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Retraction

Retracted: Innovation Capacity, Industrial Structure, and Regional Development of High Quality: Empirical Research Based on the County Level

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope

(2) Discrepancies in the description of the research reported

(3) Discrepancies between the availability of data and the research described

(4) Inappropriate citations

(5) Incoherent, meaningless and/or irrelevant content included in the article

(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] C. Zhao and H. Yao, "Innovation Capacity, Industrial Structure, and Regional Development of High Quality: Empirical Research Based on the County Level," *Journal of Function Spaces*, vol. 2022, Article ID 4446292, 13 pages, 2022.

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Research Article

Innovation Capacity, Industrial Structure, and Regional Development of High Quality: Empirical Research Based on the County Level

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The key to China's regional high-quality development lies in county-level coordination and promotion. Therefore, based on 2847 county-level administrative units in China, this paper uses empirical analysis methods such as dynamic spatial panel Dobbin model and intermediary effect model to study.Then we test the relationship between the industrial structure of county innovation capacity and regional development of high quality. The results showed that (1) the regional development of high quality at the county level in China was generally distributed in clusters, and the agglomeration had a further trend of strengthening. (2) The innovation ability and industrial structure also had a positive effect on the regional development of high quality at the county level, and the result was significant. (3) Innovation had both direct and indirect effects on regional development of high quality. Industrial structure and regional development of high quality had strong spatial and temporal dependence effects.

1. Introduction and the Presentation of Questions

As China has achieved a historic victory in achieving its goal of poverty alleviation, it has accomplished the huge task of eliminating absolute poverty for the largest population in the world. As China enters the postpoverty alleviation era, we need not only prevent vulnerable groups on the edge of poverty and areas with poor quality from returning to poverty, but also eliminate relative poverty. So we can narrow the income gap, achieve synchronous income increase, and effectively link poverty alleviation with the rural revitalization strategy. In 2021 the government work report was referred to " speed up the development of rural industry and strengthen county economies, broadening the employment channels" of farmers, and stressed that "strengthen rural basic public services and public infrastructure construction and promote urban and rural integration development" in the county. The characteristics of the county economy in China are becoming the center, the town as the link. As the most basic unit of national economic operation, a series of measures, such as consolidating the achievements of poverty alleviation, promoting farmers' income increase, and promoting rural revitalization strategy, will be implemented at the county level [1]. The 14th Five-Year Plan points out that the theme of the 14th Five-Year Plan period is regional development of high quality. Not only has the economic development entered the stage of regional development of high quality, but also the society, ecology, culture, and national governance system have entered the stage of regional development of high quality The county's regional development of high quality will be the key to achieve socialist modernization. At present, there are nearly 3,000 county-level administrative regions in China, which are extremely uneven in geographical distribution. Therefore, it is very important to find out the key factors affecting the regional distribution differences of regional development of high quality in county areas for comprehensively promoting

the rural revitalization strategy and regional collaborative development in the next step.

2. Literature Review

High-quality development is the latest development concept which is put forward by China as it enters the new era. Its core lies in paying more attention to the quality and efficiency of development, which has a certain enlightenment significance for the development concept of all countries in the world. Innovation is the fundamental power to promote the development of the economy to a higher stage and has been widely concerned by scholars for a long time. In 1934, Schumpeter emphasized the role of innovation for the first time in his Theory of Economic Development, which caused extensive attention to innovation in the academic world. Innovation is the main driving force supporting the construction of the modern economic system. " There is a strong coupling coordination relationship between technological innovation and the high quality of economic development [2], especially in the county level. Because scientific and technological innovation enterprises and first-class scientific research institutions are located in the urban circle. Therefore, innovative talents are first concentrated in large urban agglomerations. On the basis of the radiating and driving play of science and technology innovation, it is an emerging impact on the traditional process of transformation and upgrading of industrial structure. This will lead to the unbalanced spatial distribution of regional development of high-quality counties.

2.1. Innovation Capability and Regional Development of High Quality. Since Schumpeter first proposed the role of innovation, it has become a consensus that technological progress has a positive impact on economic development. Many scholars have empirically tested the positive effect of technological innovation on social, economic, and regional development [3–5]. Specifically, the role of innovation is reflected as follows:

Firstly, technological innovation diffusion drives industrial structure mutation and upgrading and market innovation. Technological innovation improves the overall performance of the market by changing the mode of enterprise benefit growth and promotes the transformation from capital and labor-driven to innovation-driven [6], from the imitator business model from 1 to N to the original model like from 0 to N [7]. Comprehensive innovation performance in different fields can be improved by comparing products, processes, and services [8].

Secondly, the transformation and application of technological innovation achievements will promote the formation of "industry-university-research-enterprise-city" business alliance [9]. Knowledge spillovers and diffusion among innovative enterprises not only interact with related industries and relevant innovation subjects but also form innovation connections with universities and research institutions, drive the integration and aggregation of scientific research resources, and provide the efficiency of industry-university-research collaborative innovation [10]. It will go through the intermediate product or technology transfer to the market demands ultimately. So it will meet the realistic needs of economic society and technological innovation development [11].

Thirdly, the creation of an innovative system and innovative environment will force the improvement of government governance ability. Science and technology innovation needs innovative talents cultivation and other aspects of financial investment joint implementation. Asked the government to strengthen and support the attention of the scientific and technological innovation, an environment conducive to scientific research and development of innovation. Government research, for example, creates an environment that facilitates research and development. At the same time, it could reduce the uncertainty of the innovation system and also needs a series of science and technology policies as a guarantee, which is to improve national innovation ability and the comprehensive strength of the important means [12], through mastering key technologies to form leading achievements and promote the establishment of the modernization-oriented industrial system [13].

2.2. Innovation Capacity and Industrial Structure. China's industrial development system is characterized by the interactive evolution of economic growth and industrial structure change. And innovation-driven development plays a driving role in the evolution and upgrading of industrial structures. It can not only directly affect economic growth, but also affect total factor productivity through the factor allocation effect and then indirectly affect economic growth [14].

Firstly, human innovation improves labor productivity [15], because the level of labor education and the quality of labor force have effectively improved labor productivity and formed a dynamic mechanism of knowledge innovation. Accordingly, the production efficiency of the department is also improved.

Secondly, through improving the market demand structure of product innovation, innovative technology will give birth to new products. With the emergence of new products, consumers have more choices. As market participants exert pressure on product demand, market share forces market participants to introduce new technologies to promote the development and upgrading of new products. Therefore, the original industrial chain extends upward and downward and is improved [16].

Finally, R&D innovation changes the life cycle of enterprises. The departments that carry out technological innovation first will have crowding out effect on the old departments with backward technology and low efficiency, greatly shortening the life cycle of these enterprises and promoting the positive evolution of the overall industrial structure [17].

From the review of the above literature, at present, the focus of academic circles is on how scientific and technological innovation impacts the upgrading of industrial structure. But it has not been found that the three have been brought into a unified framework and their logical relationship and mechanism of action have been deeply discussed. Regional development of high quality, as an evolving overall concept of development, is the result of a highly modernized and evolving economic system, social system, and

Table 1: Evaluation index system of county regional development of high quality.

The first-level indicators	The secondary indicators	Basic indicators
The development of kinetic energy	Innovation power	The added value of cultural and creative industries accounted for the proportion of GDP
	The innovation of human	Number of universities and research institutes
		The number of 500 private enterprises
The development of the structure	Coordination of urban and rural areas	Engel coefficient of urban households
		Per capita disposable income to per capita GDP
		Per capita disposable income of urban and rural residents
	Ability to open	Number of commercial and trade enterprises
		Number of logistics express outlets
		The density of road network
		Added value to accommodation and catering industry
Development of effective	Green development	The surface water reaches or exceeds the proportion of the three types of water bodies
		Proportion of days with good air quality
		The reduction rate of water consumption per ten thousand yuan of GDP
		Electricity consumption per ten thousand yuan of GDP
		The decrease rate of construction land per unit of GDP
	Results the shared	Percentage of townships covered by public transportation
		Proportion of congested roads
		Second-hand housing price
		Coverage of medical and health institutions in townships and towns

institutional system [18], showing the characteristics of integrity, systematization, and structure. Knowledge economy, as the best practice to change the economic nature and human lifestyle [19], is the key to catch up with the first countries. With the transformation of the main social contradiction in China, the model of resource allocation will be transformed from government-led to market-led, which will determine the corresponding change of China's industrial system and industrial structure [20]. There is a close logical relationship between the transformation of old and new driving forces, upgrading of industrial structure, and transformation of development mode. Based on previous studies, this paper will expand as follows: First, from the perspective of research, we will take scientific and technological innovation ability as a direct influencing factor, and regional development of high quality will become its final result. Industrial structure upgrading will connect that two factors together just like a bridge. So this three factors will establish an effective connection and believe that scientific and technological innovation ultimately promotes regional development of high quality through the intermediary role of industrial structure. Second, from the perspective of research method, it investigates from the county level. In order to provide empirical evidence for theoretical hypothesis, dynamic panel space Dubin model which can overcome time lag effect, space lag effect, and endogeneity problem at the same time is adopted.

3. Theoretical Model

3.1. Variable Selection. Explained variable: comprehensive index of regional development of high quality ($rdhq_{i,t}$). As a comprehensive indicator, high-quality development has a wide range of meanings, and replacing one or several indicators will inevitably lead to deviation. Therefore, it is concluded by establishing an indicator system. Regional development of high quality as a comprehensive indicator, based on existing studies [21, 22], constructed a county regional development of high-quality evaluation index system, including three first-level indicators of development momentum, development structure and development effect, six second-level indicators, and 19 basic index, as shown in Table 1. The comprehensive index of regional development of high quality of county was calculated according to the evaluation index system of regional development of high quality of county ($rdhq_{i,t}$). Firstly, the basic indexes in the index system were standardized to eliminate the dimensional influence. Secondly, the indexes were synthesized by factor analysis method in SPSS23.0.

Core explanatory variables: county innovation ability: existing studies [23] believe that R&D resources (capital and human expenditure) are the most important factor input affecting regional innovation performance. Therefore, the full-time R&D equivalent of scientific research personnel (ins_{jt}) and the proportion of R&D expenditur in GDP (ie_{it}) are selected as the core indicators to measure the innovation capacity of counties [24, 25].

Industrial structure: according to existing studies [26], industrial structure upgrading refers to the process of industrial structure from low level to high level according to the law of economic development. It includes the improvement of the overall technical level, which is measured by the proportion of added value of the tertiary industry (is_{it}). The added value of the tertiary industry proportion can reflect

Table 2: Qualitative description of each variable.

Variable categories	Symbol	Meaning	Metrics and descriptions
Explained variable	rdhq	Regional development of high quality in counties	County high-quality development evaluation index system calculated
Explanatory variables	ins	Innovation main body	Researchers develop equivalents full-time
	ie	Innovation environment	Proportion of R&D expenditure in GDP
	Is	The industrial structure	Proportion of added value of tertiary industry
Control variables	ly	Per capita income	Per capita disposable income of urban residents
	ur	Level of urbanization	Permanent population urbanization rate
	ltp	Advances in technology	Amount of technology trading contract
	wl	Labor force level	Proportion of working-age population
	lop	Opening to the outside world	Foreign direct investment
	ps	Policy support	Proportion of added value of high-tech industry
	pg	GDP per capita	GDP per capita

the relation between the ratio between the industry, which is one of the commonly used indicators of the world and academia.

Control variables: in consideration of the influence of other factors on regional development of high quality of counties, control variables such as per capita income, urbanization level, and technological progress are selected, as shown in Table 2:

3.2. Model Specification. In order to test whether industrial structure can act as a mediating variable, the mediation effect model is adopted for empirical study, and the indirect effect of explanatory variable X on explained variable Y through intermediary variable M is referred to as the mediation effect [27], as shown in Figure 1:

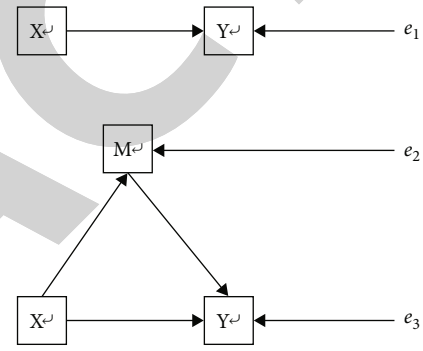

Figure 1: The working flow of mediating effect model.

$$Y = cX + e_1, \tag{1}$$

$$M = aX + e_2, \tag{2}$$

$$Y = c'X + bM + e_3. \tag{3}$$

The testing procedures of mediation effect in existing studies [28] include the following: First, it is necessary to test the regression coefficient C in Formula (1). If the regression coefficient C is found to be significant in the test results, it can be considered that there is a mediation effect in the model. However, whether the regression coefficient C is significant or not, subsequent testing steps should be carried out. Secondly, it is necessary to test the regression coefficients A and B in Formulas (2) and (3). If both are significant, indirect effects are considered. Finally, the coefficient C' in Formula (3) is tested to observe whether the coefficient is significant. If c' is not significant, it is considered that there is only a mediation effect but no direct effect, which is called complete mediation effect. If c' is significant, the direct effect is considered to exist at the same time, which is called partial mediation effect.

According to the above analysis, the innovation ability of science and technology, industrial structure, and regional development of high quality into test model, because of the difference of China's nearly three thousand county-level administrative divisions, is more obvious, and the county territory economic growth and development of high quality has obvious agglomeration in the spatial distribution of the trend, so we need to consider its inherent spatial spillover effects. In spatial metrology, the spatial autocorrelation means that the second-order effect of data is generated by the similarity of variables in adjacent regions, including Moran's I, Geary's C, Getis, and Join Count. Moran's I is selected for measurement, which is usually expressed as

$$I = \frac{n}{\sum_{i=1}^{n}(y_i - \bar{y})^2} \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}(y_i - \bar{y})\left(y_j - \bar{y}\right)}{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}}. \tag{4}$$

Among Formula (4), I is the spatial autocorrelation index with a value range of (-1, 1), and $I > 0$ is a positive correlation, reflecting the agglomeration effect. When $I < 0$, the correlation is negative, reflecting the dispersion effect. $I = 0$ means no correlation, and the spatial features show randomness. w_{ij} is the spatial weight matrix, which represents the proximity between region i and region j. The significance test of Moran's I is realized by constructing a statistic $Z = (I - E(I))(Var(I))^{-1/2}$ subject to normal distribution. When Z value is significantly positive, interregional similarity tends to cluster; when Z value is significantly negative, interregional

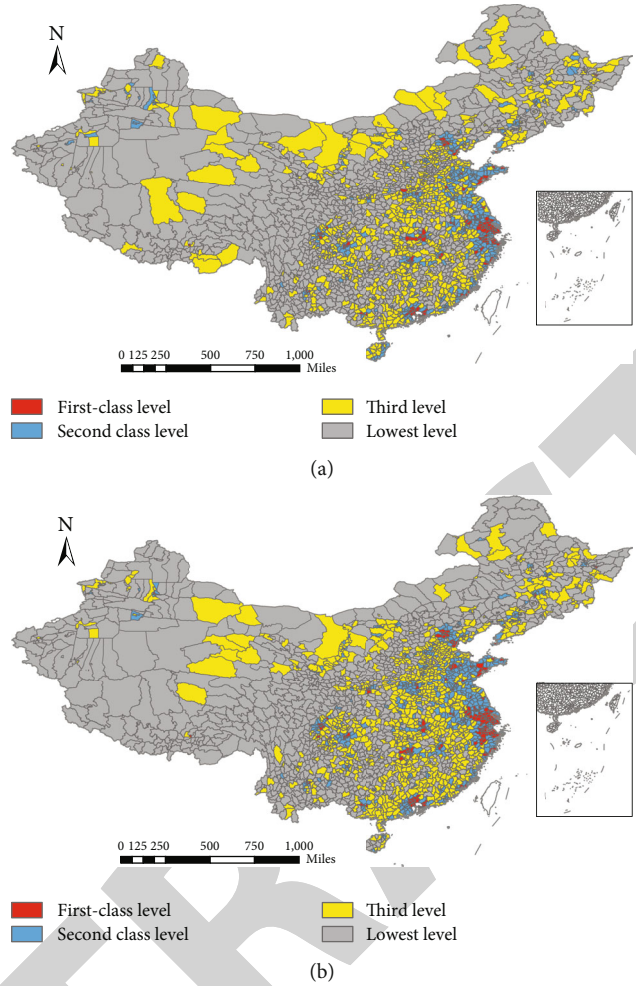

Figure 2: Spatial-temporal evolution of regional development of high quality at county level in 2019-2020. Note: The annual data of 2019 and 2020 are the average data of each month.

similarity tends to disperse; when Z value is 0, interregional similarity tends to randomly distribute [29].

County-level administrative region is the most basic administrative divisions in China, with a large number and wide distribution. Therefore, spatial attributes need to be considered in model testing, which is presented by spatial weight matrix. Considering the spatial spillover effect, the spatial Dubin model was used to analyze the general panel regression by adding spatial attributes. The spatial Dubin model has a good reflection on the spatial correlation of explanatory variables themselves, explanatory variables, and error terms [30]. Considering that high-quality regional development has strong path dependence on time, that is, time lag effect, and endogenous problems caused by two-way causality.In addition, considering that regional development of high quality has a strong path dependence on time, namely time lag effect, And endogenous problems caused by bidirectional causality [31]. Therefore, the explained variable, namely the lagged first-period variable of high-quality comprehensive development index, will be introduced into our research model, which is the standard static space panel Dubin model. In a word, we deal with the possible endogeneity problems in the model from two aspects of method and variable. So we can construct the dynamic space panel Dubin model, as shown below:

$$\begin{aligned} \mathrm{rdhq}_{i,t} = {} & \beta_0 + \beta_1 \mathrm{rdhq}_{i,t-1} + \rho_1 \sum_{i=1}^{n} w_{ij} \mathrm{rdhq}_{jt} \\ & + \beta_2 \mathrm{ins}_{it} + \rho_2 \sum_{i=1}^{n} w_{ij} \mathrm{ins}_{jt} + \beta_3 \mathrm{ie}_{it} \\ & + \rho_3 \sum_{i=1}^{n} w_{ij} \mathrm{ie}_{jt} + \beta_4 \mathrm{is}_{it} + \rho_4 \sum_{i=1}^{n} w_{ij} \mathrm{is}_{jt} \\ & + \delta \sum X_{it} + \lambda \sum_{i=1}^{n} w_{ij} X_{jt} + u_i + \varepsilon_{it}, \end{aligned} \tag{5}$$

$$\begin{aligned} \mathrm{rdhq}_{i,t} = {} & \alpha_0 + \alpha_1 \mathrm{rdhq}_{i,t-1} + \pi_1 \sum_{i=1}^{n} w_{ij} \mathrm{rdhq}_{jt} \\ & + \alpha_2 \mathrm{ins}_{it} + \pi_2 \sum_{i=1}^{n} w_{ij} \mathrm{ins}_{jt} + \alpha_3 \mathrm{ie}_{it} \\ & + \pi_3 \sum_{i=1}^{n} w_{ij} \mathrm{ie}_{jt} + \varphi X_{it} + \pi_4 \sum_{i=1}^{n} w_{ij} X_{jt} \\ & + \upsilon_i + \xi_{it}, \end{aligned} \tag{6}$$

Table 3: Moran's I results of county innovation capacity and regional development of high quality.

Variables	I	$E(I)$	sd (I)	z	p value∗	Variables	I	$E(I)$	sd (I)	z	p value∗
rdhq1	0.113	-0.000	0.001	97.577	$p \le 0.001$	rdhq13	0.114	-0.000	0.001	98.938	$p \le 0.001$
ins1	0.120	-0.000	0.001	103.365	$p \le 0.001$	ins13	0.128	-0.000	0.001	110.871	$p \le 0.001$
ie1	0.048	-0.000	0.001	41.823	$p \le 0.001$	ie13	0.041	-0.000	0.001	40.574	$p \le 0.001$
rdhq2	0.111	-0.000	0.001	96.134	$p \le 0.001$	rdhq14	0.102	-0.000	0.001	88.283	$p \le 0.001$
ins2	0.126	-0.000	0.001	108.452	$p \le 0.001$	ins14	0.132	-0.000	0.001	114.010	$p \le 0.001$
ie2	0.048	-0.000	0.001	41.756	$p \le 0.001$	ie14	0.041	-0.000	0.001	40.382	$p \le 0.001$
rdhq3	0.104	-0.000	0.001	90.047	$p \le 0.001$	rdhq15	0.103	-0.000	0.001	89.215	$p \le 0.001$
ins3	0.127	-0.000	0.001	109.662	$p \le 0.001$	ins15	0.132	-0.000	0.001	114.044	$p \le 0.001$
ie3	0.048	-0.000	0.001	41.992	$p \le 0.001$	ie15	0.039	-0.000	0.001	39.563	$p \le 0.001$
rdhq4	0.103	-0.000	0.001	88.742	$p \le 0.001$	rdhq16	0.099	-0.000	0.001	85.534	$p \le 0.001$
ins4	0.127	-0.000	0.001	109.665	$p \le 0.001$	ins16	0.132	-0.000	0.001	114.394	$p \le 0.001$
ie4	0.048	-0.000	0.001	41.535	$p \le 0.001$	ie16	0.039	-0.000	0.001	39.765	$p \le 0.001$
rdhq5	0.112	-0.000	0.001	96.758	$p \le 0.001$	rdhq17	0.101	-0.000	0.001	87.370	$p \le 0.001$
ins5	0.125	-0.000	0.001	108.313	$p \le 0.001$	ins17	0.133	-0.000	0.001	114.844	$p \le 0.001$
ie5	0.047	-0.000	0.001	41.166	$p \le 0.001$	ie17	0.039	-0.000	0.001	39.267	$p \le 0.001$
rdhq6	0.099	-0.000	0.001	86.024	$p \le 0.001$	rdhq18	0.102	-0.000	0.001	88.377	$p \le 0.001$
ins6	0.125	-0.000	0.001	108.301	$p \le 0.001$	ins18	0.133	-0.000	0.001	114.801	$p \le 0.001$
ie6	0.047	-0.000	0.001	41.060	$p \le 0.001$	ie18	0.038	-0.000	0.001	38.529	$p \le 0.001$
rdhq7	0.104	-0.000	0.001	90.203	$p \le 0.001$	rdhq19	0.102	-0.000	0.001	88.720	$p \le 0.001$
ins7	0.124	-0.000	0.001	107.250	$p \le 0.001$	ins19	0.133	-0.000	0.001	115.094	$p \le 0.001$
ie7	0.047	-0.000	0.001	40.983	$p \le 0.001$	ie19	0.038	-0.000	0.001	38.918	$p \le 0.001$
rdhq8	0.104	-0.000	0.001	89.669	$p \le 0.001$	rdhq20	0.103	-0.000	0.001	89.453	$p \le 0.001$
ins8	0.127	-0.000	0.001	110.136	$p \le 0.001$	ins20	0.134	-0.000	0.001	115.349	$p \le 0.001$
ie8	0.047	-0.000	0.001	40.817	$p \le 0.001$	ie20	0.038	-0.000	0.001	38.715	$p \le 0.001$
rdhq9	0.103	-0.000	0.001	88.971	$p \le 0.001$	rdhq21	0.101	-0.000	0.001	87.391	$p \le 0.001$
ins9	0.127	-0.000	0.001	109.899	$p \le 0.001$	ins21	0.133	-0.000	0.001	115.248	$p \le 0.001$
ie9	0.047	-0.000	0.001	40.574	$p \le 0.001$	ie21	0.039	-0.000	0.001	39.775	$p \le 0.001$
rdhq10	0.112	-0.000	0.001	96.579	$p \le 0.001$	rdhq22	0.102	-0.000	0.001	88.342	$p \le 0.001$
ins10	0.127	-0.000	0.001	110.154	$p \le 0.001$	ins22	0.132	-0.000	0.001	114.399	$p \le 0.001$
ie10	0.046	-0.000	0.001	40.043	$p \le 0.001$	ie22	0.038	-0.000	0.001	38.791	$p \le 0.001$
rdhq11	0.112	-0.000	0.001	96.686	$p \le 0.001$	rdhq23	0.106	-0.000	0.001	91.694	$p \le 0.001$
ins11	0.128	-0.000	0.001	110.184	$p \le 0.001$	ins23	0.132	-0.000	0.001	114.368	$p \le 0.001$
ie11	0.047	-0.000	0.001	41.040	$p \le 0.001$	ie23	0.038	-0.000	0.001	39.070	$p \le 0.001$
rdhq12	0.111	-0.000	0.001	96.022	$p \le 0.001$	rdhq24	0.114	-0.000	0.001	98.566	$p \le 0.001$
ins12	0.128	-0.000	0.001	110.670	$p \le 0.001$	ins24	0.133	-0.000	0.001	115.296	$p \le 0.001$
ie12	0.047	-0.000	0.001	41.184	$p \le 0.001$	ie24	0.038	-0.000	0.001	38.792	$p \le 0.001$

$$\begin{aligned} \mathrm{is}_{i,t} = {} & \eta_0 + \eta_1 \mathrm{is}_{i,t-1} + \theta_1 \sum_{i=1}^{n} w_{ij} \mathrm{is}_{jt} + \eta_2 \mathrm{ins}_{it} \\ & + \theta_2 \sum_{i=1}^{n} w_{ij} \mathrm{ins}_{jt} + \eta_3 \mathrm{ie}_{it} + \theta_3 \sum_{i=1}^{n} w_{ij} \mathrm{ie}_{jt} \\ & + \kappa X_{it} + \theta_4 \sum_{i=1}^{n} w_{ij} X_{jt} + \chi_i + \tau_{it}. \end{aligned} \tag{7}$$

According to the above analysis, the comprehensive index of regional development of high quality ($\mathrm{rdhq}_{i,t}$) is the explained variable, the county innovation ability (ins_{jt}, ie_{it}) is the core explanatory variable, and the industrial structure (is_{it}) is the intermediary variable. Formula (5) is the Formula (3) in the corresponding mediation effect model. Equations (6) and (7) correspond to Equations (1) and (2). In order to further control possible endogeneity

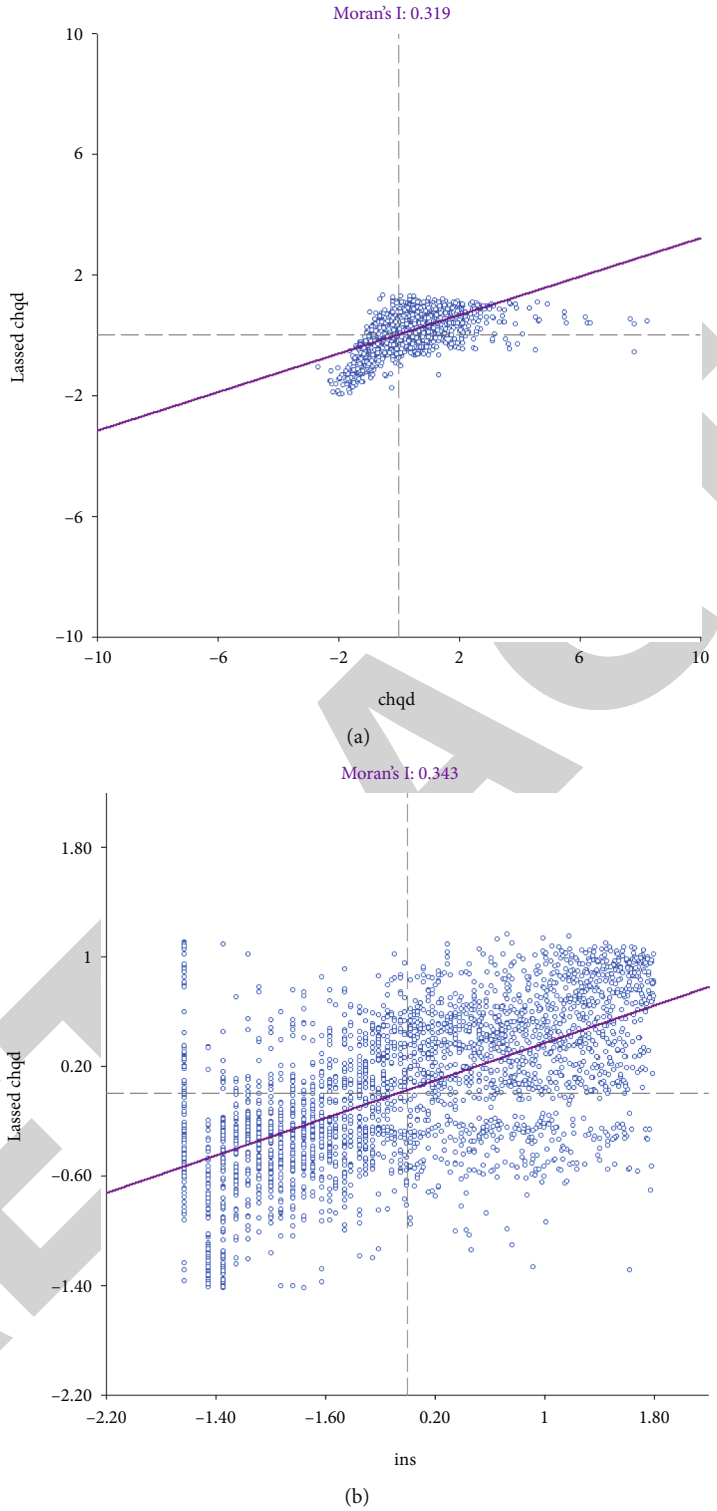

Figure 3: Moran's *I* scatter diagram of county innovation capacity and regional development of high quality. Note: Due to the limitation of the length chart, only the calculation results in December 2020 are given, and the calculation results in other periods are similar.

problems, all explanatory variables are empirically analyzed using data of one period behind. In addition, in model testing, we adopt natural logarithm for variable data measured by nonpercentage indexes to reduce the dispersion degree of sample data.

3.3. Data Sources and Estimation Methods. The data used in our analysis are divided into dynamic data and static data. The static data comes from China county-level statistical yearbook, and the dynamic data is obtained by crawler. In this way, the monthly data of 2847 county-level

Table 4: Estimated results of county innovation capacity, industrial results, and regional development of high quality.

Variable	Nonspace OLS	Nonspatial normal panel model (FE)	Nonspatial dynamic panel model (SYS-GMM)	Dubin model of static space (GSPA2SLS)	Dubin model of dynamic space panel (Han-Phillips GMM)
	Model 1	Model 2	Model 3	Model 4	Model 5
L.rdhq			0.907 (440.87)∗∗∗		0.827 (329.71)∗∗∗
ins	0.370 (98.21)∗∗∗	-0.034 (7.15)∗∗∗	0.032 (27.67)∗∗∗	0.327 (89.46)∗∗∗	0.076 (42.95)∗∗∗
ie	1.391 (8.72)	-0.074 (0.36)	0.037 (2.22)∗∗	0.966 (7.05)∗∗∗	0.094 (5.84)∗∗∗
is	0.412 (13.63)∗∗∗	0.160 (4.44)∗∗∗	0.101 (3.35)∗∗∗	0.256 (8.94)∗∗∗	0.205 (6.72)∗∗∗
ly	15.233 (30.37)∗∗∗	11.310 (4.66)∗∗∗	1.744 (17.63)∗∗∗	21.988 (39.92)	4.694 (30.37)∗∗∗
ur	0.227 (41.96)∗∗∗	-0.009 (0.18)	0.017 (12.89)∗∗∗	0.191 (36.92)	0.026 (15.99)∗∗∗
ltp	0.687 (25.96)∗∗∗	-0.101 (2.60)∗∗∗	0.067 (9.71)∗∗∗	0.746 (29.38)∗∗∗	0.182 (20.99)∗∗∗
wl	0.280 (18.55)∗∗∗	0.114 (3.44)∗∗∗	0.035 (9.21)∗∗∗	0.325 (21.25)∗∗∗	0.040 (7.58)∗∗∗
lop	1.195 (23.63)∗∗∗	-0.518 (4.49)∗∗∗	0.278 (21.68)∗∗∗	1.320 (23.68)∗∗∗	0.352 (19.35)∗∗∗
ps	0.131 (13.22)∗∗∗	0.085 (4.97)∗∗∗	-0.018 (7.57)∗∗∗	0.117 (11.84)∗∗∗	0.051 (18.01)∗∗∗
pg	6.993 (39.27)∗∗∗	5.730 (11.76)∗∗∗	0.678 (20.04)∗∗∗	6.128 (36.19)∗∗∗	1.040 (28.87)∗∗∗
w.rdhq				1.599 (67.58)∗∗∗	0.481 (67.75)∗∗∗
w.ins				-0.455 (7.62)∗∗∗	-0.793 (26.89)∗∗∗
w.ie				0.054 (1.43)	0.321 (14.75)∗∗∗
w.is				10.767 (17.98)∗	-0.167 (181.73)∗∗∗
_cons	-166.055 (83.35)∗∗∗	-80.044 (12.04)∗∗∗	-18.340 (25.16)∗∗∗	-177.587 (90.58)∗∗∗	-30.658 (35.32)∗∗∗
R^2	0.7013	0.3755		0.7402	
N	66264	66264	63503	66264	
F (Wald) [p]	7503.14 [≤0.001]	34.50 [≤0.001]	2119.52 [≤0.001]	121.28 [≤0.001]	139.91 [≤0.001]
AR (1) [p]			-11.68 [≤0.001]		-11.36 [≤0.001]
AR (2) [p]			5.96 [≤0.001]		9.95 [≤0.001]
Sargan [p]			261.98 [≤0.001]		199.53 [≤0.001]

Note: the T value or Z value is shown in parentheses, and the values in brackets are concomitant probability. ∗∗∗, ∗∗, and ∗ represent the significance level of 1%, 5%, and 10%, respectively. The spatial dynamic panel model reported the Wald test, same as the nonspatial dynamic panel model (SYS-GMM). And the rest of the other models reported the F-test. Due to space limitation, the estimation results of spatial lag coefficient of each control variable are not given. The following table is the same.

administrative regions in China for a total of 24 months from January 2019 to December 2020 were obtained. Some missing data were filled by multiple interpolation method. Refer to the Han-Phillips generalized method of moments (GMM) estimation proposed by Han and Phillips [32]. At the same time to facilitate comparison, also report the traditional nonspatial OLS, than fixed effect panel, the nonspatial dynamic panel model of generalized moment estimation results, and the estimation results of generalized spatial panel autoregression two-stage least squares (GSPA2SLS) for static spatial panel model.

4. The Empirical Test

4.1. Time and Space Dynamic Evolution Characteristics of County Regional Development of High Quality. In order to directly reflect the spatiotemporal evolution characteristics of high-quality county development in China in 2019-2020, the above calculation results were plotted by Arcgis10.7 software and classified by natural breakpoint classification method. The results are shown in Figure 2, from which the following characteristics can be seen: (1) the development of Chinese county high-quality distribution in general "Hu Huanyong Line" as the boundary presents the east-west less, especially focused on the coastal area; this is because the coast itself has better economic foundation, attaches great importance to science and technology innovation investment, and optimizes and upgrades the industrial structure and the strengthening of environmental protection and social welfare level, more conducive to the development of high quality; (2) in cluster distribution, the regional development of high-quality distribution of county areas is mainly the Beijing-Tianjin-Hebei region, Shandong Peninsula, Yangtze River Delta, Pearl River Delta, and Chengdu-Chongqing region as several obvious polar cores and the continuous and flake distribution as the center; (3) the agglomeration trend is further strengthened. According to the annual comparison, it is getting smaller regional development of high-quality areas (cities) and counties in the southwest, northwest, and northeast regions. And the number of regional development of high-quality areas (cities) and counties in the Pearl River Delta, Yangtze River Delta,

Table 5: Regression estimation results of county innovation capacity on regional development of high quality.

Variable	Nonspace OLS	Nonspatial normal panel model (FE)	Nonspatial dynamic panel model (SYS-GMM)	Dubin model of static space (GSPA2SLS)	Dubin model of dynamic space panel (Han-Phillips GMM)
	Model 6	Model 7	Model 8	Model 9	Model 10
L.rdhq			0.819 (50.00)***		0.809 (317.72)***
L.is					
ins	0.369 (98.38)***	-0.037 (7.66)***	0.068 (8.63)***	0.322 (89.54)***	0.082 (43.87)***
ie	1.442 (8.69)***	-0.051 (0.23)	-0.058 (0.92)	-0.988 (6.97)***	0.144 (8.98)***
ly	16.132 (32.10)***	14.682 (5.93)***	3.512 (7.60)***	23.126 (41.51)***	4.960 (32.07)***
ur	0.222 (40.78)***	-0.008 (0.16)	0.040 (6.62)***	0.192 (36.97)***	0.031 (19.24)***
ltp	0.684 (25.69)***	-0.112 (2.85)***	0.129 (5.76)***	0.763 (29.68)***	0.221 (25.46)***
wl	0.267 (17.66)***	0.115 (3.39)***	0.056 (4.81)***	0.311 (20.31)***	0.040 (7.38)***
lop	1.262 (24.64)***	-0.528 (4.57)***	0.391 (8.75)***	1.344 (23.89)***	0.447 (23.14)***
ps	0.166 (16.71)***	0.091 (4.90)***	0.009 (1.25)	0.150 (15.80)***	0.066 (23.14)***
pg	6.531 (38.85)***	5.311 (11.71)***	1.052 (6.80)***	5.477 (62.61)***	1.048 (30.01)***
w.rdhq				1.463 (65.78)***	0.510 (72.76)***
w.ins				-0.514 (8.98)***	-0.924 (29.41)***
w.ie				0.188 (5.82)***	0.611 (35.84)***
_cons	-152.641 (86.47)***	-76.034 (11.08)***	-28.334 (11.43)***	-162.415 (95.29)***	-26.642 (40.14)***
	66264		63503	66264	63503
F (Wald) [p]	936.70 [≤0.001]	33.77 [≤0.001]	135.48 [≤0.001]	114.42 [≤0.001]	169.91 [≤0.001]
AR (1) [p]			-23.71 [≤0.001]		-114.90 [≤0.001]
AR (2) [p]			4.32 [≤0.001]		10.26 [≤0.001]
Sargan [p]			223.58 [≤0.001]		197.83 [≤0.001]

Chengdu-Chongqing, and Central Plains Urban Agglomerations is obviously increasing.

4.2. Spatial Autocorrelation Analysis. According to Formula (4), the global Moran's I results and test values of China's county innovation capacity and regional development of high quality are calculated, as shown in Table 3:

Some conclusions can be drawn from Table 3, like that Moran's I in each period is significantly greater than zero, which means that there is an obvious positive spatial correlation between county innovation ability and regional development of high quality. By calculating local Moran's I and plotting the Moran's I scatter diagram of county innovation ability and regional development of high quality, the results are shown in Figure 3:

The results in Figure 3 show the scatter diagram between county innovation capacity and regional development of high quality; among them the first quadrant is H-H type (high-high) region, the second quadrant is L-H type (low-high) region, the third quadrant is L-L type (low-low) region, and the fourth quadrant is H-L type (high-low) region [33]. Among them, different counties have different correlation characteristics. On the whole, there is an obvious spatial autocorrelation between innovation capability and regional development of high quality at county level in China. Therefore, if such spatial correlation is ignored in the empirical process, there will be regression bias [34].

4.3. The Impact of County Innovation Capability and Industrial Structure on Regional Development of High Quality. Before constructing the spatial econometric model, it is necessary to construct the spatial weight matrix to reflect the spatial correlation between regions. The appropriate spatial weight matrix has an important influence on the empirical results. Spatial weight matrix is commonly used in existing research, including geographic relating right weight matrix, inverse distance weighting matrix, economic weight matrix, and nested weight matrix [35], because the county innovation is related to the input and output aspects of systemic economic activity, not only need to consider geographical factors when considering the spatial correlation; therefore, according to existing studies [36], the nested matrix is used to construct the spatial econometric model, in which the geographical distance spatial weight matrix (W_{ij}^{g}) is constructed by the inverse ratio of the great circle distance method, as shown in

$$W_{ij}^{g} = \begin{cases} \frac{1}{d_{ij}}, i \neq j, \\ 0, i = j. \end{cases} \tag{8}$$

Table 6: Estimated results of mediation effect between innovation capability and industrial outcome at county level.

Variable	Nonspace OLS	Nonspatial normal panel model (FE)	Nonspatial dynamic panel model (SYS-GMM)	Dubin model of static space (GSPA2SLS)	Dubin model of dynamic space panel (Han-Phillips GMM)
	Model 11	Model 12	Model 13	Model 14	Model 15
L.is			0.898 (295.21)***		0.758 (321.52)***
ins	-0.258 (53.92)***	-0.234 (16.12)***	-0.039 (15.30)***	-0.263 (54.81)***	0.224 (44.12)***
ie	0.941 (18.20)***	2.015 (2.21)**	0.157 (3.60)***	1.044 (14.28)***	0.492 (11.33)***
ly	10.848 (18.50)***	316.418 (28.60)***	2.082 (6.04)***	7.158 (12.18)***	-3.807 (7.27)***
ur	0.007 (0.96)	0.299 (2.51)**	0.003 (0.73)	0.038 (5.35)***	0.089 (17.21)***
ltp	-0.041 (1.03)	-0.768 (4.75)***	-0.022 (1.07)	0.073 (1.88)*	0.120 (5.00)***
wl	-0.068 (2.83)***	-0.054 (0.39)	-0.016 (1.41)	0.011 (0.48)	0.451 (26.33)***
lop	2.452 (33.91)***	1.090 (2.07)**	0.308 (8.81)***	0.725 (10.01)***	0.179 (3.33)***
ps	0.748 (59.45)***	0.462 (6.73)***	0.125 (14.36)***	1.013 (84.13)***	0.398 (36.35)***
pg	-5.078 (27.19)***	-11.760 (7.43)***	-1.238 (8.41)***	-5.985 (34.69)***	-3.675 (35.65)***
w.ins				0.529 (8.32)***	-1.231 (11.45)***
w.ie				0.282 (6.18)	1.728 (23.21)***
w.is				1.328 (53.95)	1.427 (58.00)***
_cons	81.172 (39.92)***	-210.341 (8.76)***	15.529 (11.39)***	95.505 (50.60)***	-0.053 (0.04)
	66264	66264	63503	66264	63503
F (Wald) [p]	139.69 [≤0.001]	200.88 [≤0.001]	1584.19 [≤0.001]	324.84 [≤0.001]	162.99 [≤0.001]
AR (1) [p]			-35.95 [≤0.001]		-113.58 [≤0.001]
AR (2) [p]			10.50 [≤0.001]		11.15 [≤0.001]
Sargan [p]			168.33 [≤0.001]		624.45 [≤0.001]

Among Formula (8) d_{ij} is the great circle distance between district (city) county I and district (city) county J, which can be obtained by latitude and longitude calculation. The spatial weight matrix of economic distance (W_{ij}^{e}) is constructed by selecting the per capita GDP of each district (city) and county as the matrix element, as shown in

$$W_{ij}^{e} = W_{ij}^{g}\,\mathrm{diag}\left(\frac{\overline{Y_1}}{\bar{Y}}, \frac{\overline{Y_2}}{\bar{Y}}, \cdots\cdots \frac{\overline{Y_n}}{\bar{Y}}\right); W'^{e}_{ij} = \begin{cases} \dfrac{W_{ij}^{e}}{\sum_j W_{ij}^{e}}, i \neq j, \\ 0, i = j. \end{cases} \tag{9}$$

Among Formula (9) $\overline{Y_j}$ is the average GDP per capita of region (city) and county (I) during the observation period, and $\bar{Y}$ is the average GDP per capita during the total observation period. The advantage of using nested matrices is that both geographical distance and economic ties are considered. Dynamic panel spatial Dubin model is used to regression county innovation capacity, industrial structure, and regional development of high quality, and the results are shown in Table 4:

It can be seen from Table 4 that the time lag term (L.rdhq) and spatial lag term (w.rdhq) coefficients of regional development of high quality are significantly nonzero (at the significance level of 1%), indicating that the time and spatial correlation should be fully considered in the regression analysis; that is, it is reasonable to use the dynamic spatial panel model. By comparing the regression coefficients of exogenous variables in all models, it can be seen that if the spatial correlation between districts (cities) and counties is ignored, the impact of each factor on regional development of high quality will be overestimated. Compared with model 1 and model 2, it was found that the regression coefficient of innovation environment (ie) did not pass the significance test due to traditional OLS estimation. The spatial lag term of each explanatory variable was added into model 4, and it was found that the spatial lag term of per capita income (ly), urbanization level (ur), and innovation environment (w.i) were not significant. The regression coefficient of the explanatory variable for the first-order lag term of model 5 is positive, indicating that the county has strong inertia. The high-quality core innovation subjects (INS), environmental variables (ie) and industrial structure (is) of regional development are all significant positive regression coefficients. It shows that the county's innovation ability, innovation ability and innovation ability play a positive role in the upgrading of the county's industrial structure and high-quality development.

From the perspective of spatial lag term coefficient, the spatial lag term coefficient of regional development of high quality (w.rdhq) and innovation subject (w.ins) will be overestimated in model 4 without the first-order lag term of explained variables, and the regression coefficient of innovation environment (w.ie) is not significant. Comprehensive view model 5 county regional development of high quality has significant time lag effect and spatial spillover effect; on

the one hand, the county regional development of high quality is a systematic, structural system of comprehensive, from volume expansion to structural optimization, with the inheritance of inertia and time stability of the economic operation [37]. On the other hand, regional development of high quality at the county level needs to focus on the integration of industry and city to promote the effective connection between urban functions and industrial development. In this process, cities and towns become more attractive to the population, which will promote the overall urbanization and industrialization process of the region [38].

4.4. Study on the Intermediary Effect of Industrial Structure. Based on the above analysis, the mediating effect of industrial structure on county innovation capacity and regional development of high quality was investigated, and regression analysis was conducted according to Formulas (1) and (6). The results are shown in Table 5:

As can be seen from Table 5, the regression coefficient of innovation subject (ins) and innovation environment (ie) of the core explanatory variables on the quality development of the explained variable (rdhq) is significantly not zero, suggesting that there is a mediation effect at this time. Combined with (2) and (7), the regression analysis is conducted, and the results are shown in Table 6:

It can be seen from Table 6 that the regression coefficient of the core explanatory variables innovation subject (ins) and innovation environment (ie) on the explained variable industrial structure (is) is significantly not zero. Combined with the results of Table 4, it is believed that the mediation effect of industrial structure exists, and there are both direct effect and indirect effect, namely, partial mediation effect. The estimated results of model 15 are consistent with the previous theoretical expectations. The change of the main social contradiction reflects the transformation from the total contradiction of supply and demand system to the structural contradiction. The basis for promoting structural changes in economic and social operation lies in the expansion of reproduction of the knowledge middle class, the promotion of advanced internal industrial structure through the improvement of employment capacity and the upgrading of consumption structure, and the realization of leap-forward growth and regional development of high quality led by knowledge-intensive industries [39].

5. Conclusion

After the victory in poverty alleviation, rural revitalization should be comprehensively promoted. The key battlefield of Rural Revitalization is the county, and the high-quality development of the county is the key to rural revitalization. This paper takes 2847 county-level administrative units of data as an example, based on the dynamic panel Dubin model, the mediation effect model, and the empirical analysis methods, such as the county innovation ability and the inspection between industrial structure and regional development of high quality. It is found that county innovation is the key factor affecting high-quality development, and industrial structure upgrading plays a mediating role, so it is necessary to pay attention to county-level industrial structure adjustment to promote high-quality development. The main conclusions are as follows:

(1) The regional development of high quality at county level in China generally shows a cluster distribution, and the agglomeration tends to be further enhanced. Innovation capability and industrial structure have a significant positive impact on the regional development of high quality at county level. "The seventh census" data to see the future population continue to eastern provinces and center has changed the trend of the urban agglomeration. And the 19th congress points out that the role of the county economy in the future will be more and more obvious. The innovation ability is the key to improve the county, which will promote the fundamentals of the industrial structure

(2) Innovation has both direct and indirect effects on regional development of high quality. When the people is going into the knowledge economy society, the innovation to promote the development of high quality has a decisive role. On the one hand, the human society has entered a knowledge-based economy society, and the change of social development stage requires the economic structure to change from simple copying and imitation to innovation leading. A high level of scientific research and subvert technology breaks through promoting the commercialization and industrialization of scientific and technological achievements, promoting the establishment of knowledge-intensive and high-value-added industries; the endogenous power of knowledge to economic growth has become more and more obvious, and knowledge groups have become the main groups to create wealth and economic benefits, and their expansion of reproduction promotes the upgrading of consumption structure, such as the increase in the proportion of spending on science, education, culture, and health, which is conducive to the accumulation of human capital and the improvement of the quality of labor force, and promotes the advanced process within the industrial structure

(3) Industrial structure upgrade has intermediary effect. It has strong space-time-dependent effects with regional development of high quality. On the one hand, the industrial structure has strong path-dependent characteristics and inheritance inertia in time dimension with regional development of high quality. And the current industrial structure and regional development of high-quality characteristics will inherit and retain the characteristics of the previous period to a large extent. There is also a significant spillover effect in space, which is not only driven by synergy under the model's typical demonstration, but also driven by competition under the "political tournament".

Data Availability

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

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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