A Study on the Impact of the Opening of High-Speed Rail on Residents' Inclination for Tourism Destination Selection in Kunming City

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Abstract—The opening of high-speed rail has greatly improved the convenience of travel, significantly reducing the travel time and costs for tourists, and has a significant impact on the selection of tourist destinations. By collecting relevant data and using methods such as Autoregressive Distributed Lag Model (ARDL) and Pearson correlation test, the effects of high-speed rail on the tourism flow, destination market structure, and spatial characteristics of tourism demand in Kunming were analyzed. The results are as follows: The impact of high-speed rail on the destination choice of Kunming residents is complex. For out-of-province tourist flows, the effect of high-speed rail has a lagged effect and does not immediately produce an impact. It shows a negative effect within one month of the lag period, and only after two months does it have a positive promoting effect; The opening of high-speed rail can increase the market concentration of tourist destinations in a short period of time, leading to a short-term "Matthew effect"; In terms of spatial distribution, the preferred regions for tourism demand among Kunming residents are distributed in multiple centers, mainly focusing on 5A-level scenic areas in northwest, southeast, and north China regions. Most of these scenic areas are located far from Yunnan. The regions where tourism demand inclinations decrease are mainly concentrated in 5A-level scenic areas in southwest, northeast, and central China regions; For scenic areas that are closer or farther in spatial distance, the number of Kunming residents' increased tourism demand inclinations outweighs the number of decreased inclinations. The opening of high-speed rail has a positive promoting effect on the tourism demand inclinations for both closer and farther scenic areas, and there is a greater inclination towards out-of-province scenic areas.

Keywords—*High-speed rail; tourism flow; Autoregressive Distributed Lag Model (ARDL); inclination; spatial distance.*

I. INTRODUCTION

Tourism is a spatial activity where tourists travel from their origin to a destination, and it is influenced by factors such as the attractiveness of the tourist destination, tourist behavior, and transportation conditions. The changes in transportation conditions have a significant impact on tourism activities. High-speed rail originated in Japan in the 1960s and has since expanded to other countries and regions. China has now established a comprehensive high-speed rail network, enabling interconnectivity between regions. Accessibility has always been an important factor influencing tourists' choice of destination. With the gradual improvement of the high-speed rail network, it has become a crucial mode of transportation for people's travel. The "time-space compression" effect of high-speed rail expands the market radius of tourist destinations [1], altering the spatial pattern of tourism and the structure of tourist markets [2]. This not only has a significant impact on the economic development of tourist destinations but also facilitates the travel of residents from the tourist origin. At the same time, it also leads to changes in tourists' travel inclinations.

The impact of high-speed rail on tourism has been a hot topic in tourism research, with studies mainly focusing on its effects on tourism demand, tourism competition, and tourism economic growth. Research on the topic started earlier in countries where high-speed rail was introduced earlier [3]. In the early stages, the research mainly focused on the impact of high-speed rail on the demand for other transportation modes, travel time, travel behavior, tourism revenue, and the spatial structure of tourist destinations [4]. In recent years, Research in other countries on the impact of high-speed rail on tourism has gradually become more in-depth. Ravazzoli et al. analyzed the impact of high-speed rail on accessibility using six trans-Alpine high-speed rail lines as examples [5]. Albalate et al. assessed the impact of high-speed rail on tourism in Spain [6]. Luis et al. studied the role of high-speed rail in promoting cultural tourism [7]. Pagliara et al. found that high-speed rail has a significant influence on tourists' destination choices [8]. Compared to research in other countries, Chinese research on the impact of high-speed rail on tourism started later but has developed rapidly. The studies mainly focus on the impact of high-speed rail on tourism economy [9]-[13], tourism industry [14]-[18], tourism demand [19]-[22], tourism spatial patterns [23][24], and tourism flow [25]-[32]. A comprehensive review of relevant studies worldwide reveals that there is a considerable amount of research on the impact of high-speed rail on tourism, covering multiple dimensions and utilizing various analytical methods. This provides a certain level of theoretical support and methodological references for this study. However, there is relatively less research on the influence of high-speed rail on tourists' destination inclinations, and the existing studies often rely on questionnaire survey data with limited sample sizes.

Kunming, located on the southwestern border of China, is a famous historical and cultural city with rich tourism resources. With the development of the economy, the number of people from Kunming traveling to other provinces has gradually increased. Kunming South Station was officially opened on December 28, 2016, and the opening of the high-speed rail has had a significant impact on the travel inclinations of Kunming residents. This study takes Kunming as a case, relying on Baidu Index to collect data on the online attention of Kunming residents to 5A-level scenic areas from 2011 to 2019. The study uses methods such as Autoregressive Distributed Lag Model, primacy index, inclination index, diffusion index, Pearson correlation test, and regression analysis to analyze the impact of high-speed rail opening on residents' tourism demand inclinations. The aim is to enrich and improve the research on the impact of high-speed rail on tourism and provide theoretical basis for the development of tourist markets in scenic areas and the promotion of regional tourism development.

II. DATA SOURCE AND RESEARCH METHODOLOGY

A. *Data sources*

In 2007, the China National Tourism Administration decided to approve the establishment of 5A-level tourist attractions. As of 2021, the Ministry of Culture and Tourism of China has designated a total of 306 national 5A-level tourist attractions. 5A-level attractions are high-quality scenic areas in China that have strong appeal, large visitor flows, relatively high online attention, and possess high typicality and research value. There is a close positive correlation between the online attention and visitor flows of these attractions, which are often used to analyze the spatiotemporal characteristics, network structure, and traffic prediction of tourism flows [30]-[32]. This article relies on Baidu Index to collect data on the online attention of residents in Kunming City towards 31 provinces and regions in China (excluding Hong Kong, Macau, and Taiwan) from 2011 to 2019. This data will be used to analyze the impact of the opening of high-speed rail on the travel inclinations of residents in Kunming City. Additionally, spatial distances between Kunming City and each of the 5A-level tourist attractions need to be collected, and this data will be obtained through Baidu Maps.

B. *Research Methodology*

1) Autoregressive Distributed Lag (ARDL) Model. In 1966, Jorgenson proposed the (p, q) order Autoregressive Distributed Lag (ARDL) model, which has the basic equation (1):

$$y_t = \propto + \varphi_1 y_{t-1} + \varphi_2 y_{t-2} + \cdots + \varphi_p y_{t-p} + \sum_{i=0}^{\tau_1} \beta_i' X_{t-i} + u_t - \theta_1 u_{t-1} - \theta_2 u_{t-2} - \cdots - \theta_q u_{t-q} \quad (1)$$

In equation (1), X_{t-i} is the lagged vector of exogenous variables for the *i*-order (with the same dimension as the number of variables), and the maximum lag order for each exogenous variable is τ_i. β_i is a parameter vector [30]. This study uses it to analyze whether the opening of high-speed rail has an impact on the destination choices of residents in Kunming City and the duration of the impact.

2) Urban Primacy Index. In 1939, Jefferson (M. Jefferson) proposed the "Primate City Law" as a generalization of the distribution pattern of urban size within a country. Later, this index was commonly used to reflect the degree of concentration of regional development factors in the largest region [33]. This study applies it to analyze the degree and changes in inclination concentration of residents in Kunming City for 306 5A-level scenic areas. The calculation formula is as equation (2):

$$S = P_1 / P_2 \quad (2)$$

In equation (2), S represents urban primacy index, which has a critical value of 2. P_1 denotes the network attention of the top-ranked scenic area, while P_2 represents the network attention of the second-ranked scenic area. When S > 2, it indicates an excessive concentration of the tourism destination market structure among residents of Kunming City. When S ≤ 2, it indicates a moderate concentration of the tourism destination market structure among residents of Kunming city.

Due to the large number of scenic areas, it is difficult for the primacy index of only two scenic areas to comprehensively reflect the degree of concentration in the tourism destination market structure among residents of Kunming City. Therefore, this study introduces the Four Scenic Spot Index and the Eleven Scenic Spot Index. The calculation formulas are as equation (3) and (4):

$$S = P_1 / (p_2 + P_3 + P_4) \quad (3)$$

$$S = 2P_1 / (p_2 + P_3 + \cdots + P_{11}) \quad (4)$$

In equation (3) and (4), S has a critical value of 1, and P_1 to P_{11} represent the network attention rankings of the top 1 to 11 scenic areas. When S > 1, it indicates excessive concentration. When S ≤ 1, it indicates moderate concentration.

3) Tourism Inclination Index. This study utilizes the inclination index proposed by Sun Gennian to analyze the tourism demand inclinations of residents in Kunming City for 5A-level scenic areas [34]. The calculation formula is as equation (5):

$$\beta_i = \frac{X_i}{\sum_i Xi} \cdot 100\% \quad (5)$$

In equation (5), β_i represents the inclination index of residents in Kunming City for the i scenic area, X_i represents the tourism demand (network attention) of residents in Kunming City for the i scenic area, and $\sum_i Xi$ represents the total value of tourism demand (network attention) for all scenic areas in Kunming City. The values of β_i range between 0 and 1, where a higher value indicates a stronger inclination of residents in Kunming City for the i scenic area.

4) Diffusion Index. This study uses it to measure the changes in the tourism destination market among residents in Kunming [35]. The calculation formula is as equation (6):

$$\Gamma = 100 \cdot \sqrt{\sum_{i=1}^{n} \left(\frac{X_i}{T}\right)} \quad (6)$$

In equation (6), Γ represents the diffusion index, X_i represents the tourism flow (network attention) of residents in

Kunming City towards the i-th scenic area, and T represents the total tourism flow (total network attention) of residents in Kunming City towards the 306 scenic areas. A larger value of Γ indicates a greater concentration of tourism flow diffusion towards certain scenic areas in Kunming, which is unfavorable for the balanced development of tourism destinations in Kunming. Conversely, a smaller value of Γ indicates a more dispersed diffusion of tourism flow towards different scenic areas in Kunming, which is beneficial for the balanced development of tourism destinations in Kunming.

III. RESULT ANALYSIS

A. Data analysis based on the ARDL model

The article primarily uses the Eviews10 tool to explore whether the opening of high-speed rail has an impact on the flow of tourists visiting Kunming and the duration of that impact. Since the opening of high-speed rail in Kunming is relatively recent and Yunnan Province itself has abundant tourism resources, the study selects the Baidu Index of Kunming residents' interest in 5A-level scenic areas both within and outside Yunnan Province from 2011 to 2019 as variables y_1 and y_2. Additionally, a dummy variable D_t is introduced to analyze the impact of high-speed rail opening on the tourism flow in Kunming and the duration of that impact. Considering the seasonal trend of tourism activities, it is necessary to first seasonally adjust the series y_1 and y_2 using the Census X12 method to eliminate the influence of seasonal factors and obtain time series y_{1t} and y_{2t}. Then, the natural logarithm is taken for y_{1t} and y_{2t} to scale down the values, resulting in $\ln y_{1t}$ and $\ln y_{2t}$. From Table 1, it can be observed that variables $\ln y_{1t}$, $\ln y_{2t}$, and D_t are all integrated of order one, denoted as I (1), which meets the requirement for ARDL modeling.

Table 1. Test results of ADF

Series	ADF test statistic	1% critical value	5% critical value	10% critical value	test results
$\ln y_{2t}$	0.9575	-2.5868	-1.9439	-1.6147	non-stationarity
$d(\ln y_{2t})$	-11.7372	-2.5870	-1.9439	-1.6147	stationarity
$\mathrm{Ln}\, y_{1t}$	0.9142	-2.5868	-1.9439	-1.6147	non-stationarity
$d(\ln y_{1t})$	-11.0256	-2.5870	-1.9439	-1.6147	stationarity
D_t	0	-2.5868	-1.9439	-1.6147	non-stationarity
$d(D_t)$	-10.2470	-2.5870	-1.9439	-1.6147	stationarity

Performing an OLS regression of the variable $\ln y_{2t}$ on $\ln y_{1t}$ and D_t allows us to obtain the model estimation residuals. A unit root test is conducted on these residuals, and the test results are shown in Table 2. The test statistic is -3.792013, which is smaller than the critical value of -2.586753 at a significance level of 1%. This indicates that the residual sequence is stationary. Consequently, we can conclude that the sequences $\ln y_{1t}$, $\ln y_{2t}$, and D_t have a cointegration relationship, which suggests that they can be used for model estimation.

Table 2. ADF test results of the residual sequence

		t-statistic	P value
ADF test statistic		-3.792013	0.0002
Significance level:	1% level	-2.586753	
	5% level	-1.943853	
	10% level	-1.614749	

Based on the Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC), and significance level, an appropriate lag order can be determined. By considering these criteria, it was found that the suitable lag order for this study is (4,4,2) for the ARDL model, which is shown in following equation (7).

$$\mathrm{Ln}y_{2t} = c + \alpha_1 \ln y_{2t-1} + \alpha_2 \ln y_{2t-2} + \alpha_3 \ln y_{2t-3} + \alpha_4 \ln y_{2t-4} + \beta_0 \ln y_{1t} + \beta_1 \ln y_{1t-1} + \beta_2 \ln y_{1t-2} + \beta_3 \ln y_{1t-3} + \beta_4 \ln y_{1t-4} + \gamma_0 D_t + \gamma_1 D_{t-1} + \gamma_2 D_{t-2} + u_t \quad (7)$$

In equation (7), $\ln y_{2t}$ represents the transformed tourist flow of Kunming residents to 5A-level scenic areas outside the province. $\ln y_{2t-1}$, $\ln y_{2t-2}$, $\ln y_{2t-3}$, $\ln y_{2t-4}$ denote the lagged tourist flows up to four periods. $\ln y_{1t}$ represents the transformed tourist flow of Kunming residents to 5A-level scenic areas outside the province, and $\ln y_{1t-1}$, $\ln y_{1t-2}$, $\ln y_{1t-3}$, $\ln y_{1t-4}$ represent the lagged tourist flows up to four periods. γ_0, γ_1, and γ_2 are the coefficients indicating the impact of high-speed rail opening on periods t, t-1, and t-2 respectively. C represents the constant term, and u_t is the random disturbance term.

Based on equation (7), the equation estimation is conducted. The t-test results for the coefficients of each explanatory variable are used to sequentially eliminate variables that are not significant (with significance levels exceeding 10%). The results are shown in Table 3. The simplified ARDL model demonstrates not only significant coefficients for all explanatory variables but also a high overall fit. The adjusted R^2 value reaches 0.9880. Furthermore, conducting a first-order LM test on the residuals yields a chi-square probability of 0.4148, indicating that the residual sequence does not exhibit autocorrelation under the null hypothesis.

Table 3. ARDL model estimation results

variables	estimated coefficients	standard deviation	t- statistic	P value
C	1.4987	0.3224	4.6490	0
$\mathrm{Ln}\, y_{2t}$(-1)	0.5711	0.0904	6.3176	0
$\mathrm{Ln}\, y_{2t}$(-2)	0.2603	0.0936	2.7814	0.0065
$\mathrm{Ln}\, y_{2t}$(-4)	−0.1320	0.0369	−3.5786	0.0005
$\mathrm{Ln}\, y_{1t}$	0.6624	0.0376	17.6127	0
$\mathrm{Ln}\, y_{1t}$(-1)	−0.3373	0.0770	−4.3828	0
$\mathrm{Ln}\, y_{1t}$(-2)	−0.1116	0.0666	−1.6753	0.0972
D_t(-1)	−0.0899	0.0479	−1.8775	0.0635
D_t(-2)	0.1796	0.0504	3.5609	0.0006
R^2	0.9890			

Adjusted R^2	0.9880			

Due to the opening of Kunming South Railway Station, residents of Kunming have different choices when it comes to selecting their tourism destinations. The selection of 5A-level tourist destinations within the province by Kunming residents significantly influences their choice of 5A-level scenic areas outside the province. From Table 3, it can be observed that the selection of 5A-level scenic areas outside the province by Kunming residents is influenced by their selection of 5A-level scenic areas within the province, with a lag effect spanning three periods. The impact in the current period is positive, while the impacts in the first and second lagged periods are negative. This suggests that the influence of selecting 5A-level scenic areas within the province on the choice of 5A-level scenic areas outside the province by Kunming residents is relatively rapid. Moreover, since Yunnan itself has abundant tourism resources, the choice of 5A-level tourist destinations outside the province by Kunming residents is influenced by 5A-level scenic areas within the province, and this effect fluctuates over time. Additionally, the impact of high-speed rail opening on the choice of 5A-level scenic areas outside the province by Kunming residents can be observed over two periods. The impact in the first lagged period is negative, while the impact in the second lagged period is positive and more significant. This indicates that the impact of high-speed rail opening has a lag effect. Within a certain period, the choice of non-local tourist destinations by Kunming residents remains "relatively stable." This suggests that the opening of high-speed rail does not immediately produce an impact and initially has a negative effect in the lagged one-month period, only to yield a positive promotion effect after a two-month lag. The reason behind this may be that short-term tourism demand is influenced by factors such as the level of economic development, holidays, and spatial distance. The opening of high-speed rail does not immediately generate positive effects. This study will focus on analyzing the impact of spatial distance on the changes in destination inclination of Kunming residents after the opening of high-speed rail.

B. Changes of destination inclination based on the primacy index and the diffusion index

Based on the network attention data and equation (2)-(4) and (6), the primacy index of tourist destinations and diffusion index from 2011 to 2019 is calculated, and the results are shown in Table 4. From Table 4, it can be observed that the overall market structure of tourist destinations for residents of Kunming tends to be more diversified. Primacy indices of the two, four, and eleven tourist destinations exhibit a decreasing trend. In 2017, primacy indices of the two and four tourist destinations rapidly increased, but they quickly declined after 2018. This indicates that the opening of the high-speed rail system promoted the concentration of the tourist destination market structure in the short term. From Table 4, it can also be observed that the dispersion index of tourist destinations for Kunming residents was relatively high from 2011 to 2019. The tourist flow from Kunming was concentrated in a few destinations, which is highly unfavorable for the balanced and sustainable development of tourist destinations in Kunming.

Table 4. Primacy index and dispersion index of tourist flow from Kunming residents among tourist destinations

year/index	**Primacy indices of the two tourist destinations**	**Primacy indices of the four tourist destinations**	**Primacy indices of the eleven tourist destinations**	**diffusion index**
2011	2.28	0.78	0.22	99.96
2012	2.36	0.8	0.29	99.96
2013	1.92	0.72	0.3	99.98
2014	1.91	0.71	0.3	99.98
2015	1.58	0.67	0.29	99.98
2016	1.27	0.59	0.28	99.99
2017	1.78	0.74	0.26	99.99
2018	1.28	0.56	0.23	99.99
2019	1.28	0.56	0.23	99.99

C. Destination inclination changes based on inclination index

Based on the collected network attention data of various tourist destinations and equation (5), the inclination index for the tourist demand of Kunming residents for 306 5A-level tourist destinations across the country was calculated for the 3 years before and after the opening of the high-speed rail (2013-2015 and 2017-2019). The average values of the inclination index for tourist demand of Kunming residents for each destination were calculated separately. By subtracting the average inclination index for tourist demand of Kunming residents for each destination after the high-speed rail opening from the average inclination index for tourist demand of Kunming residents for each destination before the high-speed rail opening, the impact of the high-speed rail on the destination inclination of Kunming residents can be calculated. The results can be divided into two categories: for 143 destinations, including Yungang Grottoes, with a positive difference in the inclination index for tourist demand, it indicates that the inclination of Kunming residents for these 5A-level destinations has increased after the high-speed rail opening. These destinations are mostly located far away from Kunming. On the other hand, for 132 destinations including Lijiang Ancient Town, with a negative difference in the inclination index for tourist demand, it suggests a decrease in the inclination of Kunming residents for these 5A-level destinations after the opening of the high-speed rail. The spatial distribution of these destinations is shown in Fig 1.

In order to analyze the changes in tourist demand inclination index among residents of Kunming before and after the opening of the high-speed rail, excluding 31 scenic areas that were not included in Baidu Index, this study used Baidu Maps to calculate the spatial distances from Kunming to 275 5A-level scenic areas across China and divided them into eight categories：

1) within the range of 0-500 kilometers: the tourist demand inclination increased for 9 scenic areas, including Qingyan Ancient Town. These 9 scenic areas, except for the Shilin Scenic Area, are located outside the province. On the other hand, the tourist demand inclination decreased for 7 scenic areas, including Jade Dragon Snow Mountain, all of which are located within Yunnan Province. When choosing scenic areas that are relatively close, the high-speed rail has a positive effect on increasing the inclination for out-of-province tourist destinations.

2) Within the range of 500-1000 kilometers: the tourist demand inclination increased for 19 scenic areas, including Nanshan Cultural Tourism Area, while it decreased for 22 scenic areas, including Daxiao Dongtian.

3) Within the range of 1000-1500 kilometers: the tourist demand inclination increased for 41 scenic areas, including Tianzhuzhai, while it decreased for 36 scenic areas, including Yunnan Rainforest Cultural Tourism Area.

4) Within the range of 1500-2000 kilometers: the tourist demand inclination increased for 50 scenic areas, including Shanghai Wild Animal Park, while it decreased for 43 scenic areas, including Oriental Pearl Tower.

5) Within the range of 2000-2500 kilometers: the tourist demand inclination increased for 9 scenic areas, including Gong Wang Fu, while it decreased for 18 scenic areas, including the Forbidden City.

6) Within the range of 2500-3000 kilometers: the tourist demand inclination increased for 11 scenic areas, including Jingyuetan, while it decreased for 5 scenic areas, including Changying Century City.

7) Among the scenic areas beyond 3000 kilometers: the tourist demand inclination increased for 4 scenic areas, including Wudalianchi, while it decreased for the Taiyang Island.

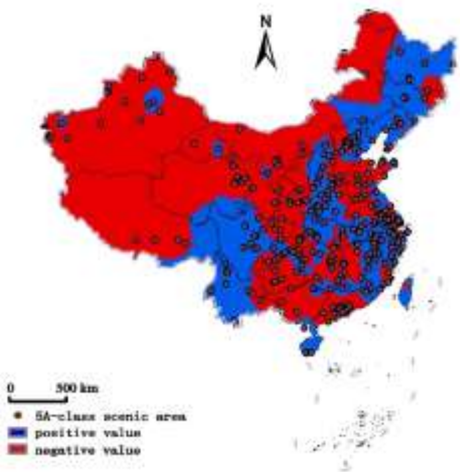

Fig 1. Contour Map of the Difference in Tourist Demand Inclination Index

We can observe that for scenic areas located at both relatively close and far distances, the number of scenic areas with increased tourist demand inclination is greater than the number of scenic areas with decreased tourist demand inclination. The opening of the high-speed rail has a positive promoting effect on the tourist demand inclination for both close and distant scenic areas, with a greater inclination towards out-of-province scenic areas.

From the above analysis, it can be observed that after the opening of the high-speed rail, residents' inclination for tourist demand in distant 5A-level scenic areas has increased, while their inclination for nearby scenic areas, especially those within Yunnan province, has decreased. This is due to the improved accessibility of distant scenic areas after the high-speed rail opening. The results are shown in Table 5.

Table 5. Correlation analysis between spatial distance and changes in residents' online attention

		Spatial distance
Changes in Residents' Online Attention	Pearson correlation	-0.270[a]
	Sig. (two-tailed)	0.000
	Number of cases	275

[a] Correlation is significant at the 0.01 level (two-tailed).

From Table 5, it can be observed that at a significance level of 1%, there is a negative correlation between the change in residents' online attention and spatial distance after the introduction of high-speed rail. This indicates that the farther the spatial distance, the weaker the promoting effect of high-speed rail on residents' online attention. To further investigate the relationship between these two factors, this study uses the change in residents' online attention to 5A-level scenic areas before and after the introduction of high-speed rail as the dependent variable and the spatial distance from Kunming to each 5A-level scenic area as the independent variable. Ordinary Least Squares (OLS) regression analysis is conducted, and the results are presented in Table 6.

Table 6. Regression Analysis Results [b]

	Regression coefficients	Significance
Constant	41696.136	0.000
distance	-11.84	0.000

[b] Dependent variable: Change in online attention

From Table 6, it can be observed that for every 1 km increase (or decrease) in spatial distance, the change in online attention due to the high-speed rail opening decreases (or increases) by 11.84 person-times.

IV. CONCLUSION

This study collected data on the online attention of Kunming residents towards Chinese 5A-level scenic areas from 2011 to 2019. By utilizing autoregressive distributed lag models, centrality measures, and tourism demand inclination indices, the study analyzed the effects of high-speed rail opening on tourism flows, destination market structure, and spatial characteristics of tourism demand in Kunming. The results revealed the following findings:

Firstly, the impact of high-speed rail opening on the destination choices of Kunming residents is complex. For out-of-province tourism flows, the effect of high-speed rail exhibits a lagged pattern and does not have an immediate impact. Within the first month of the lag period, the effect is negative, and it only becomes positive after a lag of two months. This may be due to short-term tourism demand being influenced by factors such as economic development, holidays, and spatial distance. The opening of high-speed rail does not immediately generate positive effects. Additionally, high-speed rail opening leads to an increase in centrality measures in the short term, indicating a relatively concentrated market for tourist destinations. This suggests a short-term "Matthew effect" where high-speed rail facilitates more convenient travel for Kunming residents. However, over time, this concentration diminishes. In terms of spatial characteristics, the study found that the regions where the tourism demand inclination of Kunming residents increases exhibit a multi-centered distribution, primarily focusing on 5A-level scenic areas in Northwest China, Southeast China, and North China. Most of these scenic areas are located far from Yunnan Province. Conversely, the regions with decreased tourism demand inclination are concentrated in Southwest China, Northeast China, and Central China, including several 5A-level scenic areas. Particularly, the tourism demand inclination for 5A-level scenic areas within Yunnan Province mostly decreased. Furthermore, the study found that the number of scenic areas with an increased tourism demand inclination is greater than those with a decreased inclination, both for closer and more distant destinations. High-speed rail opening has a positive promoting effect on the tourism demand inclination for both nearby and distant scenic areas, with a stronger inclination towards destinations outside the province. Moreover, the study revealed a negative correlation between the change in online attention of residents and spatial distance after the high-speed rail opening. This indicates a distance decay effect, where the impact of high-speed rail on online attention diminishes as the distance increases. In conclusion, this study provides insights into the effects of high-speed rail opening on tourism demand and inclinations in Kunming. The findings highlight the complex relationship between high-speed rail, destination choices, market structure, and spatial characteristics of tourism demand. They contribute to the understanding of destination marketing and development strategies.

This study, based on online attention, sheds light on the influence of high-speed rail opening on the destination inclination of Kunming residents to some extent, enriching the related research and providing valuable insights for the tourism destination market. However, there are certain limitations in this study. Firstly, although online attention is closely related to tourist flows, it does not directly equate to tourist flows. Many tourists do not make their travel decisions based on online platforms like Baidu, and destination inclination may not be the primary consideration for some travelers. Secondly, some scenic areas were not included in the Baidu Index data, and some areas have multiple attractions, requiring separate searches and summation. This may introduce some bias in the research results. Furthermore, the time series data used in constructing the autoregressive distributed lag models in this study are relatively short, which may not comprehensively reflect the impact of high-speed rail opening on tourism flows in Kunming. Lastly, the study does not account for major events or the influence of high-speed rail opening in the destination regions, which could introduce a certain degree of bias in the results. These aspects will be gradually improved and addressed in future research endeavors.

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