The Impact of Urban Villages on House Prices: Empirical Research of Hangzhou

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Abstract: The urban village as a unique product of the process of urbanization in the emergence of many aspects of the city have caused some impact. Based on 2015 second-hand housing transaction data in Hangzhou's main area, this paper constructs a hedonic model to quantitatively analyze the impact of urban villages on housing prices. The empirical results show that the existence of the village in the city will have a negative impact on housing prices, and the closer the community is to the village in the city, the greater the negative impact. In addition, the size of the village in the city and the progress of them will also have a certain impact on housing prices.

1. Introduction

In China, with the continuous advancement of urbanization and the expansion of urban construction land, cultivated land or collective land that was originally in rural areas was continuously requisitioned, and rural settlements gradually surrounded by urban built-up areas. These aspects are very different from those of urban residents, which has formed China's unique "urban village" phenomenon.

Today, the scale of urban villages in large and medium cities across the country is still huge. Since urban village is essentially a gap between the cities, this characteristic will inevitably bring about a series of social problems such as cluttered populations, severe public security forms, inadequate infrastructure, poor sanitation, and urban land use. These problems will affect the surrounding areas. The environment creates negative externalities, and the removal or transformation of these urban villages may eliminate this negative externality. At present, the relocation and reconstruction of urban villages have been carried out to varying degrees in these cities.

The purpose of this paper is to take Hangzhou as an example. Based on the five-year attack on the reconstruction of urban villages, the 2015 second-hand housing transaction data in Hangzhou's main urban area was used to construct a hedonic model. Empirical estimates the impact of urban villages on surrounding second-hand housing prices. The structure of this paper is as follows: the second part introduces the research related to the village in the city and its reconstruction; the third part explains the data source and the setting of the model; the fourth part analyzes the empirical results; the fifth part draws the conclusion.

2. Literature review

The village in the city is a common phenomenon that has emerged in the process of rapid urbanization in China since the reform and opening up. This phenomenon has been bred, formed, and manifested a process that is closely related to China's urban development process and changes in urban-rural relations. In fact, the research on urban villages in China has not been carried out for a long time, and each scholar will give different definitions to urban villages. Zhang defined in his doctoral dissertation the village in the city as being located on the fringe of urban and rural areas [1]. On the one hand, it has certain characteristics of the city, and also enjoys certain urban infrastructure and lifestyles. Landscape, and rural communities with smallholder economic ideas and values.

Many scholars have done research on the impact of urban villages on the residential market. Ioannides believes that the characteristics of the perimeter of the house will affect consumers' willingness to pay [2,3]. Bai Peng explored the impact of villages in the city on the regular housing market by establishing hedonic model, and conducted a questionnaire survey to explore how villages in the city affect residential prices [4]. It was found that the influence of villages in the city on urban residents was both negative and positive, it puts forward various aspects that should be considered in the reconstruction of the village in the city. Song and Zenou researched the Nanshan District of Shenzhen City and found that the impact of the village in the city on house prices is negative [5]. Also, the larger the size of villages, housing prices fell from near the village caused by the extent of the more and more. Zhang used Beijing as a research object and used the hedonic model to analyze the spillover effect of urban village renovation on nearby house prices [6]. The results show that the existence of the village in the city will cause a 2.5% discount on the nearby house price. Chen conducted a comparatively macroscopic study of Hanyang District of Wuhan City, and concluded that the impact of the village reconstruction on the real estate market supply has increased the supply of residential land and commercial housing and increased the balance of the real estate market supply structure. The impact of urban village renovation on housing prices will mainly increase housing prices in the local market [7].

Based on the research of these scholars, it can be seen that the village in the city will have a negative impact on housing prices, but the effect may be different in different cities. Hangzhou selected for the study, by collecting the main city of Hangzhou district second-hand housing transaction data and villages of the relevant data, using traditional hedonic model to research the impact of villages on housing prices.

3. Data

Table 1 Description of residential characteristic variables

Feature classification	Feature name	Specific meaning	Anticipation symbol
Architectural features	housing area(are)	Actual housing sales area, unit:m^2	+
	floor(flo)	Floor where the house is actually located	unkown
	age	Time interval from residential building to sales, unit: year	—
Neighborhood features	transportation(tra)	Using the scoring method, 5-1	+
	living support(liv)	Using the scoring method, 5-1	+
	education(edu)	Using the scoring method, 4-1	+
Location characteristics	Qiantangjiang(qtj)	The closest straight distance from the center of the community to the Qiantang River, unit: km	—
Urban village	nearby(nea)	Virtual variable,if there is a village in the city within 1km of the neighborhood , the value is 1 ; otherwise, the value is 0	—
	distance(dis)	Distance from the community center to the nearest urban village, unit: km	+
	size(siz)	The size of the village in the city closest to the community	—
	progress(pro)	Virtual variable	+

This article selects six main urban areas of Hangzhou, and obtains residential transaction data. Villages of relevant information comes from the Zhejiang Hangzhou government service

network construction network. Acquiring 556 plots 18737 dwellings transaction sample data, in order to eliminate the analysis errors caused by this kind of village in the city, this article removes some villages in the city from the 178 villages to be studied. The actual analysis object is 37 villages. This article takes the total price of a single house as the explanatory variable, the meaning and quantification of the variables are described in the table 1.

In table 1, the housing area, floor, Building age , Qiantang River from villages in the distance using the actual measurement data, transportation, living support, education facilities using comprehensive evaluation to determine the scoring method, neighboring villages virtual variable form, according to village-scale reconstruction of the village's households to measure , city reconstruction progress has been transformed score according to the number of households and the overall transformation of the number of households into two categories.

4. Model Setting

This article will use the hedonic model to study the influence of the village in the city on the surrounding house prices. The hedonic model is one of the most commonly methods for domestic and foreign scholars to study house prices. The main advantage is that it only needs certain information, such as house prices, residential characteristics, and appropriate functional relationships, to estimate the target variable's effect on the value of the function impact [8]. The model can represent a house price as a function of various features:

$$P = f(X_1, X_2, \ldots, X_n) \qquad (1)$$

Among them, P is the price of the house, X_i represents the characteristics of the house (housing area, floor, age of the house, convenient transportation, living facilities, education facilities, Qiantang River distance, urban village, urban village distance, urban village size, urban village reconstruction progress). There are three main functional forms in the hedonic model: linear form, log form, and log-linear form. In the study of this article, the logarithmic form of housing price is used as the dependent variable. The distances from the independent variable to the nearest urban village, the age of the house, and the distance to the West Lake are positive and continuous. The logarithmic form is used. Discrete variables such as convenient transportation and educational facilities are in linear form, and the basic function form is:

$$ln\,P = c + \sum \beta_i\,Y_i + \sum \alpha_i\,Z_i + \varepsilon \qquad (2)$$

P is a single set of second-hand housing transaction price, Y_i is the relevant villages of variables (neighboring villages , from villages, villages scale reconstruction progress), Z_i is other control variables (Age of building area, floor, etc.), c、 β_i、 α_i is the parameter to be estimated, ε is errors.

5. Result Analysis

The estimation method of the characteristic price model is OLS. After the variable data is imported into SPSS, the forced entry method is used as the regression analysis method. At the same time, in order to test the co-linearity between the variables, the variance expansion factor VIF is used to test.

The influence of the urban villages on the surrounding house prices was studied, and whether the presence of the village in the city within 1km around the community would affect the house prices. The SPSS regression results are shown in Table 2.

Table 2 Model regression results

variable	Non-standardized coefficient B		VIF	
con	9.507***	9.567***		
ln rea	1.022***	1.019***	1.482	1.482
ln flo	0.012***	0.009***	1.354	1.358
ln age	-0.058***	-0.0862***	2.213	2.201
tra	0.058***	0.057***	1.452	1.471
liv	0.036***	0.037***	2.301	2.314
edu	0.046***	0.058***	1.260	1.320
ln qtj	-0.020***	-0.038***	1.404	1.714
nea	-0.023***		1.078	
ln dis		0.013***		1.094
siz		-0.077***		1.300
pro		0.008*		1.112
R²	0.788			
		0.771		

Note: ***means significant at 1% level, **means significant at 5% level, *means significant at 10%.

Analyzing the data in Table 2, it can be seen that the determination coefficient R^2 is 0.788, which indicates that there is a strong linear relationship between the selected independent variable and the explained variable. The model can explain the 78.8% difference in the explanatory variables, indicating that the model has a good fit and has a good explanatory ability.

Analyzing the collinearity between variables, we can see that the smallest VIF among all variables is 1.078 and the largest is 2.301, which is far less than 10, so we can reject the hypothesis that there is collinearity between the variables. There is no collinearity that affects the regression results. The selected 7 control variables have a significant impact on residential prices at the level of 10%, and are consistent with the expected sign. According to the analysis of the " nearby of urban village", it can be concluded that if there is a village in the city 1 km around the residential area, the housing price will be reduced by 2.3% , which means that the existence of the village in the city will have a negative impact on the surrounding house prices.

A preliminary analysis of how villages in the city affect house prices shows that the existence of villages in the city will have a negative impact on house prices. Then we quantify them and introduce variables: "distance of the village", "size of village" and "reconstruction progress", regression analysis was performed, and the results are shown in Table 2.

Analyzing the data in Table 2, it can be seen that the obtained determination coefficient R^2 is 0.771, which indicates that there is a strong linear relationship between the selected independent variable and the explained variable. This model can explain the explained variable 77.1% of the difference, indicating a good fit of the model, has a good ability of interpretation.

Analyzing the collinearity between the variables, we can reject the hypothesis that there is collinearity between the variables. There is no collinearity that affects the regression results. The selected 7 control variables have a significant impact on residential prices at the level of 10%, and are consistent with the expected sign. Analyzing the regression results of the variables related to the village in the city: This regression is different from the initial regression. The influence of the urban villages on the community was quantified, and the distance from the community to the nearest village in the city was calculated. We can know that if the cell and the closer its distance from the nearest village, the lower the prices. The size of the village in the city is also consistent with the expected impact. The larger the size of the village in the city, the stronger the negative impact on house prices. In addition, the reconstruction progress of the village in the city will also have a positive impact on surrounding housing prices.

6. Conclusion

Taking Hangzhou as an example, this paper collects data on 18,737 second-hand housing transactions in 556 communities, and analyzes 37 urban villages. A traditional hedonic model is established. Through regression analysis, we can first draw the conclusion that the existence of a village in the city will have a negative impact on the price of neighboring houses. Then through quantitative analysis of some characteristics of the village in the city, it can be known that the distance between the village and the village positively affects the house price, that is, the closer the village is to the village, the lower the house price is. The progress of urban village reconstruction is positively affecting house prices, that is, the housing prices near urban villages that have been transformed are higher than those near urban villages that have not been transformed.

Acknowledgement

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