

Analysis of Cultivated Land Area and Urbanization Rate Based on Spatial Coordination

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Abstract: The study of the regional effects of urban competitiveness on housing prices and their impact is of great significance to real estate market operations, consumer purchases and government decision-making. This study takes 32 major cities as research samples, draws on the more mature urban competitiveness index system, selects 8 representative factors, collects panel data such as statistical yearbook, and uses principal component analysis regression equation to establish the influence of urban competitiveness on housing price. The model analyzes the extent to which major competitiveness factors affect housing prices. The results show that: 1 The regional GDP and the balance of household savings play a more important role in the change of housing prices. The impact of environmental factors on housing prices is gradually expanding. The impact of urban real estate development investment on housing prices is getting smaller and smaller. The tertiary industry creates comfort for urban life and has a greater impact on housing prices. The total population at the end of the year and the number of students in colleges and universities have a negative impact on housing prices; the total population at the end of the year, the completion of real estate development investment, and the proportion of the tertiary industry have a greater impact on housing prices in the eastern region; Factors such as economic fundamentals have a greater impact.

Keywords: Urban competitiveness, Housing prices, Influencing factors, Empirical research.

1. Introduction

Cultivated land resources are the material basis for human survival and development, and are irreplaceable natural resources and strategic reserves to maintain the function of natural ecosystems and support the development of social and economic systems. The total amount of cultivated land resources in China is rich, but the per capita occupancy is small, and the potential for the development of reserve cultivated land resources is small. In addition, with the rapid development of urbanization in recent years, the proportion of urban population has increased year by year, and a large number of cultivated land resources have been transferred from the agricultural sector to the non-agricultural sector, reducing the area of cultivated land and the quality of cultivated land. With the development of urbanization and the increase of non-agricultural population, people's demand for food and other crops is growing. Blindly protecting the arable land will definitely drag down the regional economic growth, and the economic and industrial restructuring will be far away. But blindly developing economy will worsen cultivated land resources and affect regional food security. Therefore, it is of great significance to study the coordination between the area of cultivated land resources and the urbanization rate, so as to make the protection of cultivated land resources and economic development coordinate.

At present, most scholars only analyze and elaborate the relationship between cultivated land resources and urbanization development from the theoretical perspective, lacking corresponding empirical analysis. At the same time, the description of the relationship between the two is more qualitative analysis than quantitative analysis. Therefore, this study establishes the quantitative relationship between urbanization and cultivated land area with the aid of the coupling coordination degree model, and uses the spatial relationship between the global spatial autocorrelation tool coordination degree to try to find the internal relationship

between urbanization development and cultivated land resources, and continue to explore its regularity and operating mechanism. It is of great significance to coordinate the protection of cultivated land resources and economic development.

2. Research Area and Data Source

In this study, five provinces in northwest China (Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang) are taken as the study area. According to the social and economic development of northwest China, the urbanization rate and cultivated land area in 2000, 2008 and 2014 are taken as panel data. The data of urbanization rate comes from the China Statistical Yearbook 2001-2015, and the data of cultivated land area comes from the revised data of the first and second national land surveys

3. Research Methods

3.1. Establishment of co scheduling model between urbanization rate and cultivated land area

Based on the existing coordination degree model, this paper establishes the coordination degree model of urbanization rate and cultivated land area:

$$C_{xy} = (x+y) / (x^2+y^2)^{0.5}$$

X is the improvement rate of urbanization level, y is the change rate of cultivated land area, and C is the coordination degree between urbanization level and cultivated land area. The value range of C is [-1.414, 1.414]. Among them, $1.2 \leq C_{xy} \leq 1.414$, the relationship between the two is very harmonious; $1 \leq C_{xy} < 1.2$, Represents the basic coordination between the two; $0.5 \leq C_{xy} < 1$, The relationship between the two is very harmonious in the short term; $0 \leq C_{xy} < 0.5$, Represents short-term basic coordination- $1.414 \leq C_{xy} < 0$, which means incongruity.

3.2. Coordinated spatial autocorrelation test

The global spatial autocorrelation measures the spatial difference and correlation degree between regions as a whole by comparing the characteristics of the cooperative scheduling in different spatial locations. The specific expression is as follows:

$$\text{Moran's } sI = \frac{N}{\sum_{i=1}^N \sum_{j=1}^N W(i, j)} \times \frac{\sum_{i=1}^N \sum_{j=1}^N W(i, j) (X_i - \bar{X}) (X_j - \bar{X})}{\sum_{i=1}^N (X_i - \bar{X})^2}$$

X_i Is the observed value, \bar{X} is X_i average. $W(i, j)$ represent spatial relationship.

3.3. Regional differences in the impact of urban competitiveness on housing prices

It can be seen from Table 6 that most indicators of urban competitiveness have a significant positive effect on housing prices, and the regional differences in the degree of effect are obvious. (1) At the end of the year, the total population had the greatest impact on housing prices in the eastern region, while it had less impact on the western region, indicating that urban population changes in the eastern region were more likely to affect housing price changes; (2) The impact of GDP on housing prices in different regions is not very different, which indicates that GDP, as an economic fundamental factor, has an obvious and important impact on housing prices; (3) The completed amount of real estate development investment in the eastern region has a greater impact on housing prices, while the impact in the central and western regions is relatively small. The construction land resources in the eastern region are tight, and the change of real estate development investment is more likely to affect urban housing prices; (4) The per capita road area in the central and western regions shows a positive effect, while in the eastern

regions it shows a negative correlation, which means that the regions with higher per capita road area in the eastern regions are more likely to be located in areas with lower urban population and traffic intensity, and high-speed rail, aircraft and other transportation tools are more convenient, so high housing prices are concentrated in prosperous regions. With the improvement of traffic conditions in the central and western regions, housing prices will rise accordingly; (5) The increase of per capita green area in the east and west will affect the growth of housing prices, while the higher the per capita green area in the central region, the lower the housing prices, which may be due to the relatively good environment in the central region; (6) The proportion of the tertiary industry in the eastern region has the greatest impact, followed by the central region. The more the tertiary industry in the western region is, the lower the house price is. The eastern and central regions have a high level of economic development. The development of the tertiary industry will promote the convenience and comfort of urban life, but also provide a lot of employment opportunities and improve the speed of economic development. In the western region, the primary and secondary industries are still focused on; (7) The number of students in colleges and universities is negatively correlated in the eastern and central regions, and positively correlated in the western regions. This shows that the improvement of education level in the western region is conducive to the promotion of housing prices, while this has been more full in the eastern and central regions, and even other situations have occurred; (8) The year-end balance of household savings is positively correlated in the east and west, and negatively correlated in the west. This shows that the growth of residents' disposable income in the western region will not promote the growth of housing prices, and even has a restraining effect. Most indicators of urban competitiveness have significant positive effects on housing prices, and there are regional differences in their effects in different regions.

Table 1. Impact of urban competitiveness on housing prices

Explanatory variable	Full sample	East	Central section	West
Total Population	-2.044***	-8.855***	-2.496***	-1.333***
GDP	0.0000547***	0.000048***	-5.50e-06**	0.0000377**
Completed amount of real estate development investment	0.0000406**	0.0001873***	0.0000565**	9.06e-07*
Per capita road area	27.457**	-56.661**	84.214***	19.564**
Green area per capita	10.531***	10.885***	-43.899***	10.550***
Proportion of tertiary industry	44.090***	60.614***	21.431*	9.544**
Number of students in ordinary colleges and universities	-13.747**	-65.188*	-1.023***	37.354*
Year end balance of residents' savings	0.0000109**	5.26e-6***	0.0000511***	-0.000016***

4. Conclusions and Suggestions

4.1. Conclusions

This paper uses the principal component regression analysis method to study the impact mechanism and degree of the nine variables of urban competitiveness on housing prices, using the relatively mature urban competitiveness index system for reference.

As the main indicators of economic fundamentals, GDP and residents' savings balance play an important role in the change of housing prices. The economic level of a city determines the housing price. The per capita green space area

and per capita road area represent the advantages and disadvantages of urban environment and traffic convenience, especially the impact of environmental factors on housing prices is gradually expanding. The proportion of the tertiary industry has a great impact. The adjustment of the industrial structure provides a lot of employment opportunities, while creating a comfortable and fast urban life, providing more convenience for urban living groups. The impact of the completed amount of urban real estate development investment on the housing price is getting smaller and smaller, mainly due to the serious malicious speculation and speculation in the investment market at present, and the improvement of the relevant national policies, which makes

its impact on the housing price smaller and smaller. Due to the intensification of urbanization, population mobility and the strengthening of education popularization, the total population of the city at the end of the year and the number of college students present a negative impact; The total population of eastern cities at the end of the year, the completed amount of real estate development investment, the proportion of the tertiary industry and other factors have a greater impact on housing prices, which also shows that the economic level of eastern cities is relatively developed, and the investment in the tertiary industry has become the key point to stimulate housing price growth. However, the central and western regions are still greatly affected by transportation, economic fundamentals and other factors.

4.2. Suggestions

GDP and household savings have a greater impact on housing prices. Therefore, the future urban economic construction, especially in the central and western regions, should still be in a key position. The eastern, central and western regions all need strong economic support, improve citizens' economic level and consumption ability, and establish a more stable and dynamic real estate consumption market; The development of the tertiary industry in the eastern and central regions has a great impact on housing prices. We should actively adjust the industrial structure and pay attention to the strong power of the tertiary industry. The western region still needs to focus on the development of the primary and secondary industries, consolidate the economic chassis, and improve the industrial imbalance. While the city is vigorously developing its economy, more attention should be paid to the protection of urban life and living environment. There is still room for high-speed rail development in central and western cities, and the public transport facilities in cities are insufficient. Therefore, in the process of urban construction, we should vigorously develop rail transit, public transport facilities, and improve road facilities

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