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Article

Research on the Integrated Development of Homestay Hotels and Rural Tourism under the Background of the Rural Revitalization Strategy

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Abstract: Under the background of the rural revitalization strategy, homestay hotels and rural tourism have highly compatible development goals and service subjects. Homestay hotels are the foundation for improving and enhancing the quality and efficiency of rural tourism, while rural tourism is an effective path for the construction of homestay hotels. This paper constructs an index system for the comprehensive development of homestay hotels and rural tourism, and uses the entropy method to measure the comprehensive development level of homestay hotels and rural tourism in Anhui Province from 2010 to 2024. By combining the coupling coordination degree model and the kernel density estimation method, this study explores the temporal and spatial changes of the integration development of homestay hotels and rural tourism in Anhui Province, and introduces the geographical detector model to deconstruct the influencing factors of their integration. The research results show that the coupling coordination degree has been continuously rising from 2010 to 2022, slightly declined and stabilized from 2023 to 2024. The kernel density map of the integration development of the two in Anhui Province from 2010 to 2022 changed from a "single peak" to a "double peak", the regional differences increased first and then decreased, and the green development influence between cities presented a "south high north low" situation. Scientific and technological innovation, regional opening-up degree, and economic development level are the most important factors affecting the integration development of the two.

Keywords: Homestay hotels; Rural tourism; Entropy method; Coupling coordination degree model; Kernel density estimation; Geographical detector model

1. Introduction

As an important driving force for rural revitalization, rural tourism is regarded as an effective way for the transformation of rural economic development models, the upgrading of industrial structure, and the coordinated development of the tertiary industry. It is an important means to promote rural social progress, explore effective governance structures suitable for rural internal development, and is also an important way to restore and inherit rural culture and improve rural ecological environment [1-3]. In 2018, the "Opinions on Implementing the Rural Revitalization Strategy" put forward comprehensive requirements for the all-round development of rural tourism, and the No. 1 Central Document further emphasized the importance of rural tourism. The No. 1 Central Document in 2024 clearly proposed to implement the deep integration of rural culture and tourism, and promote the construction of rural tourism clusters. As the political, economic and cultural center of rural areas, the county has the ability to integrate rural resources. Scientific planning and integration of rural natural landscapes, historical culture, folk customs and other resources can form distinctive rural tourism products, providing necessary infrastructure and service support for rural tourism, and improving the convenience and comfort of rural

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tourism [4-5].

Rural inns, as an organic part of rural tourism, can provide tourists with a new experience through their unique cultural advantages, regional advantages and folk customs advantages [6]. Rural inns and rural tourism are a unified system, and have important value in promoting and facilitating rural revitalization. The mechanism of their effect is to drive economic development through the tourism industry, thus meeting the requirements of the rural revitalization strategy such as industrial prosperity, ecological livability, rural civilization and prosperous life [7-9]. However, in the process of the development of rural inns in China, there are many problems, resulting in the inability to fully demonstrate the functions and values of rural inns and rural tourism [10]. Some rural inns in China have problems such as copying, imitating and applying urban inns, hotels and guesthouses, which makes it difficult to reflect local cultural characteristics, folk customs and other elements in the inn services, affecting the overall experience of rural life and the quality of local tourism economy development [11-13]. In terms of resource integration, rural inns have not been fully integrated with rural tourism, and even some villages have the problem of the separation of rural inns and rural tourism [14], each acting independently, which hinders the penetration of rural tourism characteristics into different links and processes of inn services, and restricts the growth of inn economy.

Many scholars and experts advocate integrating rural tourism with rural inns [15-17], by integrating rural regional culture, historical culture, ethnic culture and intangible cultural heritage, to exert the value of rural inns in rural revitalization, and make the goals of the rural revitalization strategy better realized through rural inns and rural tourism [18]. However, the accommodation industry and the cultural industry have difficulty forming a bond for mutual communication and interaction, resulting in the inability to form a pattern of integration of rural tourism and rural inns.

This paper uses the time series data of 15 years (from 2010 to 2024) of the homestay hotels and rural tourism systems in Anhui Province as the research sample. Seven indicators are selected from each of the two systems (homestay hotels and rural tourism) to construct an index system. The numerical values of the indicators are standardized without dimensionality. The entropy method is adopted to determine the weights of the indicators, and a coupling degree model for the development of the two systems is constructed. The spatial evolution characteristics of the integration and development of homestay hotels and rural tourism are analyzed by using the kernel density estimation method. Then, taking the coupling coordination degree as the dependent variable, the driving factors of the integrated and coordinated development of homestay hotels and rural tourism are analyzed by combining the geographical detector model.

2. Measurement Model for the Integration of Homestay Hotels and Rural Tourism Development

2.1. Research Area and Data Sources

2.1.1. Overview of the Research Area

Anhui Province is located in the central-eastern part of China, with a total area of 139,600 square kilometers, accounting for approximately 1.45% of the country's total land area. It is situated in the transitional zone between the warm temperate zone and the subtropical zone, with a mild climate and distinct four seasons. The Yangtze River and the Huaihe River run through the entire province, dividing it into three natural regions: north, middle and south. The geographical features blend the differences between the north and the south of China. To the north of the Huaihe River, it has a warm temperate semi-humid monsoon climate, while to the south, it is a subtropical humid monsoon climate. The annual average temperature ranges from 14 to 17 degrees Celsius, with an average of 1,800 to 2,500 hours of sunshine and an average precipitation of 800 to 1,800 millimeters.

Anhui Province is a major agricultural province and also a province rich in tourism resources. It has favorable conditions and urgency for promoting rural revitalization and developing rural tourism. By the end of 2018, the total population of the province was 70.83 million, among which the rural population was 53.7966 million. Additionally, according to the estimation by the Anhui Provincial Department of Culture and Tourism, the number of tourists received by rural tourism in the province exceeded 300 million in 2019. There are a total of 260 outstanding tourist towns in the province, 333 key villages for poverty alleviation through rural tourism, 496 rural tourism demonstration villages, over 170 A-level tourist villages, 2,344 star-rated rural inns, 3,266 characteristic guesthouses, and rural tourism has lifted 317,000 people out of poverty. In addition, 12 key rural tourism villages including San Gu Commune in Chaohu City, Liangli Village in Dangshan County, and Xiaogao Village in Fengyang County have been included in the first batch of national key rural tourism villages list. The number ranks third in the country.

2.1.2. Data Sources and Processing

To measure the coupling relationship between homestay hotels and rural tourism in Anhui Province, this study uses the time series data of the homestay hotel and rural tourism system from 2010 to 2024, a total of 15 years, as the indicators. The data mainly come from the "Anhui Statistical Yearbook 2011-2025", and some missing data mainly come from the "National Economic and Social Development Statistical Bulletin of Anhui Province" from 2010 to 2024. Due to the different unit scales and order of magnitude of the indicator data, to ensure accuracy, according to the nature of each indicator, the methods of normalization by positive transformation, inverse transformation and maximum-minimum standardization are adopted to perform dimensionless processing.

Positive indicators:

$$x_{ij} = \left(X_{ij} - Min \right) \Big/ \left(Max - Min \right) \tag{1}$$

Negative indicators:

$$x_{ij} = \left(Max - X_{ij} \right) \Big/ \left(Max - Min \right) \tag{2}$$

In the formula, X_{ij} represents the original value of the j -th indicator of the i -th object, Max and Min refer to the maximum and minimum actual values of the j -th indicator among all objects, and x_{ij} represents the standardized value after normalization.

2.2. Construction of Evaluation Index System

The integrated and coordinated development system of homestay hotels and rural tourism is a complex system composed of two subsystems: homestay hotels and rural tourism. Based on the existing research results and following the principles of accessibility, scientificity, representativeness, dynamics, and comparability, corresponding core indicators are selected from the two subsystems of homestay hotels and rural tourism to construct the index system of the comprehensive evaluation model. This paper, based on the evaluation index system constructed by relevant scholars, has built an evaluation index system for the integrated development of homestay hotels and rural tourism. The specific indicators are shown in Table 1.

Homestay Hotel Development System: It consists of three primary indicators: supply scale, operation quality, and industrial drive. The secondary indicators selected are the number of regional homestay hotels (houses), bed density (beds per square kilometer), average annual occupancy rate (%), OTA platform approval rate (%), and proportion of homestay tourism employees (%). All indicators are positive, and the larger the value, the better the development level of homestay hotels.

Rural Tourism Development System: It consists of four primary indicators: resource foundation, tourism supply, tourism environment, and tourism benefits. The secondary indicators selected are the number of A-level scenic spots, the number of leisure agriculture and rural tourism demonstration parks (points), the number of star hotels, the number of tourism employees, forest coverage rate, the proportion of days with good air quality, total tourism revenue, and total number of tourists. These indicators are all positive, and the larger the value, the better the development level of rural tourism.

Table 1. Integrated development evaluation index system

System layer	Primary indicator	Secondary indicator	Direction
Hotel development	Supply scale	The number of hotels in the area	+
		Bed density	+
	Operating quality	Annual average occupancy rate	+
		Ota platform praise rate	+
	Industrial band motion	The number of people who travel in the civil war is more than	+
Rural tourism development	Resource base	The number of scenic spots above	+
		The number of recreational agriculture and rural tourism demonstration gardens	+
	Tourist supply	Star hotel number	+
		Number of tourist practitioners	+
	Tourist environment	Forest coverage	+
		The air is better than the number of days	+
	Tourism benefit	Travel revenue	+
		Total number of tourists	+

2.3. Research Methods

2.3.1. Entropy Method

In 1850, Clausius first proposed the entropy method to measure the degree of dispersion of indicators. Currently, the entropy method has become the most important method for determining the overall development level [19]. This article determines the information quantity of quantitative indicators to assess the degree of influence on the overall level. The specific steps are as follows:

The first step: Normalize each indicator. The specific method is:

$$x'_{ij} = \frac{x_j - x_{\min}}{x_{\max} - x_{\min}}; x'_{ij} = \frac{x_{\max} - x_j}{x_{\max} - x_{\min}} \tag{3}$$

Step 2: Calculate the information entropy value. The formula is:

$$e_j = -K \sum_{i=1}^{m} y_{ij} \ln y_{ij} \tag{4}$$

Among them, $y_{ij} = \frac{x'_{ij}}{\sum_{i=1}^{m} x'_{ij}} \left(0 \le y_{ij} \le 1\right)$ and K are constants, and $K = \frac{1}{\ln m}$.

Step 3: Determine the weight of the indicators. The weight of the j th indicator is:

$$w_j = \frac{d_j}{\sum_{j=1}^{m} d_j} \tag{5}$$

Step 4: Calculate the comprehensive evaluation value of the sample using the weighted summation formula. The formula is:

$$U = \sum_{i=1}^{n} y_{ij} \cdot w_j \times 100\% \tag{6}$$

Among them, U represents the comprehensive evaluation value; n is the number of indicators; w_j is the weight of the j th indicator. Clearly, the larger the U is, the better the sample performance is.

2.3.2. Coupling Coordination Degree Method

According to the physical capacity coupling coefficient model, drawing on the research foundation of relevant scholars [20], a coupling evaluation model for the two systems of homestay hotels and rural tourism development is constructed as follows:

$$C = \left\{ \frac{U_1 \times U_2}{\left[\left(U_1 + U_2\right)/2 \right]^2} \right\}^{1/2} \tag{7}$$

In formula (7), C represents the coupling degree of the two subsystems, while U_1 and U_2 respectively represent the comprehensive evaluation indices of the accommodation hotel and rural tourism development subsystems. The coordination degree C can reflect the strength of the interaction between the two subsystems, but it cannot explain the level of coordinated development of the two systems. Therefore, a coupling coordination degree model is constructed using the currently most commonly used principle of minimizing deviation as follows:

$$D = \sqrt{C \times T} \tag{8}$$

$$T = \alpha U_1 + \beta U_2 \tag{9}$$

Among them, D represents the coupling coordination degree, T represents the comprehensive coordination index of the homestay hotel and rural tourism development, α, β are undetermined coefficients, and $\alpha + \beta = 1$. Although the development of both the homestay hotel and rural tourism has promoted the regional economy, in recent years, the contribution to economic development has been higher. Based on the interview results of more than ten relevant experts, α, β are assigned values of

0.4 and 0.6 respectively. Referring to the existing research results, the classification of the coordination degree of the development of homestay hotels and rural tourism is shown in Table 2. The classification of the coupling coordination degree of homestay hotels and rural tourism is presented.

Table 2. The coupling coordination level is divided into standard

Serial	Degree of coordination	Coordination level	Serial	Degree of coordination	Coordination level
1	0~0.100	Extremely Imbalanced	6	0.501~0.600	Barely Coordinated
2	0.101~0.200	Severely Imbalanced	7	0.601~0.700	Primarily Coordinated
3	0.201~0.300	Moderately Imbalanced	8	0.701~0.800	Moderately Coordinated
4	0.301~0.400	Mildly Imbalanced	9	0.801~0.900	Well Coordinated
5	0.401~0.500	Marginally Imbalanced	10	0.901~1.000	Excellently Coordinated

2.3.3. Kernel Density Estimation

Kernel Density Estimation (KDE) is a method that examines the spatial variation of sample point density within the study area to study the distribution characteristics of the samples. The results can identify and represent the clustering and dispersion of the samples within the study region [21]. KDE is often used to visualize the spatial distribution and change characteristics of point data, reveal the local characteristics of geographical elements in space, and also reflect the degree of clustering and diffusion of the elements. This study mainly uses KDE to reflect the spatial density characteristics of the integration of homestay hotels and rural tourism, and the calculation formula is as follows.

$$f_n(x) = \frac{\sum_{i=1}^{n} k\left(\frac{x - x_i}{h}\right)}{nh} \tag{10}$$

In the formula: Let $x_1, \cdots, x_n$ be independent and identically distributed samples drawn from a population with distribution density function f. The value of f at a certain point x is estimated as $f_n(x)$; $k(\,)$ is the kernel function; h is the bandwidth; $x - x_i$ is the distance from the estimation point x to the sample x_i.

2.3.4. Geographical Detector Model

The geographical detector is a new statistical method used to detect the spatial heterogeneity of geographical elements and reveal the driving factors behind them [22]. This study utilized the geographical detector to extract the dominant factors for the integration of homestay hotels and rural tourism, and conducted quantitative analysis of the influencing factors. The model construction is as follows:

$$q = 1 - \frac{\sum_{i=1}^{k} n_i h_i^2}{nh^2} \tag{11}$$

In the formula, q represents the detection strength value of the influencing factors for the integrated spatial pattern of homestay hotels and rural tourism; n is the sample size; k is the number of categories of influencing factors; n_i, h_i^2 are the sample size and variance of the i-th layer respectively. The value range of q is $[0,1]$. The larger the q value, the greater the influence of the detection factor on the integrated spatial pattern of homestay hotels and rural tourism; conversely, the smaller the q value.

3. Empirical Results and Analysis

3.1. Analysis of Integrated Development Characteristics

3.1.1. Characteristics of the Development Level of Homestay Hotels and Rural Tourism

In order to more clearly express the overall evolution process of the coupling development of homestay hotels and rural tourism in Anhui Province, based on the calculation results, a trend chart of the comprehensive development level of homestay hotels and rural tourism in Anhui Province from 2010 to 2024 was drawn. The trend of the comprehensive development level of homestay hotels and rural tourism in Anhui Province is shown in Figure 1.

From the trend, it can be seen that the two industries in Anhui Province have generally shown a growth trend in the past fifteen years. The specific development characteristics are as follows:

(1) The growth rates and increments of the two industries are different. From the slopes of the evolution curves of the two industries, it can be seen that the growth rate of rural tourism is higher than that of the homestay hotel industry. After the outbreak of the COVID-19 pandemic, the comprehensive development levels of both the homestay hotel industry and rural tourism decreased. This is consistent with the actual development situation of the two industries.

(2) The stability of the development of the two industries is different. From 2010 to 2012, over the past thirteen years, the fluctuation range of the comprehensive development level of the rural tourism industry was smaller than that of the homestay hotel industry. The development status was relatively stable, mainly starting from 2015 as the dividing point, presenting two growth stages. From 2010 to 2015, it was the first leapfrog growth stage, and after 2015, although the growth rate decreased somewhat, the growth trend still persisted. While the comprehensive development level of the homestay hotel industry was somewhat volatile, it mainly started from 2016 as the dividing point. From 2010 to 2014, the homestay hotel industry showed a small fluctuation and growth. From 2015 to 2016, there was a rapid growth period, and it reached the first development peak in 2016. However, after 2016, the development showed a significant fluctuation, with the growth rate slowing down in 2016-2017, and reaching the trough point in 2018. In 2019, it began to rapidly recover. This round of development fluctuations was related to the macro development policies. In order to deeply implement the national policies, Anhui Province proposed to build a "culture-strong province" and accelerate the construction of a beautiful Anhui, and launched a series of measures to promote the development of the homestay hotel industry, thereby pushing the comprehensive development level of the homestay hotel industry to reach its peak in 2016. In recent years, Anhui Province has continuously promoted the structural transformation of the industry. This transformation has led to a slowdown in the growth rate of the comprehensive level of the homestay hotel industry from 2019 to 2019, and a new round of qualitative leap occurred in 2020.

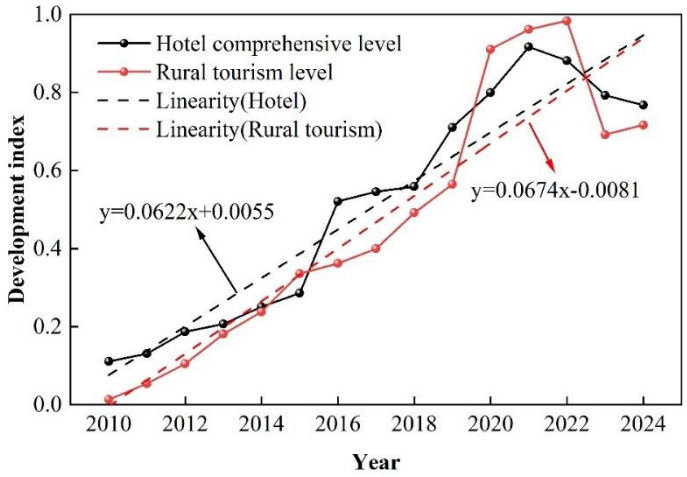

Figure 1. The trend of comprehensive development

3.1.2. Coupling and Coordination Degree of Cottage Hotels and Rural Tourism Development

Using the coupling coordination degree model, the comprehensive evaluation indices U1 and U2 for the development of homestay hotels and rural tourism in Anhui Province from 2010 to 2024, as well as the coupling coordination degree D between the two systems, were calculated. The development levels

of homestay hotels and rural tourism in Anhui Province and their coupling coordination degrees are shown in Table 3.

The coupling coordination levels of the two systems fluctuated from extremely coordinated, severely imbalanced, and moderately imbalanced in the period from 2010 to 2012, to barely coordinated in 2018 to 2019, to primary coordination in 2020 to 2022, and then to barely coordinated in 2023 to 2024. Overall, the coupling coordination status of the development of homestay hotels and rural tourism in Anhui Province from 2010 to 2024 can be divided into two stages:

The stage of continuously rising coupling coordination degree from 2010 to 2022, the stage of slightly decreasing and stable coupling coordination level from 2023 to 2024. From 2010 to 2014, U1 > U2, indicating that the rural tourism industry in Anhui lagged behind the development of the homestay hotel industry. The homestay hotel industry developed strongly in these years, and the comprehensive development level increased from 0.111 to 0.251. The rapid growth of the homestay hotel industry drove the development of related industries and provided a large number of accommodation conditions for rural tourism, promoting the development of rural tourism. The development speed of rural tourism was slower compared to the homestay hotel industry in this stage, but the comprehensive development level increased from 0.013 to 0.238, growing rapidly. It can be seen that from 2010 to 2014, both the homestay hotels and rural tourism industries developed rapidly, and the two systems mutually promoted and formed a virtuous cycle, with the coupling level continuously developing from extremely coordinated to mild imbalance. In 2015, U1 < U2, the coupling level was mild imbalance. From 2016 to 2019, U1 > U2, the coupling level reached the barely coordinated level, and from 2020 to 2022, U1 < U2, the coupling level reached the primary coordinated level.

From 2023 to 2024, U1 > U2, the development of the homestay hotel industry was relatively stable with a slight decline, and by 2024, U1 dropped to 0.768. The comprehensive development level of rural tourism decreased from 0.984 in 2022 to 0.689 in 2020, indicating that rural tourism was severely affected by the COVID-19 pandemic. From 2023 to 2024, the homestay hotels provided various forms of financial support for rural tourism, helping the tourism industry get out of the predicament. Therefore, the coordination degree of the two systems only decreased from the primary coordinated level in 2022 to the barely coordinated level.

Table 3. Hotel and country tourism development level and coupling coordination

Year	U1	U2	C	D	Coupling level
2010	0.111	0.013	0.188	0.099	Extremely Imbalanced
2011	0.131	0.054	0.413	0.187	Severely Imbalanced
2012	0.187	0.105	0.461	0.252	Moderately Imbalanced
2013	0.207	0.181	0.498	0.309	Mildly Imbalanced
2014	0.251	0.238	0.500	0.349	Mildly Imbalanced
2015	0.286	0.336	0.497	0.396	Mildly Imbalanced
2016	0.521	0.362	0.484	0.454	Marginally Imbalanced
2017	0.546	0.400	0.488	0.473	Marginally Imbalanced
2018	0.559	0.492	0.498	0.508	Barely Coordinated
2019	0.711	0.565	0.493	0.554	Barely Coordinated
2020	0.800	0.911	0.498	0.657	Primarily Coordinated
2021	0.917	0.962	0.500	0.687	Primarily Coordinated
2022	0.882	0.984	0.499	0.686	Primarily Coordinated
2023	0.793	0.692	0.498	0.594	Barely Coordinated
2024	0.768	0.689	0.499	0.597	Barely Coordinated

3.2. Analysis of the Spatiotemporal Evolution Characteristics of Integrated Development

3.2.1. Analysis of Spatial Evolution Characteristics of Integration Development Level

In order to more intuitively reflect the overall evolution characteristics of the regional differences in the integrated development of accommodation hotels and rural tourism in Anhui Province, the green development level data of Anhui Province in 2010, 2014, 2019, and 2024 were selected for kernel density analysis, and a Densi-Graph density histogram was drawn. The integrated development of accommodation hotels and rural tourism in Anhui Province is shown in Figure 2. In 2010, the kernel density curve presented a sharp "single peak" distribution feature, with a peak value higher than 0.1 and between 0.2, and the right tail value was between 0.3 and 0.4, indicating that the integrated development level of accommodation hotels and rural tourism in Anhui Province was at a relatively low level, and the

regional differences were not obvious. In 2014, the peak shape changed to a "broad peak", the center of the kernel density function shifted to the right, the height of the main peak decreased, indicating that the numerical value of the integrated development level of accommodation hotels and rural tourism in Anhui Province had increased, and the regional differences showed a discrete trend. In 2019, the center value of the kernel density slightly shifted to the right, the height of the main peak increased, the right tail phenomenon was obvious, and a second peak sign was shown, indicating that the overall development level of the integrated development of accommodation hotels and rural tourism in Anhui Province had improved in this stage, and the regional differences had further increased. In 2024, the kernel density curve presented a "M" type double peak distribution, the comprehensive index value of the first wave peak was close to 0.33, and the second wave peak gathered at approximately 0.52, the right tail phenomenon was more obvious, indicating that the regional differences in Anhui Province had decreased, and the number of cities with a higher integrated development level of accommodation hotels and rural tourism had increased. In general, from 2010 to 2024, each Densi-Graph histogram showed the continuous rightward movement of the right tail and the center value of the kernel density, the right tail dragging and the second peak gradually becoming significant, indicating that the development level of the integrated development of accommodation hotels and rural tourism in Anhui Province had continuously improved, there was a catching-up effect from low-level to high-level cities, and a "double peak" pattern gradually formed.

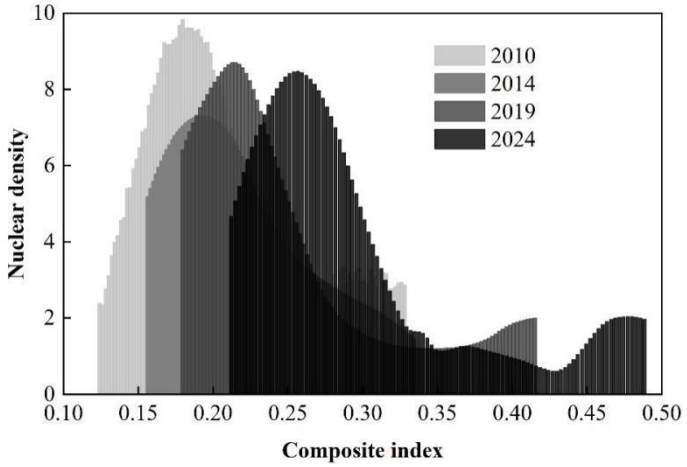

Figure 2. The horizontal nuclear density curve of Anhui province

3.2.2. Spatial Autocorrelation and Spillover Effects in Integrated Development

Next, the spatial statistical indicators are used to study the spatial autocorrelation of the integration and development of rural tourism and homestay hotels in Anhui Province. This paper adopts the widely used Moran Index [23]. The Moran Index is divided into the global Moran Index and the local Moran Index. Regarding the global Moran Index, a value greater than 0 indicates positive spatial correlation as a whole, and the closer it is to 1, the higher the similarity between units; a value less than 0 indicates negative spatial correlation, and the closer it is to -1, the greater the difference between units; a value close to 0 indicates no spatial correlation between units. For the local Moran Index, a positive value indicates that the region has similar aggregation characteristics with its adjacent regions, that is, low values are adjacent to low values, and high values are adjacent to high values; a negative value indicates that the region has opposite aggregation characteristics with its adjacent regions, that is, high values are adjacent to low values, and low values are adjacent to high values; the closer the value is to 0, the weaker the spatial correlation between the region and its adjacent regions.

The spatial weight matrix is defined using the proximity rule method, and the Moran Index and test results of the integration and development of rural tourism and homestay hotels in Anhui Province from 2015 to 2024 are calculated as shown in Table 4. At a significance level of 1%, all the Moran Index I values are greater than 0, indicating that the integration and development level of rural tourism and homestay hotels in Anhui Province shows a spatial dependence feature and is positively correlated. Since the p-values are all less than 0.01, it is indicated at a 1% significance level that the integration and development level of rural tourism and homestay hotels in Anhui Province has a strong positive spatial autocorrelation, reflecting the clustering phenomenon among the 16 cities in Anhui Province. Table 4 also shows that the global Moran Index I value is on an upward trend, indicating that the spatial positive correlation of the integration and development level of rural tourism and homestay hotels in Anhui

Province is continuously increasing, showing that the clustering of the integration and development of homestay hotels and rural tourism among the cities is constantly strengthening during this period.

Table 4. The Moran's I of the development level of the hotel and the country tourism

Year	Moran's I	E(I)	E(I)	z	p-value
2010	0.186	-0.069	0.101	2.559	0.001
2011	0.199	-0.069	0.109	2.613	0.001
2012	0.215	-0.069	0.111	2.666	0.001
2013	0.236	-0.069	0.113	2.817	0.001
2014	0.252	-0.069	0.114	2.899	0.001
2015	0.279	-0.069	0.120	2.925	0.002
2016	0.303	-0.069	0.126	2.997	0.001
2017	0.319	-0.069	0.129	3.037	0.001
2018	0.331	-0.069	0.132	3.060	0.001
2019	0.362	-0.069	0.140	3.112	0.001
2021	0.368	-0.069	0.145	3.045	0.001
2022	0.375	-0.069	0.145	3.095	0.001
2023	0.387	-0.069	0.146	3.174	0.001
2024	0.395	-0.069	0.146	3.222	0.001

3.3. Analysis of Influencing Factors of Integrated Development

Due to the differences in resource endowment, geographical conditions, and economic development levels among various regions, there will be a mismatch in the integration and development of homestay hotels and rural tourism, which hinders the two from achieving synchronous resonance and delays their coupled and coordinated development. The integrated and coordinated development of homestay hotels and rural tourism is not only supported by economic development levels but is also influenced by government policies and foreign investment, among other factors. Based on the actual development situation of each province (region) in ethnic areas and relevant expert opinions, and considering the availability of data, seven indicators, namely technological innovation (X1), regional openness (X2), industrial structure (X3), urbanization (X4), economic development level (X5), population quality (X6), and government regulation (X7), were selected as detection factors. Using the geographical detector method, the influence of each factor was quantitatively analyzed.

Due to the application of the geographical detector, the processing of categorical variables is superior to that of continuous data, and it also has the advantage of immune to collinearity of independent variables. Firstly, the $K-means$ method in SPSS 24.0 was used to cluster the detection factors, and they were divided into 1, 2, and 3 categories based on the actual situation. Then, through the geographical detector research method, the influence of each variable was calculated, and the specific results are shown in Table 5.

From 2023 to 2024, the average influence of technological innovation (X1), regional openness (X2), and economic development level (X5) was relatively high, and they were important factors affecting the integrated and coordinated changes of homestay hotels and rural tourism. The influence effects of industrial structure (X3) and urbanization (X4) on the coordination degree showed a weakening trend. The influence effects of technological innovation (X1), regional openness (X2), government regulation support for the tourism industry (X7), and economic development level (X5) were strengthening, and the influence of each factor on the coordination degree was heterogeneous in each year. In 2024, the influence of economic development level (X5), regional openness (X2), and technological innovation (X1) was the greatest, with values of 0.687, 0.666, and 0.609 respectively. The influence ranking of government regulation and population quality was the lowest, only 0.383 and 0.335 respectively. At this time, the regional development level (X2) and economic development level (X5) of the ethnic areas had improved compared to 2010, indicating that ethnic areas actively responded to the national policies on the construction of homestay hotels, rural revitalization, and rural tourism, actively introduced external funds, and fully utilized policy preferences, providing financial support and policy support for the development of rural tourism and homestay hotels, promoting the coordinated development of the two systems, and developing steadily while continuously improving the economy, optimizing the industrial structure, increasing research and development investment, improving the environmental atmosphere, and providing guarantees for the integrated and coordinated development of rural tourism and homestay hotels.

Table 5. The influence of various factors on the development of fusion

Year	X1	X2	X3	X4	X5	X6	X7
2010	0.192	0.225	0.231	0.115	0.116	0.209	0.103
2011	0.223	0.107	0.225	0.193	0.241	0.305	0.112
2012	0.252	0.162	0.248	0.240	0.169	0.331	0.126
2013	0.278	0.073	0.666	0.671	0.063	0.367	0.139
2014	0.543	0.501	0.428	0.131	0.732	0.441	0.290
2015	0.653	0.550	0.135	0.040	0.251	0.413	0.232
2016	0.388	0.452	0.149	0.196	0.328	0.488	0.287
2017	0.616	0.454	0.347	0.099	0.530	0.319	0.245
2018	0.638	0.656	0.025	0.024	0.597	0.524	0.206
2019	0.863	0.708	0.039	0.032	0.681	0.185	0.396
2020	0.762	0.762	0.139	0.102	0.575	0.181	0.231
2021	0.772	0.682	0.101	0.083	0.715	0.319	0.429
2022	0.875	0.421	0.448	0.130	0.628	0.183	0.338
2023	0.881	0.702	0.495	0.172	0.290	0.381	0.231
2024	0.609	0.666	0.386	0.390	0.687	0.335	0.383

4. Conclusion

Based on the research on the collaborative development of homestay hotels and rural tourism in Anhui Province using the comprehensive evaluation model and the coupling coordination degree measurement model, the following conclusions were drawn:

(1) Homestay hotels and rural tourism are highly compatible in terms of the service subjects and development goals. The construction of homestay hotels is the foundation for the improvement and efficiency enhancement of rural tourism, and rural tourism is an effective path for the construction of homestay hotels. Therefore, there is a good foundation for the coupling and coordinated development of the two.

(2) The coupling coordination level of the two systems has changed from extreme coordination, severe imbalance, and moderate imbalance from 2010 to 2012, to barely coordinated from 2018 to 2019, to primary coordination from 2020 to 2022, and to barely coordinated again from 2023 to 2024. The coupling coordination degree has continuously increased from 2010 to 2022, and then slightly decreased and stabilized from 2023 to 2024.

(3) The influence of various factors on the coordination degree of the rural tourism industry and the construction of homestay hotels is heterogeneous. By using the geographical detector research method, the influencing factors of the coordinated development of the two were analyzed. From the perspective of the influence of each factor over the years, the average influence of technological innovation, regional openness degree, and economic development level was the highest, and it had a significant impact on the changes in the coordination degree of the two.

The shortcomings of this paper are as follows: Due to the limitations of data acquisition, the construction of homestay hotels and the construction of the comprehensive evaluation index system of the rural tourism system need to be improved, and the selection of indicators requires further research and optimization. In addition, due to the relatively small time span, it cannot depict the long-term trend of the collaborative development of homestay hotels and rural tourism in Anhui Province, and thus cannot make better predictions and judgments for the future development of the two. This paper aims to serve as a stimulus, hoping that more attention and exploration will be paid to the development path of the coordinated development of homestay hotels and rural tourism under the background of rural revitalization in theory and practice.

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References

1. Feng, Z., Robinson, G. M., & Tan, Y. (2025). Rural revitalization in China: Reversing rural decline and eliminating poverty. Geography Compass, 19(7), e70039.
2. Guo, Y., & Li, S. (2024). A policy analysis of China's sustainable rural revitalization: integrating environmental, social and economic dimensions. Frontiers in Environmental Science, 12, 1436869.

3. Chen, X. (2020). The core of China's rural revitalization: Exerting the functions of rural area. China Agricultural Economic Review, 12(1), 1-13.
4. Yang, J., Yang, R., Chen, M. H., Su, C. H. J., Zhi, Y., & Xi, J. (2021). Effects of rural revitalization on rural tourism. Journal of Hospitality and Tourism Management, 47, 35-45.
5. Zhu, Y., Chai, S., Chen, J., & Phau, I. (2024). How was rural tourism developed in China? Examining the impact of China's evolving rural tourism policies. Environment, Development and Sustainability, 26(11), 28945-28969.
6. Bi, G., & Yang, Q. (2023). The spatial production of rural settlements as rural homestays in the context of rural revitalization: Evidence from a rural tourism experiment in a Chinese village. Land use policy, 128, 106600.
7. Anwar, A., Kumar, S., & Talukder, M. B. (2025). Sustainable rural development through homestay tourism: An evaluation of economics. Global practices and innovations in sustainable homestay tourism, 41-74.
8. Janjua, Z. U. A., Krishnapillai, G., & Rahman, M. (2021). A systematic literature review of rural homestays and sustainability in tourism. Sage Open, 11(2), 21582440211007117.
9. Li, Y., Xia, L., Wang, L., Qiu, M., & Utomo, S. (2024). How are rural homestays achieving sustainable development in the post-COVID-19 period: Value co-creation by operators, tourists, and government. Sustainability, 16(3), 1088.
10. Zheng, J., & Huang, L. (2022). Characterizing the spatiotemporal patterns and key determinants of homestay industry agglomeration in rural China using multi geospatial datasets. Sustainability, 14(12), 7242.
11. Long, F., Liu, J., Zhang, S., Yu, H., & Jiang, H. (2018). Development characteristics and evolution mechanism of homestay agglomeration in Mogan Mountain, China. Sustainability, 10(9), 2964.
12. Yuchen, J., & Xin, M. (2025). A Review of Research on Rural Homestays in China Based on CiteSpace. Journal of Landscape Research, 17(3), 81-88.
13. Wang, Z., Zhang, S., & Liu, W. (2025). When a villager is a rural homestay operator: role expectation research using the machine learning model?. Current Issues in Tourism, 28(6), 1002-1020.
14. Sianipar, R., Juliana, J., Hubner, I. B., Lemy, D. M., & Pramezwary, A. (2026). Empowering Local Communities Through Homestay Management: An Innovative Strategy for Sustainable Rural Tourism in Yogyakarta. Societies, 16(1), 34.
15. Sarma, N., Kumar, J., & Kumar, P. (2026). Service quality in homestay tourism: a homestay host perspective. Tourism Review, 81(4), 1226-1246.
16. Su, K., Wu, J., Yan, Y., Zhang, Z., & Yang, Q. (2022). The functional value evolution of rural homesteads in different types of villages: Evidence from a Chinese traditional agricultural village and homestay village. Land, 11(6), 903.
17. Chengcai, T. A. N. G., Zijie, Z. H. O. U., Ling, J. I. A. N. G., & Limei, L. I. U. (2024). Rural revitalization and high-quality development of culture and tourism: theoretical and empirical research. Journal of Resources and Ecology, 15(3), 521-527.
18. Feng, S. (2022). Research on the Development Strategy of Heyuan City's Homestay Industry under the Background of Rural Revitalization. Janjua, ZUA, Krishnapillai, G., & Rahman, M.(2021b). A Systematic Literature Review of Rural Homestays and Sustainability in Tourism. SAGE Open, 11(2), 215824402110071.
19. Qin Li, Zhenze Yang, Xingping Wu, Shuping Luo, Qiang Chen, Wenlong Li & Yijun Liu. (2025). Cultural-Ecological Health Assessment of Island Tourism Using a Pressure–State–Response Entropy Method: Evidence from Weishan Island, China. Land,14(11),2175-2175.
20. Hongtao Shen. (2024). Research on the Integration Mechanism of Cultural Industry and Tourism Industry Based on the Coupling Coordination Degree Model. Applied Mathematics and Nonlinear Sciences,9(1).

21. Yanyun Zhang & Yang Sun. (2024). Smart travel planning system based on kernel density estimation and similarity metric clustering algorithm. Evolutionary Intelligence,(prepublish),1-12.
22. Ruan Wenqi, Li Yongquan, Zhang Shuning & Liu Chih-Hsing. (2019). Evaluation and drive mechanism of tourism ecological security based on the DPSIR-DEA model. Tourism Management,75,609-625.
23. I R Dani, H Z Hadibasyir & N L Anggani. (2025). Analysis of the Spatial Transformation of Poverty and Education in Central Java, Indonesia Using Bivariate Moran's I in 2013 and 2023. IOP Conference Series: Earth and Environmental Science,1503(1),012006-012006.

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