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Research Article

Evaluation Model of Tourism-Driven Real Estate Economic Growth Point Based on AHP

Du Zheng

Jinhua Education College, Jinhua, Zhejiang 321000, China

Correspondence should be addressed to Du Zheng; 20050879@jhc.edu.cn

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The economy of real estate is intimately connected to people's quality of life, living standards, and living situations, all of which are extremely important in economic life. In order to better understand the impact of tourism-driven real estate on economic growth, based on AHP, this paper establishes an evaluation model of tourism-driven real estate economic growth. Based on the influencing factors of tourism real estate development, the evaluation model is built in this study of the tourism real estate development model by AHP and determines the optimal model according to the evaluation results. Through the application of the AHP model, the effect of real estate regulation policy is evaluated. The housing prices are affected not only by the influencing factors of housing prices in the pressure indicators, but also by real estate control policies. The model can effectively assess the economic growth point of real estate, propose real estate-specific guiding alternatives for economic growth and development, and ensure that the real estate market develops in a healthy and orderly manner.

1. Introduction

With the gradual development of tourism as China's national economy has reached a new high point, the forms of leisure consumption have become more and more abundant, and the consumption of the leisure economy in society has become more and more popular. The consumption economy has huge development potential, and the state is regulating it. The phenomenon of excessively high housing prices has continuously strengthened the control of the traditional real estate. The profit margins of real estate companies have become smaller and smaller. Real estate companies have continued to implement diversified development strategies. Many large real estate development companies have begun to develop tourism real estate. Transformation: tourism real estate has risen and gradually become a new investment hotspot [1]. The tourism real estate market in Europe and the United States has developed relatively mature, and China's tourism real estate economy has maintained a rapid growth momentum in recent years and has large market potential. The development of the tourism real estate industry has received more and more attention. It has also become a research hotspot in the real estate field [2]. Many tourism companies and real estate companies have begun to enter the ranks of tourism real estate development. Based on the advanced experience of foreign countries, they have successively developed some tourism real estate products with higher quality and more complete varieties.

Tourism and real estate are two closely associated industries in the realm of tourism real estate. The real estate industry provides important support for the development of the tourism industry. At the same time, the tourism industry also provides a broad market and huge market for the real estate industry. Expansion capacity: Tourism and real estate, in certain ways, have a larger added value in the tertiary sector. The rise of tourism real estate is the beginning of China's real estate industry to break the shackles of traditional models, open up new market space, and and acquirement. The result of greater development potential is also a product of the mature development of the country's tourism real estate industry [3]. Under the influence of the rapid growth of the global economy and environmental changes, tourism and real estate are combined to create a new industry called tourism and real estate. The emergence of this new format is the result of the interaction between the two parties. Tourism real estate takes tourism projects as the core, and as the object of its compound development, and connects the land to a new functional product business, including all projects or part of development projects, not only maintaining the function of the first residence, but also having the function of a second residence, with national infrastructure construction investment as its specific mode of operation [4].

The new economic growth point should have sufficiently strong market demand and a high economic growth rate, which can improve the quality of economic development, lead its development direction, and promote sustainable economic development [5]. The point of economic growth is essentially an internal stimulus factor in the economy. Its own development can spread and radiate outwards, which in turn will initiate the growth of the entire economy and finally adjust the structure of the economy under the effect of the spontaneous economic balance. At the new level of economic aggregates, balanced growth was achieved.

Scholars and experts made specific expressions on the connotation of abstract economic growth points. For example, Tao [6] defined economic growth points as all factors that can directly form economic growth and promote economic growth; he further proceeded from the two perspectives of tangible and intangible. A specific explanation: From a tangible point of view, economic growth points can be industries or sectors, enterprises, products, or regions; from an intangible point of view, economic growth points can be systems, technology, and so on. Amarasinghe et al. [7] defined the point of economic growth as, within a certain period of time, the rapid economic growth of certain (or several) industries or sectors of a country (region). The growth rate of the national economy plays a very important role in promoting, and these industries or sectors are the points of economic growth. Therefore, the definition of a new economic growth point is an economic growth point that has good development space and development potential but is still in the growth stage and is expected to bring a huge boost to economic growth.

The rearrangement and superposition of two significant hot spots in the tourism and real estate industries is known as tourism real estate. It also has certain advantages in policy support. On the one hand, it is based on tourism as a framework, specifically represented as resort hotels, etc., which is an important symbol of the reception capacity of tourist destinations; on the other hand, as a tourist attraction, such as Cannes, it is not only a residence but also a landscape component [8]. At the same time, it is also the main part of the living facilities in tourist destinations. It not only provides daily convenience facilities for local residents but also provides tourists with leisure services, such as commercial entertainment facilities. As a result, the growth of the tourism real estate business not only has a significant impact on local tourism and economic development, but also has a practical impact on the economic development of cities and towns. This stage is the top priority of the development of new economic growth points and the final link to determine the new economic growth points [9]. According to the selection stage, we have found the specific direction of the new economic growth point. Then it is necessary to conduct a comprehensive investigation and analysis of new economic growth points through the construction of new economic growth evaluation indicators and evaluation methods, so as to accurately and effectively find new economic growth points suitable for the current development of tourism real estate so that the economy has sustained development momentum.

The following is a breakdown of the research: The economic growth evaluation model based on AHP is examined in Section 2. The economic evaluation model is discussed in Section 3, and the empirical research is determined in Section 4. Finally, the research job is completed in Section 5.

2. Economic Growth Evaluation Model Based on AHP

Economic theory is used to develop essential fundamentals in a model of economic growth, to explain assumptions that allow proposing a relationship between the variables of production.

2.1. Score the Correlation Coefficient of the Evaluation Index

2.1.1. Fuzzy Membership Scoring of Positive Indicators. The larger the value of the positive index, the better the index of economic conditions, for example, per capita quasi-green GDP, per capita fiscal revenue, and other indicators.

Suppose x_{ki} is the score of the k^{th} index in the i^{th} evaluation year; V_{ki} is the value of the k^{th} index in the i^{th} evaluation year; n is the number of years in the evaluation year.

According to the positive index's scoring method [10], then x_{ki} is

$$x_{ki} = \frac{V_{ki} - \min\limits_{1\le i\le n}(V_{ki})}{\max\limits_{1\le i\le n}(V_{ki}) - \min\limits_{1\le i\le n}(V_{ki})}. \quad (1)$$

The relative distance between the deviation of the k^{th} index value from the minimum value and the deviation between the maximum value and the minimum value is the economic meaning of formula (3). The higher the value after normalization, the bigger the deviation, and the greater the distance.

2.1.2. Fuzzy Membership Scoring of Negative Indicators. The smaller the negative index value, the better the indicator of economic conditions, for example, residents' Engel coefficient, energy consumption per 10,000 yuan of GDP, and other indicators.

Suppose x_{ki} is the score of the k^{th} index in the i^{th} evaluation year; V_{ki} is the value of the k^{th} index in the i^{th} evaluation year; n is the number of years in the evaluation year.

According to the negative index's scoring method, x_{ki} is

$$x_{ki} = \frac{\max\limits_{1\le i\le n}(V_{ki}) - V_{ki}}{\max\limits_{1\le i\le n}(V_{ki}) - \min\limits_{1\le i\le n}(V_{ki})}. \quad (2)$$

Formula (2) has the same economic meaning as formula (1).

2.1.3. Fuzzy Membership Scoring of Moderate Index. A moderate index is an index that is closer to a certain prescribed value, which is the better. For example, if the growth rate of fixed-asset investment is too large, the economy will overheat, and too small will not be conducive to economic development, but the closer it is to the value set by the state's macrocontrol regulations, the better. By setting indicators such as the growth rate of fixed-asset investment as moderate indicators, the existing research simply believes that the larger the indicator value, the better, or the smaller the better [11]. Reasonably evaluate the economic development status.

Suppose x_{ki} is the k^{th} index score in the i^{th} evaluation year; q is the intermediate value of the k^{th} index; V_{ki} is the k^{th} index value in the i^{th} evaluation year. The scoring formula for the moderate index is as follows; x_{ki} is

$$x_{ki} = \begin{cases} 1 - \dfrac{q - V_{ki}}{\max\left(q - \min\limits_{1\le i\le n}(V_{ki}), \max\limits_{1\le i\le n}(V_{ki}) - q\right)}, & V_{ki} < q, \\ 1 - \dfrac{V_{ki} - q}{\max\left(q - \min\limits_{1\le i\le n}(V_{ki}), \max\limits_{1\le i\le n}(V_{ki}) - q\right)}, & V_{ki} > q, \\ 1, & V_{ki} = q. \end{cases} \quad (3)$$

Formula (3) has the same meaning as (1)

2.1.4. Fuzzy Membership Scoring of the Best Interval Index. The index value of the best interval index is a reasonable index in a certain interval. For example, the inflation rate index is ideal within [1%, 3%]. If it exceeds this range, it is either inflation or deflation.

By determining the optimal interval for economic development by indicators such as the inflation rate, it solves the shortcomings of unreasonable evaluation caused by the existing economic evaluations that the larger the better or the smaller the better.

Suppose x_{ki} is the k^{th} index score in the i^{th} evaluation year; V_{ki} is the k^{th} index value in the i^{th} evaluation year. n is the number of years in the evaluation year. The scoring method for the optimum interval index is as follows; x_{ki} is

$$x_{ki} = \begin{cases} 1 - \dfrac{q_1 - V_{ki}}{\max\left(q_1 - \min\limits_{1\le i\le n}(V_{ki}), \max\limits_{1\le i\le n}(V_{ki}) - q_2\right)}, & V_{ki} < q_1, \\ 1 - \dfrac{V_{ki} - q_2}{\max\left(q_1 - \min\limits_{1\le i\le n}(V_{ki}), \max\limits_{1\le i\le n}(V_{ki}) - q\right)}, & V_{ki} > q_2, \\ 1, & q_1 \le V_{ki} \le q_2. \end{cases} \quad (4)$$

In formula (4), q_1 and q_2, respectively, represent the left and right boundaries of the optimal interval of the index.

Formula (4) has the following economic meaning: the numerator is the difference between the k^{th} index value and the optimal value, and the denominator is the difference between the optimal value and the worst value. The difference between the proportions of the two deviations relative to 1 is the meaning of formula (4). The greater the value after normalization, the lower the variance and the smaller the distance.

2.1.5. Score the Index Correlation Coefficient Based on the Ideal Value. The overall principle for determining the ideal year index value is to take the best value of the index in each year to be evaluated as the ideal value of the index.

Suppose γ_{ki} is the correlation coefficient between the k^{th} index score of the i^{th} evaluated year and the ideal score. According to the correlation coefficient calculation formula, then

$$\gamma_{ki} = \frac{\min\limits_{1\le k\le m}\min\limits_{1\le i\le n}\left(|x_{k0} - x_{ki}|\right) + \xi \max\limits_{1\le k\le m}\max\limits_{1\le i\le n}\left(|x_{k0} - x_{ki}|\right)}{|x_{k0} - x_{ki}| + \xi \max\limits_{1\le k\le m}\max\limits_{1\le i\le n}\left(|x_{k0} - x_{ki}|\right)}. \quad (5)$$

In formula (5), x_{k0} is the result of calculating the ideal value of the k^{th} index; x_{ki} is the score of the k^{th} index in the i^{th} evaluated year; m is the number of economic evaluation indexes; n is the number of years in the evaluated year; $\xi \in [0, 1]$. In this paper, the value of ξ is 0.5 in accordance with international practice. In formula (5), $\min\limits_{1\le k\le m}\min\limits_{1\le i\le n}(|x_{k0} - x_{ki}|)$ and $\max\limits_{1\le k\le m}\max\limits_{1\le i\le n}(|x_{k0} - x_{ki}|)$ are the double minimum and maximum deviations between the scores of all indicators in all the years being evaluated and the ideal value; that is, the maximum and minimum deviations between each indicator value and the ideal value in all the years being evaluated are taken. The economic interpretation of formula (5) reveals that the ideal value of the index is treated as a reference point in space, while the actual value of the index is treated as a comparison point.

The distance between the reference point and the comparison point is represented by the correlation coefficient. The larger the correlation coefficient γ_{ki}, the greater the distance between points, and the higher the index value.

The correlation coefficients of all indicators in the evaluated year form the correlation coefficient matrix E of the evaluated year.

$$E = \begin{bmatrix} \gamma_{11} & \gamma_{12} & \cdots & \gamma_{1n} \\ \gamma_{21} & \gamma_{22} & \cdots & \gamma_{2n} \\ \vdots & \vdots & \cdots & \vdots \\ \gamma_{m1} & \gamma_{m2} & \cdots & \gamma_{mn} \end{bmatrix}. \quad (6)$$

2.2. Combination Weighting of Evaluation Indicators

2.2.1. The Method of Variation Coefficient to Find the Index Weight. Suppose μ_k is the weight of the k^{th} index obtained by the coefficient of variation method; m is the number of economic evaluation indicators; n is the number of years being evaluated. According to the formula for calculating the weight of the coefficient of variation, then:

$$\mu_k = \frac{\sqrt{\sum_{i=1}^{n} \left(V_{ki} - \overline{V}_k\right)^2 / n} / \overline{V}_k}{\sum_{k=1}^{m} \sqrt{\sum_{i=1}^{n} \left(V_{ki} - \overline{V}_k\right)^2 / n}}. \quad (7)$$

In formula (7), V_{ki} is the value of the k^{th} index in the i^{th} evaluation year; $\overline{V}_k$ is the average value of all the index values of the k^{th} index in the evaluation year.

2.2.2. AHP Method to Find the Weight of the Index

(A) The Weight of the Indicator Layer to the Criterion Layer. Use the 9-scale method to construct the judgment matrix, and use the eigenvector method to calculate the weight [12]. Then the weight v_k of the k^{th} index under each criterion layer

$$v_k = \frac{v_k'}{\sum_{i=1}^{M} v_k'}. \quad (8)$$

Among them, v_k is the weight of the k^{th} index under the criterion layer to the criterion layer; v_k' is the k^{th} eigenvector corresponding to the maximum eigenvalue of the judgment matrix; M is the number of indexes under the criterion layer.

Check the consistency of the results, and if the test passes, the weight distribution is reasonable. Otherwise, reconstruct the judgment matrix to find the weight.

(B) The Weight of the Indicator Layer to the Overall Target Layer. Suppose ρ_k is the weight of the k^{th} index to the overall goal under the j^{th} criterion level; v_k is the weight of the k^{th} index to the j^{th} criterion layer under the j^{th} criterion level: $v^{(j)}$ is the j^{th} criterion level to the total the weight of the goal $(j = 1, 2, \ldots, 6; k = 1, 2, \ldots, M)$.

According to the formula for calculating the weight of the indicator to the overall goal, then ρ_k:

$$\rho_k = v_k \times v^{(j)}. \quad (9)$$

2.2.3. Determination of Combination Weight. Suppose ω_k is the weight of the k index after the combination of the two weighting methods. ω_k is expressed as a linear combination of μ_k and v_k $(k = 1, 2, 3, \ldots, m)$, that is:

$$\omega_k = \alpha \times \mu_k + (1 - \alpha) \times \rho_k. \quad (10)$$

Among them, α is the ratio of the weight of the coefficient of variation to the weight of the combination: μ_k is the weight of the coefficient of variation of the k^{th} index; ρ_k is the AHP weight of the k^{th} index.

The objective function is to establish the objective function with the minimum sum of squares of the deviation between the combined weight and the subjective and objective weight as the goal; then:

$$\min z = \sum_{k=1}^{m} \left[\left(\omega_k - \mu_k\right)^2 + \left(\omega_k - \rho_k\right)^2 \right]. \quad (11)$$

Put formula (10) into formula (11)to obtain

$$\begin{aligned} \min z = \sum_{k=1}^{m} \Big[& \left(\alpha \times \mu_k + (1 - \alpha) \times \rho_k - \mu_k\right)^2 \\ & + \left(\alpha \times \mu_k + (1 - \alpha) \times \rho_k - \rho_k\right)^2 \Big]. \end{aligned} \quad (12)$$

Take the derivative of formula (12) with respect to α and setting the first derivative to zero, and solve equation $\alpha = 0.5$. Put $\alpha = 0.5$ into formula (10) to get ω_k:

$$\omega_k = 0.5\mu_k + 0.5\rho_k. \quad (13)$$

Let W be the weight vector composed of the weights of all indicators; then:

$$W = \left(\omega_1, \omega_2, \ldots, \omega_m\right). \quad (14)$$

The main difference between the combination weighting of formula (14) and the existing research on economic evaluation is that the combination weighting of formula (14) retains the true reflection of the actual situation and the future factors of objective weighting such as the coefficient of variation method. It infers and reflects the importance of the index attribute embodied by subjective empowerment such as AHP to the evaluation and the knowledge and experience of experts.

2.3. Evaluation Models. The correlation degree is calculated using the transposition W^T of the combination weight vector and the correlation coefficient matrix E, and the correlation degree R between the economy of each evaluated year and the economy of the ideal year is derived using the correlation degree calculation formula:

$$R = W^T \times E = \left(r_1, r_2, r_3, \ldots, r_n\right). \quad (15)$$

Formula (15) is an economic evaluation model based on combination weighting.

Sort by the degree of relevance $r_i\,(i = 1, 2, 3, \ldots, n)$ between the evaluated year and the ideal year. The evaluation of the economic status of each year determines the order of the degree of relevance.

3. Economic Evaluation Model

3.1. Model Framework Construction. To conduct evaluation research on real estate economic growth points, it is necessary to select a series of indicators to establish a rigorous and feasible evaluation system, clarify the relationship between economic growth and the real estate market, and judge the impact of macroeconomic control. By establishing a model, quantitative analysis, and establishing an evaluation system to accurately describe the relationship between real estate development and economic growth, the research problem can be easily solved. In this paper, AHP analytic hierarchy process builds an AHP model to study the development of real estate. The model building process is shown in Figure 1.

3.2. Data Standardization. The weight of the index has an important effect on the evaluation result. This paper chooses

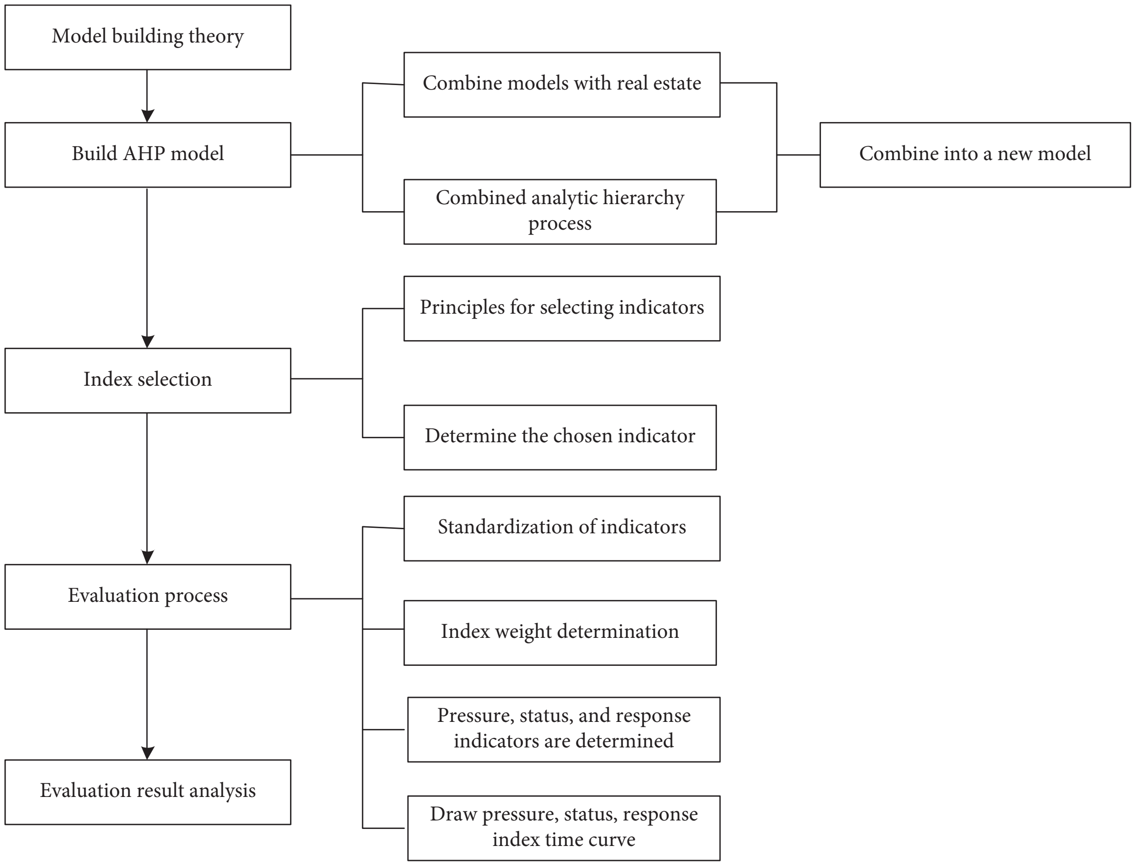

Figure 1: Model building process.

the best method to determine weight. After comprehensive comparison and selection, it is determined to use the analytic hierarchy process (AHP) to complete the weight determination. The analytic hierarchy approach decomposes decision-making factors into goals, criteria, plans, and other layers, which can then be used as a foundation for qualitative and quantitative analysis.

It simplifies and deconstructs complex issues into different constituent factors and then groups these constituent factors to form different hierarchical structures, determines the importance of each factor through a comparison method, and finally determines the weight coefficient of each factor [13]. The pressure-state-response index's baseline data includes dimensions and distribution space, and the differences in dimensions cannot be directly compared. Therefore, before determining the weight, a certain method must be used to eliminate the influence of the dimension and the order of magnitude on the results. It is to standardize the data.

When performing data standardization, the best value in the time point in the sequence is set to 1, and the ratio of other values to the best value or the reciprocal of the ratio is used as the normalized value. If the maximum value in the time point in the sequence is the best value, then the ratio of the residual value to the maximum value is used as the standardized value; if the minimum value at the time point in the sequence is the best value, the remaining value is the minimum value. The reciprocal of the ratio of the values is used as the normalized value [14]. The specific calculation steps are as follows:

(1) Construct a judgment matrix of N samples and M evaluation indicators, which is counted as $R = (X_{ij})_{n\times m}$.
(2) After the judgment matrix is standardized, the standardized judgment matrix B is obtained. The element expression in B is

$$P_{ij} = \frac{X_{ij} - X_j}{\partial_j}. \tag{16}$$

In formula (16), P_{ij} is the quantified value of the j^{th} index in the i^{th} period; X_{ij} is the original value of the j^{th} index in the i^{th} period; X_j is the arithmetic mean of the j^{th} index; ∂_j is the sample standard deviation.

3.3. Determine Weight Based on AHP. The technical route of the analytic hierarchy process is to divide the research question into multiple levels, and each level contains multiple indicators. According to the expert scoring method, the importance of multiple indicators at each level is determined by pairwise comparison, so as to determine fraction. Most of the scoring uses the 1–9 scale method, and then according to the eigenvector of the judgment matrix, the weight of each indicator to the upper indicator is determined. According to the questionnaire survey method, this paper collects the scores of 10 experts for the selected indicators and then calculates them according to the scoring table and obtains the index weight of each indicator layer by layer [15]. The calculation process is as follows:

The weight coefficient is the subjective judgment of the decision maker on multiple factors. Suppose n factors A_1, $A_2, \ldots, A_n$, whose weights are, respectively, $W_1, W_2, \ldots, W_n$, $W = (W_1, W_2, \ldots, W_n)^T$, compare these factors in pairs, and the weight ratios form a matrix:

$$A = \left(a_{ij}\right) - \begin{pmatrix} \frac{W_1}{W_1} & \frac{W_1}{W_2} & \cdots & \frac{W_1}{W_n} \\ \frac{W_2}{W_1} & \frac{W_2}{W_2} & \cdots & \frac{W_2}{W_n} \\ \frac{W_n}{W_1} & \frac{W_n}{W_2} & \cdots & \frac{W_n}{W_n} \end{pmatrix}. \quad (17)$$

For the above matrix A, its characteristics are as follows:

(1) $a_{ii} = 1$.

(2) $a_{ij} = 1/a_{ji}$.

(3) $a_{ij} = a_{ik}/a_{ik}$.

(4) Each column is proportional, and $AW = nW$.

Make pairwise comparisons according to the indicators of the scale table to obtain the judgment matrix A. The scale is shown in Table 1.

Table 1: Scale table.

Scaling A_{ij}	Definition
1	i and j are equally important
3	i is slightly more important than j
5	i is more important than j
7	i is much more important than j
9	i must be more important than j
2, 4, 6, 8	Between two adjacent importance levels
Reciprocal	i compared with j

3.4. Determine the Evaluation Index. The following formula can be used to compute the pressure index and state index for a specific time of the real estate control program:

$$E_i = \sum_{k=1}^{n} W_{ki} P_{ki}. \quad (18)$$

In formula (18), E_i represents the pressure or state index of the period, P_{ki} represents the weight of the k^{th} indicator in the period relative to the subsystem where it is located, and W_{ki} represents the quantitative value of the k^{th} indicator in the period.

When calculating the evaluation results, use the curve drawing function of EXCEL to draw a time line chart of pressure-state-response index in a coordinate system. From this time line chart, the connection and differences of the three curves can be clearly found, so as to study in the time line chart, specific research conclusions are obtained, and the evaluation of real estate economic growth points is completed.

4. Empirical Research

This paper takes T city as an example and studies the evaluation effect of real estate economic growth points through the changes in housing prices of tourism-driven real estate in T city. In the research process, in order to ensure the authenticity and accuracy of all data, the data in the paper comes from authoritative data websites, including the 2011–2020 National Bureau of Statistics website, the National Statistical Yearbook, the T City Statistical Yearbook, and the financial resources proposed by the People's Bank of China.

The paper uses the PSR-AHP model to conduct research, firstly using the analytic hierarchy process to determine the weight of each indicator in its indicator system. For two elements that are compared with each other, take one of the elements as 1, then compare with the previous layer, the two are of the same degree, and the other is also counted as 1. If the second element is better than the first element, then it is counted as 3; if the second is better than the first, it is counted as 5; if the second is significantly better than the first, it is counted as 7; if the second is much better than the first, it is counted as 9; 2, 4, 6, and 8 are between 1, 3, 5, 7, and 9. Compare the elements on a certain layer with all the lower-layer elements that are related to it one by one, and arrange each result in a row in turn; that is, the square matrix $A = (a_{ij})_{n\times n}$ is obtained, and the matrix is a pairwise comparison matrix.

The paper uses the expert scoring method to establish a pairwise comparison matrix of each indicator for the pressure layer and state layer with multiple indicators, calculate the weight of each indicator, and then conduct a consistency test (the consistency ratio C.I. < 0.1) and in turn get the weight of each index value of the pressure system and the state system.

Using the expert scoring method, select 10 experts to score each indicator, and summarize the scoring situation of each expert, calculate the average score, and use it as the expert scoring value of the indicator. The specific scores are shown in Tables 2–4.

According to the scores in the scoring table of the pressure indicators and state indicators given above, the YAAHP software is used to calculate the weight, and then the consistency check is performed to finally determine the weight W of each indicator. After consistency check, the value of the consistency check of the pressure index result C.I. is 0.0345, and the consistency check value of the state index result is 0.0180, both of which are less than 0.1, so it is determined that the weight W obtained by the application software is valid. The finally obtained pressure index weight coefficient and state index weight coefficient are shown in Table 3.

Table 2: Pressure index scoring table.

Stress index scoring	Urbanization rate	Infrastructure investment	Gross domestic product	Per capita income of urban and rural residents	Consumer price level	Land price
Urbanization rate	1	1/3	1/2	1/3	1/7	1/4
Infrastructure investment	2	1	2	1/3	1/6	1/5
Gross domestic product	2	1/3	1	1/4	1/5	1/4
Per capita income of urban and rural residents	8	5	6	2	1/2	1/3
Consumer price level	9	2	3	2	4	1
Land price	5	3	4	3	1/2	2

Table 3: Weight values of pressure indicators.

Stress index scoring	Urbanization rate	Infrastructure investment	Gross domestic product	Per capita income of urban and rural residents	Consumer price level	Land price
Weights	0.0241	0.0481	0.0916	0.0914	0.2076	0.1468

Table 4: State indicator weight value.

Status indicator scoring	Land supply	Real estate related taxes	Deposit reserve ratio	Rediscount rate	Real estate loan interest rate
Weights	0.2010	0.1781	0.1916	0.1914	0.2076

After processing all data dimensionless, according to the weight of the pressure index and the state index, the data of each month are summarized, and the pressure and state index of the real estate regulation policy of T city from January 2011 to December 2020 is obtained through calculation. The response index is determined according to the processed value of the Tianjin housing sales price index. Among them, the pressure, state, and response indexes of some values from 2011 to 2020 are shown in Table 5.

With different years' pressure indexes, state indexes, and reaction indexes, three curves are drawn, and the changing trend and mutual influence of different indexes can be clearly seen. The three curves in Figures 2–4 reflect the changes of the pressure index, state index, and response index. Among them, the pressure index comprehensively reflects the eight factors that affect house prices. When the pressure index increases, it indicates that the various factors affecting house prices increase. When the pressure index decreases, it indicates that the various factors affecting house prices weaken. The state index reflects the real estate control policy. It is a response to the intensity of the real estate control policy. When the state index increases, it indicates that the state has increased its control over real estate and controls the rise in housing prices; when the state index decreases, it indicates that the state has the reduction in regulation and control has promoted the rise in housing prices. The response index directly reflects the level of housing prices, an increase in the response index indicates an increase in housing prices, and a decrease in the response index indicates a decrease in housing prices.

The range of changes in housing prices is bigger than the range of changes in the pressure index and the state index, as shown in Figures 2–4. This also demonstrates that regulatory measures, as well as stress factors, influence the rise and fall

Table 5: Value table of part of the pressure, state, and response index of City T from 2011 to 2020.

Year	Stress index	State index	Response index
2011	0.00787	0.0238	0.0482
2012	0.01629	0.1032	0.1309
2013	0.0309	0.1843	0.23708
2014	0.05056	0.03596	0.39213
2015	0.0809	0.11067	0.67303
2016	0.16292	0.25843	0.31067
2017	0.24382	0.46292	0.05787
2018	0.39382	0.94494	0.54438
2019	0.60056	0.4028	0.64101
2020	0.77865	0.68427	0.7573

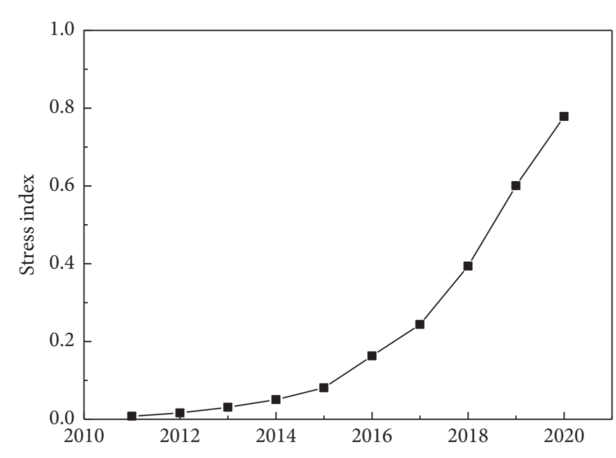

Figure 2: Diagram of pressure index change.

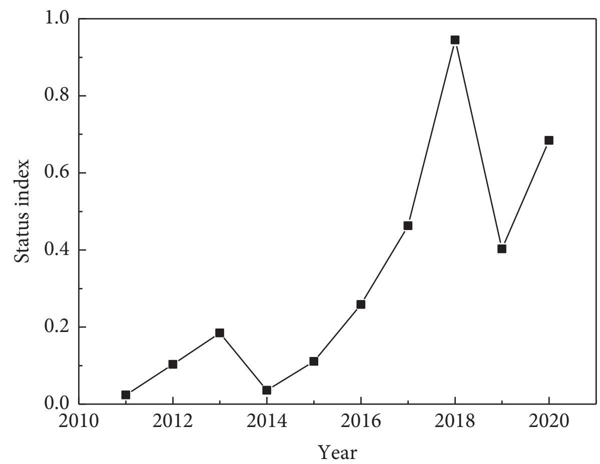

Figure 3: Diagram of state index changes.

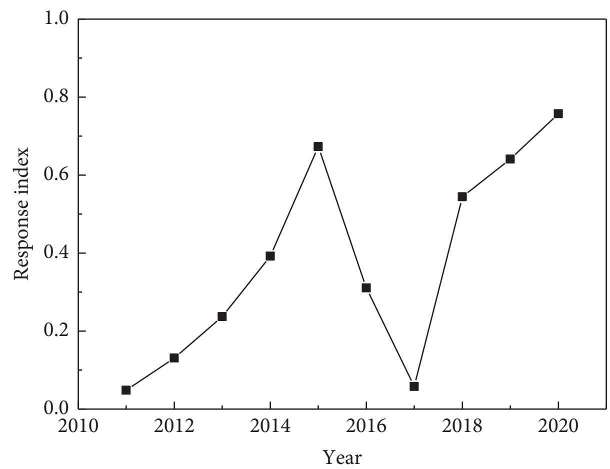

Figure 4: Change of response index.

of property prices. Because the reaction index is the consequence of the interaction between the pressure index and the state index, it has a wider change range than the pressure index and the state index.

The state index and response index are asynchronous in their changes. When the response index value is the largest, the state index does not reach the maximum but reaches the maximum at a later time. Similarly, when the response index reaches the minimum, the state index also reaches the minimum at a later time. Therefore, it can be seen that the response time of the state index is later than the response index; that is, the state index has a hysteresis.

5. Conclusion

Based on AHP, an evaluation model of tourism-driven real estate economic growth points is established. The model is a system constructed with three indicators of pressure-state-response, which can explain the relationship between various factors that affect housing price changes, real estate, and economic growth. In the model, the pressure, state, and response index are quantified, and the impact of real estate on economic growth can be clearly obtained. Through research, it is found that housing prices are affected not only by the influencing factors of housing prices in the pressure indicators, but also by real estate control policies. The changing trends of the three are basically the same, indicating that the relationship between pressure and status in the PSR-AHP model is positively correlated, and real estate and economic growth have a promoting effect. Through this model, it is possible to effectively predict the changes in housing prices, as well as to formulate real estate control policies, so as to promote the country's economic growth and ensure the healthy and orderly development of the real estate market.

Data Availability

The data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares that he has no conflicts of interest.

References

[1] L. Cheng and J. Zhang, "Assessment of coupling coordination between tourism development and economic growth after the 2008 Wenchuan earthquake: Beichuan, China," *Asia Pacific Journal of Tourism Research*, vol. 25, no. 6, pp. 602–619, 2020.

[2] J. Yan, D. Zhang, and F. Xia, "Evaluation of village land use planning risks in green concepts: the case of Qiwangfen village in Beijing," *Land Use Policy*, vol. 104, Article ID 105386, 2021.

[3] A. Lak, M. Gheitasi, and D. J. Timothy, "Urban regeneration through heritage tourism: cultural policies and strategic management," *Journal of Tourism and Cultural Change*, vol. 18, no. 4, pp. 386–403, 2020.

[4] S. Marques Pereira, "Regulation of short-term rentals in Lisbon: strike a balance between tourism dependence and urban life," *Urban Research & Practice*, vol. 44, pp. 1–28, 2020.

[5] Y. Deng, W. Qi, B. Fu, and K. Wang, "Geographical transformations of urban sprawl: e," *Cities*, vol. 105, Article ID 102415, 2020.

[6] H. Tao, J. M. Liu, Y. Deng, and A. Du, "Tourism sectorization opportunity spectrum model and space partition of tourism urbanization area: a case of the Mayangxi ecotourism area, Fujian province, China," *Journal of Mountain Science*, vol. 14, no. 3, pp. 595–608, 2017.

[7] H. K. Amarasinghe and D. Silva, "An investigation of tourism investment on accommodation sector of tourism industry of Sri Lanka," *Sustainable Tourism Development*, pp. 265–292, Apple Academic Press, New York, NY, USA, 2019.

[8] S. Dai, H. Xu, and F. Chen, "A hierarchical measurement model of perceived resilience of urban tourism destination," *Social Indicators Research*, vol. 145, no. 2, pp. 777–804, 2019.

[9] A. Darko, A. P. C. Chan, E. E. Ameyaw, E. K. Owusu, E. Pärn, and D. J. Edwards, "Review of application of analytic hierarchy process (AHP) in construction," *International journal of construction management*, vol. 19, no. 5, pp. 436–452, 2019.

[10] D. Pamučar, Ž. Stević, and E. K. Zavadskas, "Integration of interval rough AHP and interval rough MABAC methods for evaluating university web pages," *Applied Soft Computing*, vol. 67, pp. 141–163, 2018.

[11] M. Yucesan and G. Kahraman, "Risk evaluation and prevention in hydropower plant operations: a model based on Pythagorean fuzzy AHP," *Energy Policy*, vol. 126, pp. 343–351, 2019.

[12] Z. Li, Z. Fan, and S. Shen, "Urban green space suitability evaluation based on the AHP-CV combined weight method: a case study of Fuping county, China," *Sustainability*, vol. 10, no. 8, p. 2656, 2018.

[13] P. Chatterjee and S. Ž, "A two-phase fuzzy AHP-fuzzy TOPSIS model for supplier evaluation in manufacturing environment," *Operational Research in Engineering Sciences: Theory and Applications*, vol. 2, no. 1, pp. 72–90, 2019.

[14] F. Ecer, "An integrated Fuzzy AHP and ARAS model to evaluate mobile banking services," *Technological and Economic Development of Economy*, vol. 24, no. 2, pp. 670–695, 2017.

[15] K. Duan, J. Zuo, X. Zhao, and D. Tang, "Integrated sustainability assessment of public rental housing community based on a hybrid method of AHP-entropy weight and cloud model," *Sustainability*, vol. 9, no. 4, p. 603, 2017.