship equation between per capita tourism income (Y) and quality factors of 1A-grade scenic areas (X1), 2A-grade scenic areas (X2), 3A-grade scenic areas (X3), 4A-grade scenic areas (X4), and 5A-grade scenic areas (X5) can be established as follows:

$$Y=6281.3404+978.0674X2-712.6627X3+327.8817X4+3773.7914X5$$
$$(N=21 \quad R=0.7033^* \quad R2=0.5990^{**} \quad R3=-0.4922^* \quad R4=0.3763 \quad R5=0.5425^*) (1)$$

From equation (1), it can be observed that the main scenic area quality factors influencing per capita tourism income (Y) are the number of 2A-grade scenic areas (X2), the number of 3A-grade scenic areas (X3), the number of 4A-grade scenic areas (X4), and the number of 5A-grade scenic areas (X5), while the impact of the number of 1A-grade scenic areas (X1) is relatively small. Furthermore, from equation (2), it can be seen that the partial correlation coefficients with the number of 2A-grade scenic areas (X2) and the number of 5A-grade scenic areas (X5) reach a significant or highly significant positive correlation level, while the partial correlation coefficient with the number of 3A-grade scenic areas (X3) reaches a significant negative correlation level. However, the partial correlation relationship with the number of 4A-grade scenic areas does not reach statistical significance ($P < 0.05$). The regression equation has passed the significance test at the $\alpha = 0.05$ level based on the standard error test. This indicates that per capita tourism income significantly increases with an increase in the number of 2A-grade scenic areas (X2) and 5A-grade scenic areas (X5), as well as a decrease in the number of 3A-grade scenic areas (X3). It also demonstrates that the impact of scenic area quality factors on per capita tourism income is statistically significant ($P < 0.05$).

Relationship between per capita tourist income and regional environmental factors

Using the stepwise regression analysis method, a relationship equation was established between per capita tourist income (Y) and regional environmental factors such as the number of good air quality days throughout the year (X1), forest coverage rate (X2), total water resources (X3), green coverage area (X4), green area (X5), park green area (X6), number of parks (X7), park area (X8), and built-up area greening coverage rate (X9):

$$Y=-56976.1101+26823.5564X2+0.7163X5+150.7430X7-9.9401X8+1422.2291X9$$
$$(N=21 \quad R=0.8090^{**} \quad R2=0.6465^{**} \quad R5=0.3964 \quad R7=0.3122 \quad R8=-0.5464^* \quad R9=0.6139^{**}) (2)$$

From equation (2), it can be observed that the main regional environmental factors influencing per capita tourist income (Y) are forest coverage rate (X2), green area (X5), park green area (X6), number of parks (X7), park area (X8), and built-up area greening coverage rate (X9), while the influence of the number of good air quality days throughout the year (X1), total water resources (X3), and green coverage area (X4) is relatively small. Additionally, equation (2) indicates that the partial correlation coefficients between per capita tourist income (Y) and forest coverage rate (X2), as well as built-up area greening coverage rate (X9), reach a significantly positive correlation level, while the partial correlation coefficient with park area (X8) reaches a significantly negative correlation level. However, the partial correlation relationships with the green area (X5) and number of parks (X7) do not reach statistical significance ($P < 0.05$). According to the standard error test, this regression equation passes the significance test at $\alpha=0.01$ level, indicating that per capita tourist income significantly increases with an increase in forest coverage rate (X2), built-up area greening coverage rate (X9), and a decrease in park area (X8). It also demonstrates that the impact of regional environmental factors on per capita tourist income reaches a highly significant level ($P < 0.01$).

The Relationship between Per Capita Tourism Income and Urban Facility Factors

Based on stepwise regression analysis, the relationship equation between per capita tourism income (Y) and urban facility factors such as per capita urban road area (X1), sewage treatment rate (X2), urbanization rate (X3), and solid waste treatment rate (X4) is as follows:

$$Y = -91684.2441 + 889.51167X_2 + 417.4917X_3 \\ (N=21 \quad R=0.5969^* \quad R_2=0.4642^* \quad R_3=0.5509^*) \quad (3)$$

From equation (3), it can be seen that the main urban facility factors affecting per capita tourism income (Y) are the sewage treatment rate (X2) and urbanization rate (X3), while the impact of per capita urban road area (X1) and solid waste treatment rate (X4) is small. Furthermore, from equation (3), it can be observed that the partial correlation coefficients with the sewage treatment rate (X2) and urbanization rate (X3) reach a significant positive correlation level. According to the standard error test, this regression equation passed the significance test at the 0.05 level. This indicates that per capita tourism income significantly increases with the increase of the sewage treatment rate (X2) and urbanization rate (X3). It also suggests that the impact of urban facility factors on per capita tourism income reaches a significant level ($P < 0.05$).

The Relationship between Per Capita Tourism Income and Public Service Factors

Based on stepwise regression analysis, the relationship equation between per capita tourism income (Y) and public service factors such as total road mileage (X1), grade road mileage (X2), expressway mileage (X3), private car quantity (X4), and road passenger turnover (X5) is as follows:

$$Y = 22223.5905 - 0.2216X_2 - 17.6495X_3 + 83.3729X_4 - 0.0191X_5 \\ (N=21 \quad R=0.6067 \quad R_2=-0.2510 \quad R_3=-0.3380 \quad R_4=0.5751^* \quad R_5=-0.2947) \quad (4)$$

From equation (4), it can be seen that the main public service factors affecting per capita tourism income (Y) are grade road mileage (X2), expressway mileage (X3), private car quantity (X4), and road passenger turnover (X5), while the impact of total road mileage (X1) is small. Additionally, from the equation, it can be observed that the partial correlation coefficient with the private car quantity (X4) shows a significant positive correlation. However, the partial correlation coefficients between per capita tourism income (Y) and grade road mileage (X2), expressway mileage (X3), and road passenger turnover (X5) exhibit a negative correlation, but none of them reach significance ($P < 0.05$). According to the standard error test, this regression equation does not pass the significance test at the 0.05 level. This indicates that per capita tourism income increases with an increase in private car quantity (X4) and a decrease in grade road mileage (X2), expressway mileage (X3), and road passenger turnover (X5). It also suggests that the impact of public service factors on per capita tourism income does not reach a significant level ($P < 0.05$).

The Relationship between Per Capita Tourism Income and Factors of Source Market Guarantee

Based on stepwise regression analysis, the relationship equation between per capita tourism income (Y) and factors of source market guarantee such as the number of tertiary institutions (X1), the number of students in tertiary institutions (X2), the number of primary and secondary schools (X3), the number of students in primary and secondary schools (X4), the population at the end of the year (X5), and the per capita disposable income of urban and rural residents (X6) is as follows:

$$Y = 19876.6487 + 0.0606X_2 + 0.1228X_4 - 50.1055X_5 + 0.2054X_6 \\ (N=21 \quad R=0.7346^{**} \quad R_2=0.6435^{**} \quad R_4=0.2301 \quad R_5=-0.5825^* \quad R_6=0.0705) \quad (5)$$

From equation (5), it can be seen that the main factors of source market guarantee affecting per capita tourism income (Y) are the number of students in tertiary institutions (X2), the number of students in primary and secondary schools (X4), the population at the end of the year (X5), and the per capita disposable income of urban and rural residents (X6), while the impact of the number of tertiary institutions (X1) and the number of primary and secondary schools (X3) is minimal. Furthermore, from equation (5), it can also be observed that there is a significant positive correlation with the number of students in tertiary institutions (X2) and a significant negative correlation with the population at the end of the year (X5), but the partial correlation coefficients with the number of students in primary and secondary schools (X4) and the per capita disposable income of urban and rural residents (X6) do not reach significance ($P < 0.05$). According to the standard error test, this regression equation passes the significance test at the 0.05 level. This indicates that per capita tourism income significantly increases with an increase in the number of students in tertiary institutions (X2) and a decrease in the population at the end of the year (X5). It also suggests that the factors of source market guarantee have a significant impact on per capita tourism income ($P < 0.01$).

The relationship between per capita tourism income and various factors

Based on the above analysis, it can be seen that per capita tourism income has a significant or highly significant positive correlation with the number of 2A-grade scenic spots, the number of 5A-grade scenic spots,

forest coverage rate, built-up area green coverage rate, sewage treatment rate, urbanization rate, private car quantity, and the number of students in higher education institutions. It has a significant negative correlation with the number of 3A-grade scenic spots, park areas, and end-of-year resident population. However, the extent to which these factors affect per capita tourism income is still unclear. Therefore, we used factor analysis to analyze the 11 variables that significantly affect per capita tourism income. From Table 1, it can be observed that the order of influence of these 11 variables on per capita tourism income, from highest to lowest, is: end-of-year resident population > number of students in higher education institutions > private car quantity > park area > number of 3A-grade scenic spots > sewage treatment rate > built-up area green coverage rate > number of 2A-grade scenic spots > urbanization rate > forest coverage rate > number of 5A-grade scenic spots.

IV. Conclusion and Discussion

The results of this study indicate that the per capita tourism income in 21 different cities in Sichuan Province varies from 2,991.26 to 30,687.70 yuan, with an average of $12,031.65 \pm 6,867.8515$ yuan and a coefficient of variation of 54.31%. At the same time, the per capita tourism income forms five different types in terms of geographical space: low-income type (<2,990 yuan/person), relatively low-income type (2,990-8,000 yuan/person), medium-income type (8,000-13,780 yuan/person), relatively high-income type (13,780-18,600 yuan/person), and high-income type (>18,600 yuan/person). Among them, the high-income type is mainly concentrated in the northern region centered around Aba Tibetan Autonomous Prefecture, the central region centered around Leshan City, and the southern region centered around Panzhihua City, forming a patchy and overlapping distribution pattern. This indicates that the level of per capita tourism income in a region is directly related to the local ecological environment quality, the richness of tourism resources, and the level of economic development. It also demonstrates that in order to improve the level of tourism income in a region, it is crucial to actively develop local advantages in tourism resources, protect the local ecological environment, and carry out high-quality ecological civilization construction. Only by doing so can more tourists be attracted to visit, thereby driving the development of the local tourism industry.

The research findings also show that the tourism factors that affect per capita tourism income in descending order are: year-end resident population, number of college students, number of private cars, park area, number of 3A-rated scenic spots, sewage treatment rate, urban greening coverage in built-up areas, number of 2A-rated scenic spots, urbanization rate, forest coverage rate, and number of 5A-rated scenic spots. This indicates that the most influential factors for per capita tourism income are the source of tourists, followed by public service factors, scenic spot quality factors, urban facility factors, and regional environmental factors, which are the result of their combined effect. Specifically, the source of tourists is mainly determined by the year-end resident population and the number of college students, while public service factors are mainly influenced by the number of private cars. The quality of scenic spots is mainly determined by the number of 3A-rated, 2A-rated, and 5A-rated scenic spots. Regional environmental factors include park area, urban greening coverage in built-up areas, and forest coverage rate. Urban facility factors mainly include urbanization rate and sewage treatment rate. Dyslipidemia in patients with diabetes plays an important role in development of atherogenesis. The standardized of treatment for dyslipidemia have been statins. For the treatment of dyslipidemia the most commonly used statins are atorvastatin and rosuvastatin. The four major statin beneficiary groups have already been defined by NCEP 2013 report.

Table 1 Load matrix of factors affecting per capita tourism income

Influencing Factors	Factor 1	Factor 2	Factor 3	Factor4	Communalit y	Specific variance
the number of 2A-level scenic spots	0.2943	0.1516	0.9080	-0.0401	0.9356	0.0644
the number of 3A-level scenic spots	0.8430	0.0156	0.2728	0.0134	0.7855	0.2145
the number of 5A-level scenic spots	0.2086	0.5984	-0.2970	0.6106	0.8627	0.1373
the forest coverage rate	-0.1971	0.0330	0.0794	0.9232	0.8986	0.1014
the area of parks	0.8790	0.1253	0.3357	-0.0779	0.9071	0.0929
the greenery coverage of urban areas	0.1373	0.8111	0.1527	0.1560	0.7244	0.2756
the sewage treatment rate	-0.1396	0.8392	-0.0283	-0.0612	0.7283	0.2717
the urbanization rate	0.5574	-0.1708	0.6887	0.0855	0.8214	0.1786
the number of private cars	0.9358	0.0559	0.1345	-0.0525	0.8998	0.1002
the number of students in colleges and Secondary	0.9542	0.0298	0.1425	0.0013	0.9317	0.0683

technical schools						
the number of permanent residents at the end of the year	0.9685	-0.0752	0.1032	-0.1218	0.9691	0.0309
variance contribution	4.7256	1.7992	1.6535	1.2861		
Cumulative contribution rate	42.9601	59.3168	74.3482	86.0398		

This indicates that modern tourists tend to prefer traveling to areas or cities with a relatively lower year-end resident population, a higher number of 2A-rated and 5A-rated scenic spots, and higher forest coverage rate, urban greening coverage in built-up areas, and sewage treatment rate. Additionally, it suggests that as the urbanization rate increases and the local park area decreases, people are more willing to travel outside their local area. The main source of tourists is college students, and the preferred mode of transportation is private cars. Visitors are less inclined to visit overcrowded scenic spots (3A-rated scenic spots).

The research findings of this article indicate that per capita tourism income is significantly or extremely positively correlated with the number of 2A-level tourist attractions, the number of 5A-level tourist attractions, forest coverage, green coverage in built-up areas, sewage treatment rate, urbanization rate, private car ownership, and the number of students in colleges and universities. There is also a significant negative correlation between per capita tourism income and the number of 3A-level tourist attractions, park areas, and year-end resident population. Additionally, per capita tourism income is positively correlated with per capita disposable income of urban and rural residents. These research results are consistent with previous studies, including those that found a positive correlation between the disposable income of urban and rural residents and tourism income, a positive correlation between the ecological environment in rural tourism and tourism income, and the positive correlation between the ecological environment and tourism income. However, there are some inconsistent findings from other studies regarding the impact of factors such as the number of parks and total road length on tourism income. The reasons for these discrepancies require further research.

References

- [1]. Zhao Lei, Zhang Chen. Threshold Effect Of Tourism Poverty Alleviation And Its Empirical Test: A Study Based On Provincial Panel Data In Western China. *Finance And Trade Economics*, 2018, 39(5): 130-145.
- [2]. Hong Zheng, Wang Lin, Zhang Cheng. Factors Influencing Regional Tourism Ecological Efficiency Under The Background Of Green Development: A Case Study Of Western China. *Acta Ecologica Sinica*, 2021, 41(9): 3512-3524.
- [3]. Wang Zhaojie, Jiang Naiyuan. Analysis Of The Upgrading Of Tourism Consumption Market And Its Expansion Of Domestic Demand Effect In Western China. *Research On Business Economics*, 2021, 9(6): 163-167.
- [4]. Ba Duoxun, Wen Qian. Research On The Trend And Development Of Inbound Tourism In Western China Under The Background Of "Belt And Road". *World Economic Research*, 2017 (08): 6-9.
- [5]. Ma Lijun, Zhang Jiafeng. Spatial-Temporal Distribution Differences Of Tourism Demand In 5A-Grade Scenic Areas For Typical Urban Residents. *Tourism Economics*, 2020 (07): 48-56.
- [6]. Wang Ning, Du Changchun, Yang Linxi. Analysis Of Factors Influencing Tourism Revenue In China: Based On Provincial Panel Data Analysis. *Research On Business Economics*, 2020 (08): 177-180.
- [7]. Yang Yanxiao, Chen Yaning, Kang Suoqian, Li Rui, Yu Xinle. Analysis Of Tourism Revenue Sources And Influencing Factors Based On Multiple Linear Regression Model. *Rural Economy And Science & Technology*, 2020, 31(07): 118-120.
- [8]. Gu Jiamin, Yao Huifang. Analysis Of Tourism Revenue Forecast And Its Influencing Factors In Jiangsu Province. *China Forestry Economics*, 2020 (02): 101-103+133.
- [9]. Li Guobing. Analysis Of Factors Affecting Urban Tourism Revenue In The Pearl River Delta: Based On The Definition Of Tourism Revenue. *Regional Research And Development*, 2019, 38(05): 91-96.
- [10]. Li Jiao. An Empirical Analysis Of The Influencing Factors Of Domestic Tourism Revenue In China. *Journal Of Chongqing Technology And Business University (Natural Science Edition)*, 2019, 36(05): 105-114.
- [11]. Zheng Cailiang, Chen Manlin, Chen Guisong, Lin Xiaoying. A Study On The Influencing Factors Of Forest Park Tourism Revenue Based On Panel Data Of Provinces From 2010 To 2017. *China Forestry Economics*, 2019(05): 93-96.
- [12]. Xia Wenjing, Chen Kaijian. Analysis Of The Main Influencing Factors Of Inbound Tourism Revenue In Sichuan Province Based On Multiple Regression Models. *Hubei Agricultural Mechanization*, 2019(16): 135-136.
- [13]. Zhang Yanqiu. Analysis Of The Influencing Factors Of Tourism Revenue In Gansu Province. *Economic Research Guide*, 2019(23): 102-103+121.
- [14]. Li Ying, Li Wenxin, Tian Yuzhu. Analysis Of The Influencing Factors Of Tourism Revenue In Luoyang City Based On Principal Component Regression And Suggestions For Tourism Development. *Value Engineering*, 2019, 38(14): 138-140.
- [15]. Statistical Bureau Of Sichuan, Investigation Team Of National Bureau Of Statistics In Sichuan. *Sichuan Statistical Yearbook - 2019* (37): 474-475.
- [16]. Park, D., Et Al., Factors Influencing Social Capital In Rural Tourism Communities In South Korea. *Tourism Management*, 2012, 33(6): P. 1511-1520.
- [17]. Student, J., M.R. Kramer And P. Steinmann, Simulating Emerging Coastal Tourism Vulnerabilities: An Agent-Based Modeling Approach. *Annals Of Tourism Research*, 2020, 85: 10.1016/J.Annals.2020.103034.
- [18]. Cronjé, D.F. And E. Du Plessis, A Review On Tourism Destination Competitiveness. *Journal Of Hospitality And Tourism Management*, 2020, 45: P. 256-265.
- [19]. Barkauskas, V., K. Barkauskienė And E. Jasinskis, Analysis Of Macro Environmental Factors Influencing The Development Of Rural Tourism: Lithuanian Case. *Procedia - Social And Behavioral Sciences*, 2015, 213: P. 167-172.
- [20]. Kumar, S. And A. Dhir, Associations Between Travel And Tourism Competitiveness And Culture. *Journal Of Destination Marketing & Management*, 2020, 18: 10.1016/J.Jdmm.2020.100501.
- [21]. Liu Suhe, Sun Haiyan, Li Shaoqi, Qin Weishan. Analysis Of Regional Differences And Influencing Factors Of The Inbound Tourism Economy In Shandong Province. *Journal Of Ludong University (Natural Science Edition)*, 2020, 36(03): 279-288.

- [22]. Yuan Yu, Wu Lianglin. Analysis Of Spatial-Temporal Characteristics And Influencing Factors Of Tourism Ecological Security In Guangxi Based On A Geographic Detector. *Popular Science And Technology*, 2020, 22(05): 29-32.
- [23]. Sun Zeqian, Yang Xiaoxia, Zeng Yujia. Study On The Influencing Factors Of Spatial Differentiation Of Tourism Development Level In Chongqing Based On A Geographic Detector. *Journal Of Southwest China Normal University (Natural Science Edition)*, 2019, 44(04): 57-63.
- [24]. Liu Changxue. Classification Of Self-Driving Tourists Based On Attitude And Behavior: A Case Study Of Suzhou City. *Resource Development & Market*, 2013, 29(08): 889-893.
- [25]. Karachi, Pakistan Tourism-Led Growth Hypothesis: A Case Study Of Pakistan. *Asia Pacific Journal Of Tourism Research*, 2013 Vol. 18, No. 4, 303-313.
- [26]. Michael, N., Y. Reisinger And J.P. Hayes, The UAE's Tourism Competitiveness: A Business Perspective. *Tourism Management Perspectives*, 2019, 30: P. 53-64.
- [27]. Zheng Cailiang, Chen Manlin, Chen Guisong, Lin Xiaoying. Study On The Influencing Factors Of Forest Park Tourism Revenue Based On Provincial Panel Data From 2010 To 2017. *China Forestry Economics*, 2019 (05): 93-96.
- [28]. Chen Ni, Li Sijia, Zhang Caihong. Analysis Of Temporal And Spatial Differences In Tourism Revenue In Guangxi And Its Influencing Factors. *Journal Of Beijing Forestry University (Social Sciences)*, 2019, 18(02): 73-80.
- [29]. Wang Yu, Yu Xiaoling. Analysis Of Influencing Factors Of Tourism Economy In Urumqi City Based On Grey Relational Degree. *Journal Of Tarim University*, 2019, 31(01): 38-45.