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Spatio-Temporal Evolution and Influencing Factors of High Quality Development in the Yunnan–Guizhou, Region Based on the Perspective of a Beautiful China and SDGs

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Abstract: The high-quality development in the Yunnan–Guizhou region (YGR) is a significant support for the high-quality development of China. It will help shape a new pattern of regional coordinated development. Referring to a Beautiful China and the United Nations Sustainable Development Goals (SDGs) evaluation indexes, we built an evaluation index system that puts the high-quality development at its heart. This system includes the resource load, economic development, ecological environment protection, and social progress. Taking 25 prefecture-level cities of the YGR as study subjects, the authors used the entropy weight–TOPSIS model to evaluate high-quality development and evolution. Then, the authors used the Geographical Detector (GD) method and a Geographic-Weighted Regression (GWR) model to analyze factors and mechanisms of the evolution of high-quality development. The results suggest that the changes of urban built-up area, per capita GDP, total foreign trade value, tourism revenue, and total investment of fixed assets investment are the primary factors of spatial differentiation of this evolution. The influence and direction of each factor are different in different periods, with apparent spatio-temporal heterogeneity. From 2005 to 2018, the synergistic effect of changes in total foreign trade value and tourism revenue is the leading force in shaping the evolution pattern. The high-quality development of the YGR generally presents the spatial pattern of "central Yunnan–central Guizhou core dual drive", "high in east and low in west", and the evolution speed presents a development characteristic of "low speed–relatively high speed–high speed". The research can provide a reference for high-quality and precise development and decision-making in the YGR.

Keywords: Yunnan–Guizhou region; high-quality development; index system; time–spatial evolution; geographical detector; geographic-weighted regression

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1. Introduction

The important strategic thought of "Building a Beautiful China" was proposed for the first time in the report of the 18th CPC National Congress, and the building of a beautiful China was regarded as a strategic measure for the reform and innovation of an ecological civilization system [1]. Beautiful China refers to the realization of the sustainable development goals of the effective protection of the ecological environment, sustainable utilization of natural resources, green economic and social development, and harmonious coexistence between man and nature within a specific period of time, so as to form a strong country with sustainable development [2]. In September 2015, the United Nations proposed the 2030 Sustainable Development Goals (SDGs), and set the Human Social Development Goals from 2015 to 2030. The 19th National People's Congress of China has made a major strategic judgment that China's economy has shifted from a stage of rapid high-speed growth to a stage of high-quality development [3]. The goal of building a Beautiful China is mainly consistent with the connotation of SDGs, covering five dimensions including fresh air, clean water, soil safety, good ecology, and clean living. It can be seen that building a Beautiful China consists of realizing the localization of SDGs, and provides a model for the global sustainable development. The high-quality development is more abundant, which is the combination of quantity expansion and quality improvement, with distinct characteristics of the times [4]. When compared with building a Beautiful China and developing sustainable development, high-quality development is a more profound and strategic development strategy in the new era. It can be deduced that building a Beautiful China and sustainable development is the foundation and prerequisite for high-quality development, while high-quality development is the fundamental path for building a Beautiful China and for achieving sustainable development. In the context of high-quality development, this paper puts more emphasis on "quality" and "efficiency" within the field [5]. Therefore, the transition from "Beautiful China" to "sustainable development", and then to "high-quality development", not only reflects the continuity of the central government's policies, but also fully reflects the deepening understanding of the development [6].

Since the construction goal of high-quality development officially rose to the national strategic level in 2017, the Communist Party of China and the country have performed fruitful practices on the mode and path of high-quality development. Arguments regarding this high-quality development have also been a hot topic in the academic circles [7–10]. The high-quality development focuses on the development of efficiency and innovation-driven processes. It emphasizes the maximization of environmental, economic, and social benefits in the development process, so as to coordinate the optimal development of a three-dimensional system of the economic system, environmental system, and social system. On the one hand, researchers pay attention to the evaluation indicators of high-quality development. From multiple perspectives in economy, society, politics, culture, ecology, and other fields [4,11], the five development concepts of "innovation, coordination, green, openness and sharing" are considered as being pilots for high-quality development [12,13]. On the other hand, the realization path of high-quality development is discussed, including the river basin [14], urban agglomeration [15], and the county scale [16]. For instance, at the watershed scale, Li Xiaojian et al. [17] studied the high-quality development of the Yellow River basin from the perspective of human–land coordination. On the scale of urban agglomeration, Luo Zhanfu et al. [18] analyzed the coupling state of high-quality development and ecological environment of Lanzhou–Western urban agglomeration based on the concept of the ecological city. At the county scale, Hua Xiangyu et al. [8] selected the counties in Zhejiang province as the object of study to measure the coupling and coordination level of high-quality development.

Throughout the academic studies on high-quality development in the academic circle, although a series of fruitful results achievements have been made, there are some deficiencies. The details are as follows. 1. The high-quality development is relatively fragmented and one-sided, and lacks the application and thinking about Beautiful China and SDGs, as well as the continuity of macro policy background and the status quo of social development. 2. The high-quality development evaluation index system is short in scientific rigor and pertinence. Due to the unclear understanding of the connotation of high-quality development, or without considering the regional particularity, the constructed high-quality development evaluation index system cannot reflect the actual regional development situation. 3. The research on high-quality development in the southwest interior is ignored. The YGR is characterized by significant spatio-temporal heterogeneity and typical representativeness, so that enough attention should be paid to the high-quality development in it. Therefore, building a high-quality development evaluation system on the basis of a Beautiful China and SDGs cannot only improve the credibility of the index system, but also must closely connect with the construction of an ecological civilization, helping the ecological civilization to lead to high-quality development.

With the deepening of reforming and opening up, the deepening of opening-up in the country is an efficient approach to promote the domestic and international double cycle with high quality [9]. The eastern and central regions have gradually entered the right track of high-quality development; for inland southwest China, there is a certain distance from high-quality development. High-quality development is the only way for the development of the YGR. It should accelerate the high-quality development, which is not only a favorable support for the high-quality development of the whole country, but also will promote a new pattern of coordinated regional development. In the newly announced outline of the 14th Five-Year Plan, both Yunnan and Guizhou provinces proposed to actively integrate themselves into the overall situation of national development, clarify the priorities of government work, and promote high-quality development [19,20].

According to the connotation and requirements of Beautiful China and sustainable development, 36 indicators are selected from four systems of "resource–economy–environment–society" in order to evaluate the high-quality development of the YGR. This study mainly solves the following problems: 1. What is the high-quality development level of YGR? 2. What are the characteristics of its spatio-temporal evolution? 3. What are the factors affecting the high-quality development (evolution)? This paper evaluated the high-quality development of YGR from the perspective of Beautiful China and SDGs, in order to provide a scientific reference for the high-quality and accurate development in the YGR.

2. Study Area and Data

2.1. Study Area

2.1.1. Study Small Areas

This paper considers the YGR (cf. Figure 1) as the area of study, which is located in the southwest China. It is an important node in the center of the "cross framework" of the Maritime Silk Road. It connects the Pacific Ocean and the Indian Ocean from east to west and the Chongqing–Xinjiang–Europe from north to south. It also connects the Yangtze River Economic Belt and the Pearl River Economic Circle, with superior geographical conditions. The Yunnan–Guizhou area is also the place where many big rivers flow, such as the Lancang–Mekong River and Pearl River, and it is rich in hydropower and mineral resources [21,22]. In recent years, the YGR has actively adjusted its industrial structure. It has gradually become the cornerstone of high-quality development in southwest China.

2.1.2. Data Source

The study subjects considered in this paper were 25 cities in YGR, with time scales of 2005, 2010, 2015, and 2018. The social and economic data are from the Yunnan Statistical Yearbook [23], Guizhou Statistical Yearbook [24], Chinese Urban Statistical Bulletin [25], statistical bulletins of national economic and social development of prefecture-level cities and autonomous prefectures, government statistical bulletins [26–29], and scientific and technological statistical bulletins. The environmental data come from the Yunnan Environment Bulletin and Guizhou Environmental Bulletin. The water resource data are provided by the Yunnan Water Resources Bulletin and Guizhou Water Resources Bulletin. Some of the missing data are complemented by interpolation.

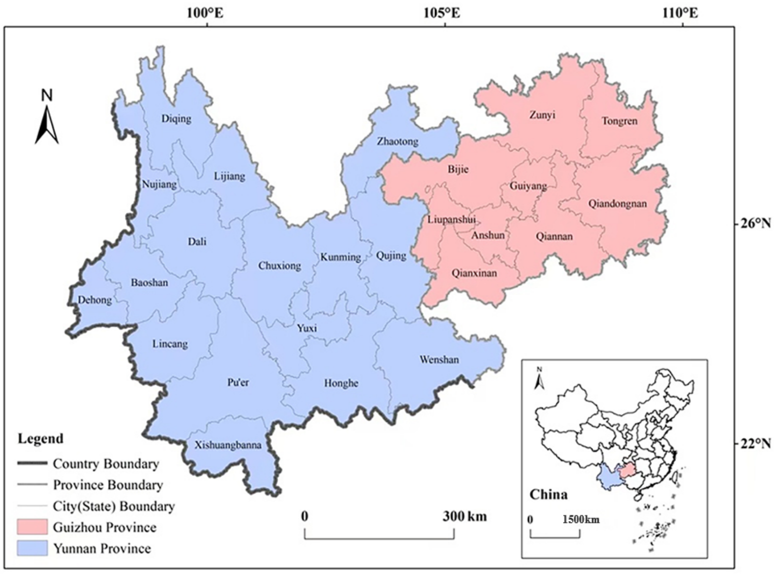

Figure 1. The Research Area of YGR. Note: The map is based on the standard map of GS (2020) 4619, downloaded from the standard map service website of the Ministry of Natural Resources. The base map is not modified, the same below.

3. Research Method

3.1. Evolution Logic of Beautiful China, SDGs, and High-Quality Development

The evolutionary logic of Beautiful China, SDGs, and high-quality development is illustrated in Figure 2.

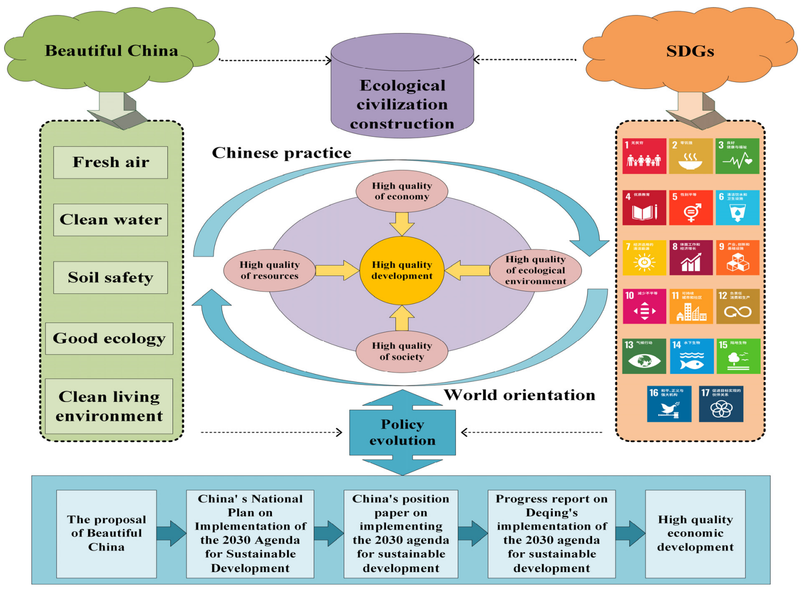

Figure 2. Evolution map of Beautiful China, SDGs, and high-quality development. 1 No Poverty; 2 Zero Hunger; 3 Good Health and Well-being; 4 Quality Education; 5 Gender Equality; 6 Clean Water and Sanitation; 7 Affordable and Clean Energy; 8 Decent Work and Economic Growth; 9 Industry, Innovation and Infrastructure; 10 Reduced Inequality; 11 Sustainable Cities and Communities; 12 Responsible Consumption and Production; 13 Climate Action; 14 Life Below Water; 15 Life on Land; 16 Peace and Justice Strong Institutions; 17 Partnerships to achieve the Goal.

3.2. Construction of the Index System

Building a scientific evaluation index system is a crucial basis and standard for evaluating the high-quality development level. The reliability of the evaluation results depends on the scientific rigor of the index system [30]. However, in different areas, the connotation of high-quality development has both similarities and characteristics. Therefore, this paper is based on the regional characteristics of YGR, referring to "the Evaluation Index System and Implementation Plan for the Construction of a Beautiful China", issued by the National Development and Reform Commission, as well as SDGs, and the existing Beautiful China and sustainable development index system. We then combined this data with the "14th Five-Year Plan" of the Yunnan and Guizhou provinces, and focused on "high-quality resources, high-quality economy, high-quality ecological environment and high-quality society" [19,20]. Finally, a composite evaluation index system of "resources–economy–environment–society" was developed (cf. Table 1).

Table 1. Evaluation index system for high-quality development in YGR based on Beautiful China and SDGs.

Standard Floor	Elements Layer	Indicator Layer	Corresponding to the Beautiful China/Sustainable Development Evaluation System	Corresponding to the SDG Index	Class	Class	Weight
Resource load	Water resources utilization	Per capita water consumption/m^3	Peak et al. [31]	/	select	-	0.0070
		Water consumption per unit of GDP/(m^3·Wan Yuan^{-1})	Zhu Jing et al. [32]; Wang Tao et al. [33]	6.4.1	select	-	0.0046
		Water consumption per unit of industrial added value/(m^3·Wan Yuan^{-1})	Zhu Jing et al. [32]	6.4.1	select	-	0.0032
	The sources of energy consume	Energy consumption per unit of GDP ^{ab}/(tce·Wan Yuan^{-1})	Fang Chuanglin et al. [34]; Zhu Jing et al. [32]; Wang Tao et al. [33]	/	select	-	0.0044
		Unit GDP power consumption/(kW h ten thousand yuan^{-1})	Fang Chuanglin et al. [34]	/	select	-	0.0096
		Energy consumption per unit of industrial added value/(tce ten thousand yuan^{-1})	/	/	continue	-	0.0026
	Land develop	Grain planting area/ten million ha	/	2.4.1	improve	+	0.0391
		highway mileage/km	Xie Binggeng et al. [35]	/	select	+	0.0241
		Urban built-up area of/km^2	/	/	continue	+	0.0629

Table 1. *Cont.*

Standard Floor	Elements Layer	Indicator Layer	Corresponding to the Beautiful China/Sustainable Development Evaluation System	Corresponding to the SDG Index	Class	Class	Weight
Economy develop	Economy actual strength	per capita GDP [ab]/first	Fang Chuanglin et al. [34]; Xie Binggeng et al. [35]; Zhu Jing et al. [32]	8.1.1	select	+	0.0458
		GDP annual growth rate/%	Zhu Jing et al. [32]	8.1.1	select	+	0.0143
		Industrial value added accounted for GDP [a]/%	Xie Binggeng et al. [35]	/	select	+	0.0233
	Economy latent capacity	Science and technology expenditure accounts for/% of local fiscal expenditure	Fang Chuanglin et al. [34]; Wang Tao et al. [36]	1.a.2	select	+	0.0485
		The expenditure on education accounts for/% of the local fiscal expenditure	Fang Chuanglin et al. [34]	1.a.2	select	+	0.0104
		R & D input strength [ab]/%	Zhu Jing et al. [32]; Wang Tao et al. [33]	9.5.1	select	+	0.0550
	Economy vigor	Total foreign trade import and export volume [ab]/billions of dollars	/	/	select		0.1730
		Tourism income [b]/100 million	/	8.9.1	improve	+	0.0982
		gross fixed asset formation [b]/100 million	Xie Binggeng et al. [35]	/	select	+	0.0765
Organism's habits environment protect	Environment foundation	land area covered with trees [ab]/%	√ Peak et al. [31]; Wang Tao et al. [33]	15.1.1	select	+	0.0084
		Green coverage rate of the built-up area/%	Zhu Jing et al. [32]; Wang Tao et al. [33]	/	select	+	0.0117
		Good air quality rate [ab]/%	√ Fang Chuanglin et al. [34]; Gao Feng et al. [31]; Wang Tao et al. [33]	/	select	+	0.0061
	Environment pollute	Industrial sulfur dioxide emissions/t	Peak et al. [31]; Zhu Jing et al. [32]	/	select	-	0.0074
		Industrial wastewater discharge/million t	/	6.3.1	improve	-	0.0045
		Agricultural chemical fertilizer application amount/t	√ Peak et al. [31]	/	select	-	0.0059
	Environment administer	Urban domestic sewage treatment rate/%	√ Fang Chuanglin et al. [34]; Wang Tao et al. [33]	6.3.1	select	+	0.0197
		Comprehensive utilization rate of industrial solid waste/%	Peak et al. [31]	11.6.1	select	+	0.0153
		Non-harmless treatment rate of urban household garbage/%	√ Fang Chuanglin et al. [34]; Wang Tao et al. [33]	/	select	+	0.0149

Table 1. *Cont.*

Standard Floor	Elements Layer	Indicator Layer	Corresponding to the Beautiful China/Sustainable Development Evaluation System	Corresponding to the SDG Index	Class	Class	Weight
Society progress	Society harmonious	Urbanization rate [ab]/%	Fang Chuanglin et al. [34]; Xie Binggeng et al. [35]; Zhu Jing et al. [32]	/	select	+	0.0210
		Urban-rural disposable income ratio [b]	Fang Chuanglin et al. [34]; Zhu Jing et al. [32]; Wang Tao et al. [33]	/	select	-	0.0067
		The number of deaths in various production safety accidents [b]/human being	Zhu Jing et al. [32]; Wang Tao et al. [33]	8.8.1	select	-	0.0092
	The people's livelihood ensure	Registered urban unemployment rate [ab]/%	Zhu Jing et al. [32]; Wang Tao et al. [33]	8.5.2	select	-	0.0082
		Urban worker basic endowment insurance participation rate [b]/%	/	1.3.1	improve	+	0.0487
		per capita output of grain [ab]/kg	Zhu Jing et al. [32]	2.3.1	select	+	0.0119
	Public serve promote	Ten thousand people have the number of health technicians/person	Fang Chuanglin et al. [34]; Xie Binggeng et al. [35]; Zhu Jing et al. [32]	3.c.1	select	+	0.0261
		Ten thousand people have a middle school number/person	Fang Chuanglin et al. [34]	4.1.2	improve	+	0.0158
		Internet penetration rate/%	Fang Chuanglin et al. [34]; Zhu Jing et al. [32]	9.c.1	select	+	0.0560

"√" indicates that the indicators come from the Evaluation Index System and Implementation Plan for the Construction of a Beautiful China issued by the National Development and Reform Commission. "[a]" indicates that the indicators come from the "14th Five-Year Plan" of Yunnan Province. "[b]" indicates that the indicators come from the "14th Five-Year Plan" of Guizhou Province, which were collated by the author.

3.3. The Entropy Weight–TOPSIS Model

The entropy weight method can efficiently reflect the role of the index in the evaluation object [37]. The TOPSIS method is one of the evaluation methods based on multi-objective decision-making. It identifies the positive and negative ideal solutions of each index in the target, and measures the distance between the index and the positive and negative ideal solutions, namely the closeness degree [38]. The entropy weight–TOPSIS model efficiently combines the entropy weight method and TOPSIS method. It has the advantages of operability and objectivity. The operation of the entropy weight–TOPSIS method mainly includes the following steps [39,40]:

(1) Build a judgment matrix:

$$A = \left(a_{ij}\right)_{m\times n}$$

(2) Normalize the judgment matrix to obtain the normalized matrix B.
(3) According to the definition of entropy, determine the entropy of the evaluation in dex (H_1):

$$H_1 = \frac{1}{\ln m}\left(\sum_{j=1}^{m} f_{ij}\ln f_{ij}\right); f_{ij} = b_{ij}\sum_{j=1}^{m} b_{ij}$$

(4) The entropy weight of the evaluation index (W):

$$W = (\omega_i)_{1\times n};\ \omega_i = 1 - H_i/n - \sum_{i=1}^{m} H_i$$

(5) Find the weight set of each indicator [$R = \left(r_{ij}\right)_{m\times n}$]:

$$R = B \times W$$

(6) Calculate the weight set according to the entropy weight method above (R), determining the ideal solution (Q_+), and determine the negative ideal solution (Q_-):

$$Q_+ = \left(r_1^+, r_2^+, \ldots, r_n^+\right); Q = \left(r_1^-, r_2^-, \ldots, r_n^-\right)$$

(7) Calculate the distances S_i^+ and S_i^- for each scheme from Q_+ and Q_-:

$$S_i^+ = \sqrt{\sum_{j=1}^{n}\left(r_{ij} - r_j^+\right)^2}; S_i^- = \sqrt{\sum_{j=1}^{n}\left(r_{ij} - r_j^-\right)^2}$$

(8) Calculate the relative closeness of each scheme to the ideal solution (evaluation index):

$$C_i = S_i/\left(S_i^+ + S_i^-\right)$$

In the formula: $C_i \in [0,1]$, and the larger C_i of a certain scheme is, the better the scheme is.

The geographical detector is proposed by Wang Jinfeng et al. [41]. It is used to reveal the differences and driving forces of spatial distribution within a particular geography, including the factor detector, risk detector, interaction detector, and ecological detector. The factor detector module is used to identify independent variables affecting the high-quality evolution. Afterwards, with the help of the interaction detector module, whether there is an interaction of independent variables as a mechanism is further determined:

$$q = 1 - \frac{\sum\limits_{h=1}^{L} N_h \sigma_h^2}{N\sigma^2} \tag{1}$$

where q is a measure of the potency dimension of independent variables, L is the stratification of independent variables, N_h and σ_h^2 are respectively the cell number and variance of layer h, and N and σ^2 are respectively the cell number and variance of the whole study area.

3.4. Geographic-Weighted Regression (GWR)

The GWR is a spatial regression model based on local smooth ideas, which can efficiently estimate the data with spatial autocorrelation and reflect the spatial heterogeneity of the parameters in different regions. It is expressed as:

$$y_i = \beta_0(u_i, v_i) + \sum_{k=1}^{p} \beta_k(u_i, v_i) x_{ik} + \varepsilon_i \tag{2}$$

where β_0 represents the intercept, β_k denotes the estimated regression coefficient of the k-th variable, and ε_i is the random error term.

The "adaptive" and modified Areck Information Guidelines (AICc) were selected for the GWR analysis. In the GWR results, correcting R2 reflects the explanatory force of the independent variable, which is used to test the model performance. When the conditions are less than 0 and greater than 30, a local multicollinearity exists between the variables, and therefore the model operation results are not reliable [42,43].

4. Results and Analysis

4.1. Spatio-Temporal Pattern and Evolution Characteristics of the High-Quality Development of YGR

4.1.1. Characteristics of the Spatio-Temporal Pattern of the High-Quality Development of YGR

The entropy weight–TOPSIS model was used to measure the scores of high-quality development level of 25 prefectures and cities in the YGR (cf. Figure 3). As can be seen from Figure 3, there are significant spatial differences in the level of high-quality development in cities and towns. In 2005, the similarity degree of Kunming and Guiyang was greater than 0.25, and that of Dehong, Diqing, and Nujiang was less than 0.10. Most of the cities were between 0.10 and 0.16, and the high-quality development level in YGR was generally low. In 2010, Kunming became the first city to surpass 0.5, reaching 0.55. In 2015, the similarity degree of Kunming reached 0.68, and the high-quality level of Dehong, southwest Guizhou, and Xishuangbanna also rapidly increased, all exceeding 0.20. In 2018, the high-quality level of Guizhou province surpassed Yunnan province as a whole, forming a development pattern of "high in the east and low in the west". In summary, the high-quality development of Yunnan–Guizhou presents the spatial structure of "central Yunnan–central Guizhou core dual drive". The core is mainly located in Kunming and Guiyang, the provincial capital cities with a high-quality development level, and Nujiang has become the "collapse area" of high-quality development. The problem of the imbalance and insufficiency of high-quality development of the YGR is prominent, and the space between Guizhou and Yunnan is quite different, which needs to be optimized and improved urgently.

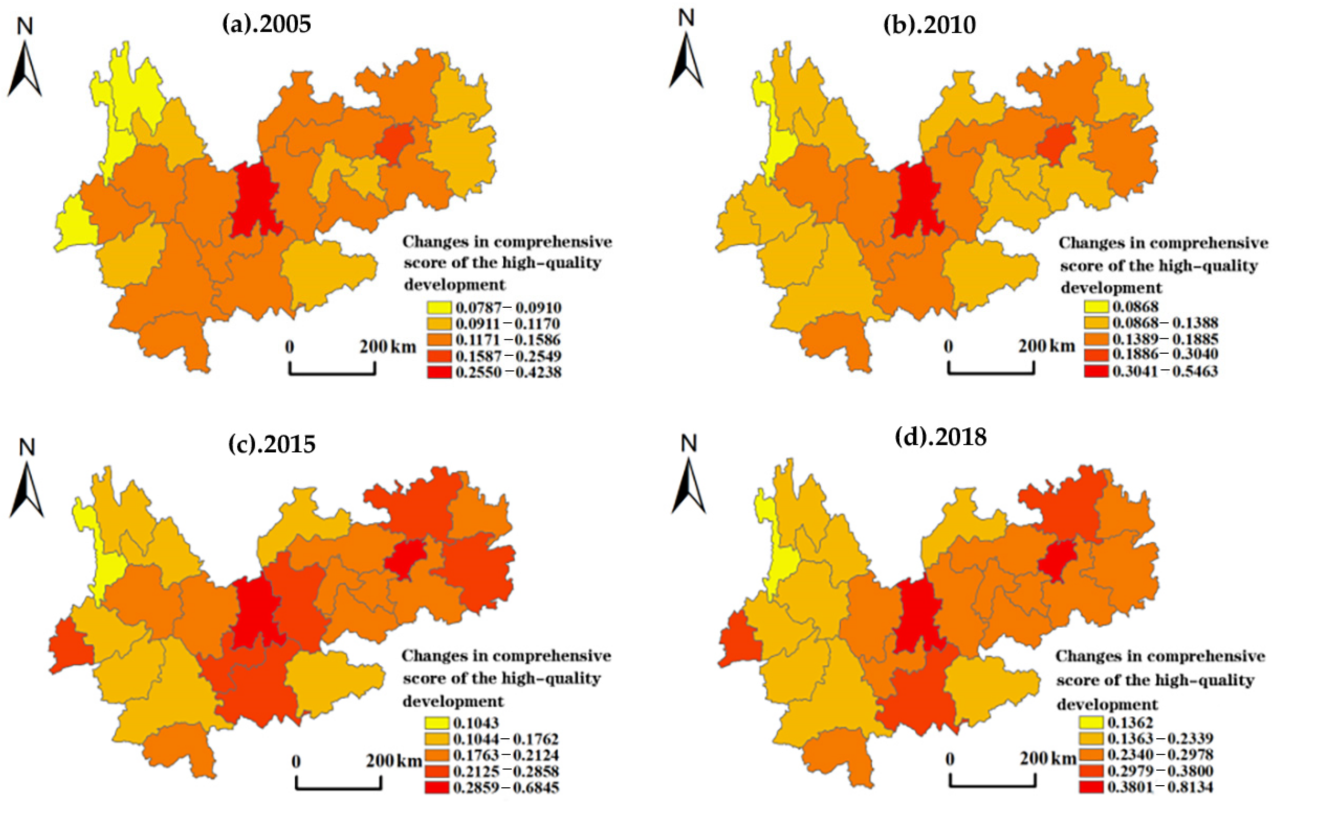

Figure 3. Spatial distribution of the high-quality development level in YGR.

4.1.2. Characteristics of the Spatio-Temporal Evolution of the High-Quality Development of YGR

In order to explore the spacial–temporal evolution characteristics of the high-quality development in Yunnan region, this study subtracted the similarity degree of high-quality development in 2005, 2010, 2015, and 2018 in order to obtain the change of the similarity degree of 2005–2018, 2005–2010, 2010–2015, and 2015–2018 (cf. Figure 4). It can be seen from Figure 4 that, from 2005 to 2018, the level of high-quality development level of cities steadily improved, with the average level of the high-quality development increasing from 0.1368 to 0.2898. In terms of time, the evolution speed of the high-quality development level in YGR presents a development process of "low speed–relatively high speed–high speed". From 2005 to 2010, the average growth rate was 0.0053, which was the low-speed development stage. Therefore, Kunming's high-quality development level has improved the most, while the high-quality development level in southwest Guizhou has declined. From 2010 to 2015, the average growth rate was 0.0139, which is a relatively high-speed development stage. In addition, the Guiyang's high-quality development level increased the most, while the high-quality development level of Nujiang and Diqing was the least. From 2015 to 2018, the average growth rate was 0.0191, which is the stage of high-speed development. Among them, the high-quality development level of Kunming and Honghe was improved the most, while the high-quality development level of Guiyang had decreased.

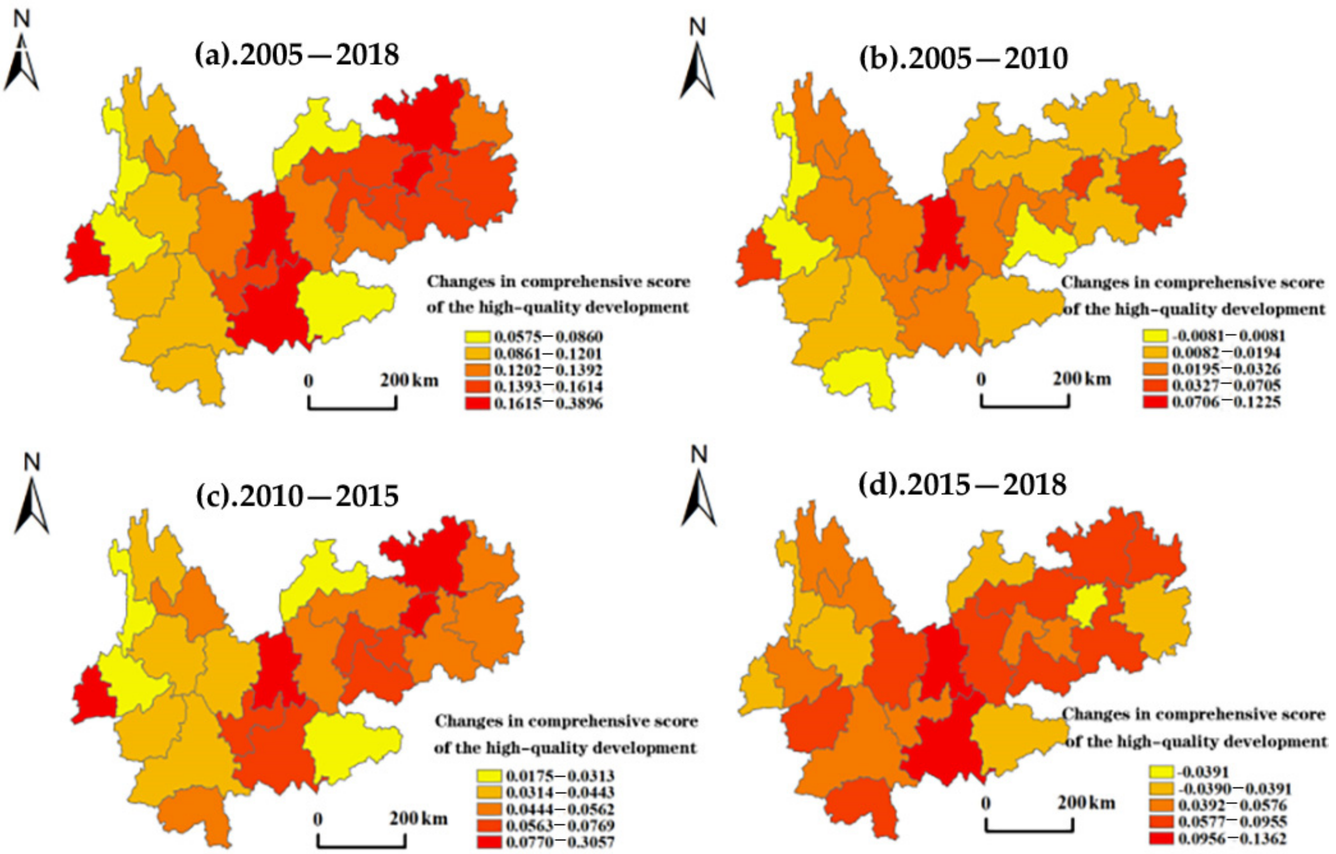

Figure 4. The Evolution of the high-quality development process in the YGR.

4.2. Identification of the Influencing Factors on the Spatio-Temporal Evolution of the High-Quality Development of YGR

4.2.1. Geographic Detection Results of the Influencing Factors

The spatial–temporal differentiation of the high-quality development in YGR is relatively remarkable. In order to deeply analyze the factors affecting the spatio-temporal evolution of the high-quality development in different prefectures, the research refers to the method of Shi Yanwen et al. [44]. The similarity degree of the change difference of high-quality development and the change difference of each index were considered as the dependent variables. The geographical detector was then used to probe the driving mechanism of the evolution of high-quality development.

The main steps are as follows. First, use SPSS software to perform discretization and optimal grading of each independent variable. Second, use Equation (1) to calculate the influence of each detection factor on the evolution of high-quality development. The top five factors affecting the evolution of the high-quality development over the years were: the change value of urban built-up area (X_1), change value of per capita GDP (X_2), change value of total import and export (X_3), change value of tourism income (X_4), and change value of total fixed asset investment (X_5). These values frequently appeared. The high frequency of occurrence can be identified as the main influencing factors of the change of the high-quality development level in prefectures around Yunnan and Guizhou [45] (cf. Table 2).

Table 2. Geo-detection results for the drivers.

Particular Year	Urban Built-Up Area Change Value (X_1)	Per Capita GDP Change Value (X_2)	Total Import and Export Change Value (X_3)	Tourism Income Change Value (X_4)	Gross Fixed Asset Formation Change Value (X_5)
2005–2018	0.6346	0.6607	0.8518	0.7861	0.7930
2005–2010	0.6986	0.3931	0.6960	0.4040	0.7040
2010–2015	0.8030	0.7470	0.9046	0.7796	0.3992
2015–2018	0.2213	0.2329	0.7412	0.1634	0.5512

Table 2 shows that from 2005 to 2018, the order of influencing factors on the evolution of the high-quality development is as follows (sort from the largest to the smallest): change of total import and export, change of total fixed asset investment, change of tourism income, change of per capita GDP, change of urban built-up area. In terms of time, from 2005 to 2010, the change of total fixed asset investment had the greatest influence on the high-quality development of Yunnan and Guizhou provinces. From 2010 to 2015, except for the reduction of total fixed asset investment, the effect on the high-quality development and evolution of YGR decreased, the other indicators increased, and the change of the total import and export played the biggest role in the high-quality development. From 2015 to 2018, except for the increase of the change of the total fixed asset investment on the high-quality development of YGR, the impact of the other indicators on the high-quality development and evolution of the YGR decreased. However, the change of the total import and export was still the biggest. This demonstrates that the changes in total imports and exports are the leading factors affecting the evolution of the high-quality development of the YGR.

4.2.2. Spatial Differences in the Role of the Influencing Factors

The GWR model was further introduced for local spatial regression analysis. Five independent variables were considered as explanatory variables affecting the high-quality development evolution of the YGR, in order to explore the spatial differences of the direction and intensity of the five explanatory variables in different analysis units [42,46]. It can be seen from Table 3 that the correction R^2 of each time period is respectively 0.6228, 0.9659, 0.8852, and 0.9428, and the number of conditions (Cond) is less than 30, indicating that the model passes multicollinearity diagnosis, has a high goodness of fit, and also reflects the credibility of the factor detection results.

Table 3. Parameter estimation and test results of the GWR model.

Time	R^2	MAX (Cond)	MIN (Cond)
2005–2018	0.9428	13.0260	9.8235
2005–2010	0.6228	19.4671	16.7829
2010–2015	0.9659	13.5091	9.5660
2015–2018	0.8852	10.3967	7.3962

The regression coefficients of independent variables are observed for the regression results of GWR model in different periods (cf. Figure 5). The results show that the independent variables in different periods have obvious spatial differences in the evolution of the high-quality development in YGR, but the distribution patterns are different.

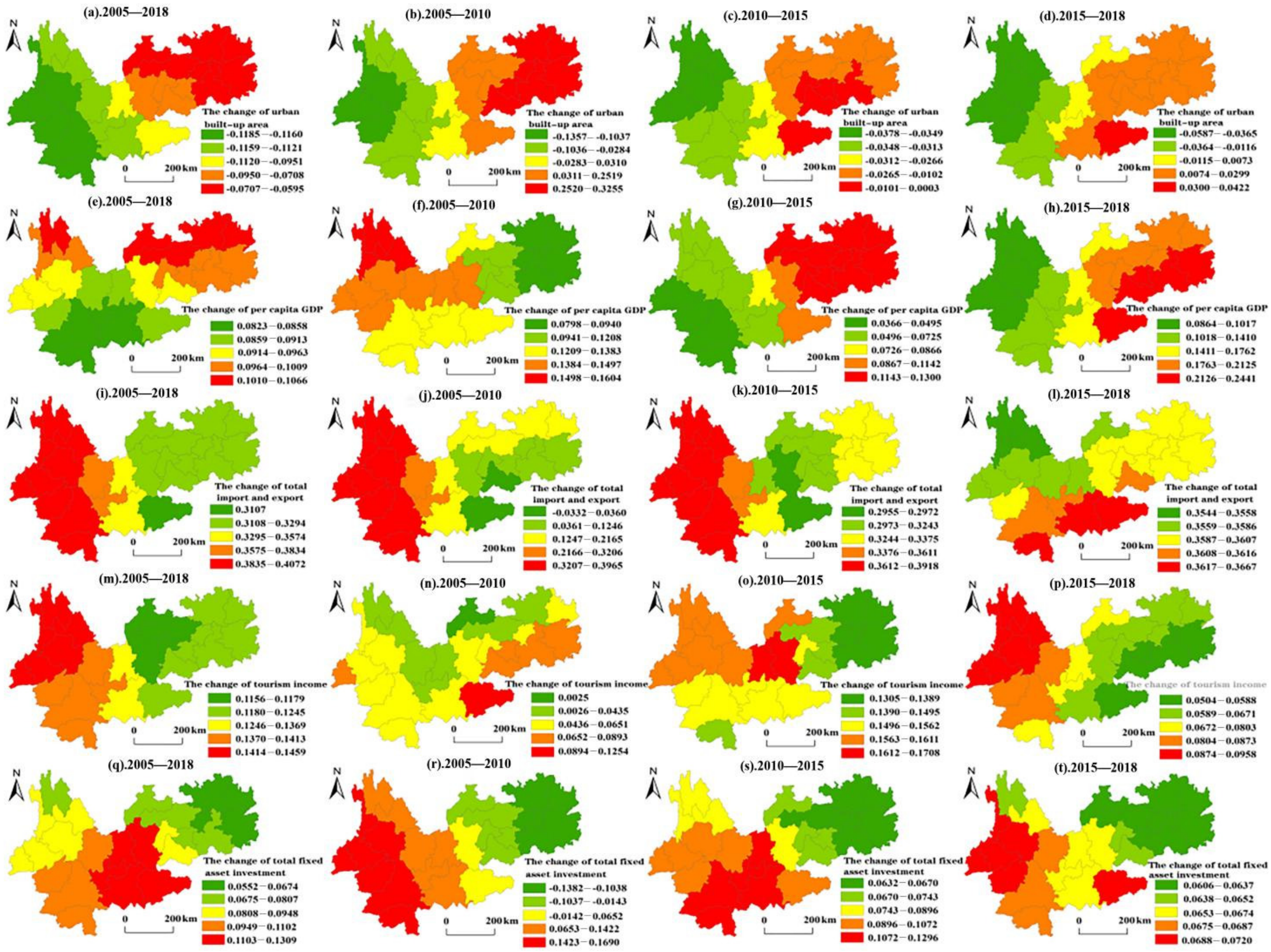

Figure 5. Spatial distribution of the regression coefficients for the GWR models, at different time periods.

(1) The action model of the change in urban built-up areas

From 2005 to 2018, the change of urban built-up area was negatively associated with the evolution of high-quality development, with a regression coefficient between −0.1185 and −0.0595, which was generally weakened from west to east. The high value area is concentrated in the western border area of the Yunnan province, while the low area is concentrated in the north, east and southeast of the Guizhou province. This illustrates that simple urban expansion is not conducive to the high-quality development of the backward western border area of Yunnan province. In terms of time, the impact of the urban built-up area in the area of urban built-up area on Guizhou province shows positive and negative alternations over time, indicating that the effect of the urban built-up area at different stages of development will also change.

(2) The action model of the change of per capita GDP

From 2005 to 2018, the change of per capita GDP is positively related to the evolution of high-quality development, with a regression coefficient ranging from 0.0823 to 0.1066. The effect is stronger in the north and weaker in the south. More precisely, Diqing, Zhaotong, Bijie, Zunyi, and Tongren are more significantly affected by GDP changes. In terms of time, per capita GDP changes have great spatial succession on the evolution of high-quality development. From 2005 to 2010, the high-value areas were mainly concentrated in the northwest of Yunnan province. From 2010 to 2015, the high-value areas were mainly concentrated in Guizhou province and Zhaotong. From 2015 to 2018, the high-value areas were mainly concentrated in the southern part of Guizhou province and Wenshan.

(3) The action model of the change of total import and export

From 2005 to 2018, the change of total import and export shows a positive correlation with the evolution of high-quality development. The regression coefficient ranges from 0.3107 to 0.4072, which is generally characterized by a weakening from west to east. The high-value areas are concentrated in Nujiang, Baoshan, Dehong, Lincang, Pu'er, and Xishuangbanna. These prefectures are located in the southwest border, and therefore the location advantage is large. As Yunnan has been striving to be the radiation center in southeast Asia in recent years, it has frequently traded with neighboring countries. The increase of total imports and exports is the main driving force to promote the development of a high quality in border areas. In terms of time, changes in the total foreign trade has a great impact on high-quality development and evolution. The high-value areas in 2005–2010 and 2010–2015 were mainly concentrated in the western border area of Yunnan province. However, the high-value areas shifted in 2015–2018, which had a greater influence in the southern border areas of Yunnan province.

(4) The action model of the change of tourism income

From 2005 to 2018, the change in tourism income is correlated with the evolution of high-quality development, and the regression coefficient is between 0.1156 and 0.1459. This shows the characteristics of "high in west and low in east". The high-value areas are concentrated in Diqing, Nujiang, Dehong, Dali, Lijiang, and Baoshan. This may be due to the decisive battle against poverty in recent years, and Yunnan is committed to building the "Great West Yunnan tourism loop", which has played a strong role in promoting high-quality development. In terms of time, the region of the change of tourism income having a significant impact on high-quality development had transferred from Wenshan to Kunming-Qujing and then to the northwest region of Yunnan province.

(5) The action model of the change of total fixed asset investment

From 2005 to 2018, the change of fixed asset investment is also positively correlated with the evolution of high-quality development, with a regression coefficient ranging between 0.0552 and 0.1309. In terms of regions, the regions with the largest regression coefficient are Kunming, Qujing, Yuxi, Honghe, and Wenshan, while those having the smallest coefficient are Guiyang, Zunyi, Tongren, and southeast Guizhou. In general, Yunnan province, especially Kunming and its surrounding cities, is more dependent on fixed asset investments.

4.3. Quantitative Expression of Influencing Factors

Given that the impacts of different factors on the evolution of high-quality development may not be independent, the interaction of five major influencing factors was further tested. The detection results show that the action mode and intensity of the influencing factors are different (cf. Table 4).

Table 4. Interaction detection results of the influencing factors.

Each Other Factor	A Particular Year	Comparison of Interaction Values	Each Other Act on	Each Other Factor	A Particular Year	Comparison of Interaction Values	Each Other Act on
$X_1 \cap X_2$	2005–2018	0.76 > Max[q (X_1 = 0.63), q (X_2 = 0.66)]	Double factor enhancement	$X_2 \cap X_4$	2005–2018	0.87 > Max[q (X_2 = 0.66), q (X_4 = 0.79)]	Double factor enhancement
	2005–2010	0.75 > Max[q (X_1 = 0.70), q (X_2 = 0.39)]	Double factor enhancement		2005–2010	0.89 > q (X_2 = 0.39) + q (X_4 = 0.40)	Nonlinear enhancement
	2010–2015	0.87 > Max[q (X_1 = 0.80), q (X_2 = 0.75)]	Double factor enhancement		2010–2015	0.88 > Max[q (X_2 = 0.75), q (X_4 = 0.78)]	Double factor enhancement
	2015–2018	0.45 = q (X_1 = 0.22) + q (X_2 = 0.23)	independence		2015–2018	0.75 > q (X_2 = 0.23) + q (X_4 = 0.16)	Nonlinear enhancement
$X_1 \cap X_3$	2005–2018	0.91 > Max[q (X_1 = 0.63), q (X_3 = 0.85)]	Double factor enhancement	$X_2 \cap X_5$	2005–2018	0.83 > Max[q (X_2 = 0.66), q (X_5 = 0.79)]	Double factor enhancement
	2005–2010	0.73 > Max[q (X_1 = 0.70), q (X_3 = 0.70)]	Double factor enhancement		2005–2010	0.88 > Max[q (X_2 = 0.39), q (X_5 = 0.70)]	Double factor enhancement
	2010–2015	0.96 > Max[q (X_1 = 0.80), q (X_3 = 0.90)]	Double factor enhancement		2010–2015	0.86 > Max[q (X_2 = 0.75), q (X_5 = 0.40)]	Double factor enhancement
	2015–2018	0.86 > Max[q (X_1 = 0.22), q (X_3 = 0.74)]	Double factor enhancement		2015–2018	0.77 > Max[q (X_2 = 0.23), q (X_5 = 0.55)]	Double factor enhancement
$X_1 \cap X_4$	2005–2018	0.87 > Max[q (X_1 = 0.63), q (X_4 = 0.79)]	Double factor enhancement	$X_3 \cap X_4$	2005–2018	0.93 > Max[q (X_3 = 0.85), q (X_4 = 0.79)]	Double factor enhancement
	2005–2010	0.80 > Max[q (X_1 = 0.70), q (X_4 = 0.40)]	Double factor enhancement		2005–2010	0.83 > Max[q (X_3 = 0.70), q (X_4 = 0.40)]	Double factor enhancement
	2010–2015	0.96 > Max[q (X_1 = 0.80), q (X_4 = 0.78)]	Double factor enhancement		2010–2015	0.96 > Max[q (X_3 = 0.90), q (X_4 = 0.78)]	Double factor enhancement
	2015–2018	0.82 > q (X_1 = 0.22) + q (X_4 = 0.16)	Nonlinear enhancement		2015–2018	0.89 > Max[q (X_3 = 0.74), q (X_4 = 0.16)]	Double factor enhancement
$X_1 \cap X_5$	2005–2018	0.86 > Max[q (X_1 = 0.63), q (X_5 = 0.79)]	Double factor enhancement	$X_3 \cap X_5$	2005–2018	0.92 > Max[q (X_3 = 0.85), q (X_5 = 0.79)]	Double factor enhancement
	2005–2010	0.81 > Max[q (X_1 = 0.70), q (X_5 = 0.70)]	Double factor enhancement		2005–2010	0.76 > Max[q (X_3 = 0.70), q (X_5 = 0.70)]	Double factor enhancement
	2010–2015	0.87 > Max[q (X_1 = 0.80), q (X_5 = 0.40)]	Double factor enhancement		2010–2015	0.98 > Max[q (X_3 = 0.90), q (X_5 = 0.40)]	Double factor enhancement
	2015–2018	0.79 > q (X_1 = 0.22) + q (X_5 = 0.55)	Nonlinear enhancement		2015–2018	0.79 > Max[q (X_3 = 0.74), q (X_5 = 0.55)]	Double factor enhancement
$X_2 \cap X_3$	2005–2018	0.92 > Max[q (X_2 = 0.66), q (X_3 = 0.85)]	Double factor enhancement	$X_4 \cap X_5$	2005–2018	0.88 > Max[q (X_4 = 0.79), q (X_5 = 0.79)]	Double factor enhancement
	2005–2010	0.75 > Max[q (X_2 = 0.39), q (X_3 = 0.70)]	Double factor enhancement		2005–2010	0.82 > Max[q (X_4 = 0.40), q (X_5 = 0.70)]	Double factor enhancement
	2010–2015	0.95 > Max[q (X_2 = 0.75), q (X_3 = 0.90)]	Double factor enhancement		2010–2015	0.86 > Max[q (X_4 = 0.78), q (X_5 = 0.40)]	Double factor enhancement
	2015–2018	0.85 > Max[q (X_2 = 0.23), q (X_3 = 0.74)]	Double factor enhancement		2015–2018	0.90 > q (X_4 = 0.16) + (X_5 = 0.55)	Nonlinear enhancement

(1) The influencing factors

From 2015 to 2018, changes in urban built-up area (X_1) and changes in per capita GDP (X_2) had independent impacts on the spatial differentiation of the high-quality development evolution. In addition, the results of the interaction between urban built-up area changes (X_1) during 2005–2010, 2010–2015, and 2005–2018 show a double-factor enhancement or a nonlinear enhancement. This shows that the combination of urban built-up area changes (X_1) and other factors will increase the explanatory power of the spatial differentiation of the high-quality development evolution. From 2015 to 2018, the interaction between per capita GDP changes (X_2) and the urban built-up area changes (X_1) is independent. Except for that, the interaction between the per capita GDP changes (X_2) and tourism revenue changes (X_4) during 2005–2010 and 2015–2018 is a non-linear enhancement. The interaction between per capita GDP (X_2) and other factors in other periods is a double-factor enhancement. Therefore, when per capita GDP changes (X_2) interact with the other factors pairwise, the action yielded are greater than their own action alone. In the four time periods, the interaction between the change of total import and export (X_3) and the other four influencing factors is enhanced by double factors. When the total import and export changes (X_3) interact with the other factors pairwise, the yielded actions are greater than their own action alone. Similarly, the tourism revenue changes (X_4) and total fixed asset investment changes (X_5) interact with the other factors pairwise; the action and produced actions are greater than the individual action of one of the individual factors.

(2) The strength of influencing factors

From 2005 to 2018, the interaction between the total import and export changes (X_3) and tourism income changes (X_4) was the largest, reaching 0.93. From 2005–2010, the interaction between per capita GDP changes (X_2) and tourism income changes (X_4) was the largest, reaching 0.89. From 2010 to 2015, the interaction between the change of total import and export (X_3) and the change of total fixed asset investment (X_5) was the largest, reaching 0.98. From 2015 to 2018, the interaction between the change of tourism income (X_4) and the change of total fixed asset investment (X_5) was the largest interaction, reaching 0.90.

5. Discussion

5.1. Discussion on High Quality Development Level

The high-quality development of Yunnan Guizhou region is an important support for China's high-quality development. This study found that the economic growth of Yunnan and Guizhou presents a spatial pattern of "fast in the East and slow in the west" [47], resulting in the distribution trend of "high in the East and low in the west" of the current high-quality development level, indicating that the high-quality development of Guizhou Province is higher than that of Yunnan Province. In recent years, with Guizhou actively developing its tourism and health industries and strengthening the construction of transportation infrastructure and investments in science and technology according to its own resource endowment, the level of high-quality development has been rising, making the high-quality development level of Guizhou province gradually higher than that of Yunnan Province.

5.2. Discussion on Influencing Factors

High-quality development is the new goal of China's economic and social development. However, due to regional differences, the level of high-quality development is different, and different factors that affect the high-quality development exist [12,15,48–50]. For instance, Chen et al. [51] demonstrate that the number of full-time college teachers, number of college students, per capita living area, and per capita green space area are the main factors affecting the high-quality development of the Yellow River Basin. In the urban agglomeration of Yangtze River Delta, the infrastructure and public service elements are the main obstacles affecting the construction of a high-quality ecological city [52]. In Zhejiang province, the high-quality and coordinated development is affected by the economic strength, agglomeration capacity, government financial support, and infrastructure level [8]. Furthermore, the study also confirmed that it is not advisable for Yunnan to unilaterally use the "Great Leap Forward" urbanization expansion strategy [53]. Therefore, based on the resource endowment and location characteristics of different regions, studying the evolution of high-quality development and the influencing factors is of theoretical and practical significance.

5.3. Limitations and Policy Implications

This study analyzed the level and influencing factors of high-quality development in the Yunnan–Guizhou region, but there are still some deficiencies. First, when constructing the index system of high-quality development, due to the availability of data, this study only selected four aspects: resources, economy, ecology, and society. However, as a new development direction of China at this stage, high-quality development has rich connotations. Therefore, the index system needs to be further improved. Second, this study used the data of four periods in 2005, 2010, 2015, and 2018. In future research, data comprising a continuous time scale should be supplemented, so as to better capture the continuous dynamic changes of the high-quality development in the Yunnan–Guizhou region.

The high-quality development in the YGR is a long-term systematic project. Moreover, promoting the high-quality development in southwest inland region is crucial to support the high-quality development of the whole country. Hence, the Yungui–Guizhou region is supposed to actively integrate into the national development strategy, give full play to its resource and location advantages in energy, tourism, and other aspects, actively integrate into the Belt and Road Initiative, adhere to the opening-up of areas to the outside world, and give full play to its development potential.

6. Conclusions

In this study, the Yunnan–Guizhou region was selected as the research area. Based on the constructed index system of high-quality development, 25 prefecture level cities were evaluated by the entropy weight–TOPSIS model, then the factors affecting regional high-quality development were analyzed by the geographic detector method, and, finally, the direction and intensity of the influencing factors were evaluated by the GWR method. The conclusions of this study are as follows:

(1) The high-quality development in the Yunnan–Guizhou area generally presents the spatial pattern of "central Yunnan–central Guizhou core dual drive" and "high east and low west". In other words, Kunming and Guiyang have a higher development level. The high-quality development level of Guizhou province is higher than that of Yunnan province. In addition, the evolution speed of high-quality development in YGR generally presents the characteristics of "low speed–relatively high speed–high speed".

(2) The evolution of high-quality development in the YGR is mainly affected by the change of urban built-up area, per capita GDP, total foreign trade import and export, tourism income, and total fixed asset investment. The change of urban built-up area has both positive and negative correlation effects on the evolution of the development of the YGR in different time periods. The impact intensity generally decreased from west to east. Changes in per capita GDP and tourism income have positive correlated effects across all the time periods. The influence intensity decreased from north to south, and from west to east, respectively. The changes in total import and export and total fixed asset investment had negative correlation effects in a few cities at the early stage of the study. However, it gradually became a positive correlation effect for all the cities as the time increased. The influence intensity decreased from west to east and from center to east and west, respectively.

(3) The five influencing factors on the evolution of high-quality development in the YGR have some differences in the mode and intensity of action in different time periods.

Three forms exist in terms of action modes: dual factor enhancement, nonlinear enhancement, and the independent form. In terms of effect intensity, from 2005 to 2018, the change of total import and export and tourism income, had the strongest interaction. From 2005 to 2010, the interaction between the change of per capita GDP and tourism income was the strongest. From 2010 to 2015, the change of total import and export had the strongest interaction with the change of the total fixed asset investment. From 2015 to 2018, the change of tourism income had the strongest interaction with the change of the total fixed asset investment.

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