

# An Empirical Analysis of the Influence of Urbanization on Real Estate Price in China

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**Abstract.** In order to analyze the impact of urbanization on real estate prices in China, this paper uses Eviews7 to test the stationarity and cointegration of time series data and uses 20 for data processing and principal component analysis. According to the comprehensive analysis of the basic functions of cities and towns, the concept of urbanization has been expanded in the light of the internal and external factors in the process of urbanization from four aspects of economic development, social development, living standards, and infrastructure, including the selected eight second-level indicators that describe the speed of urbanization and the quality of development. The principal component score is obtained, and the regression model is determined by the principal component obtained. Finally, according to the results that urbanization has a positive correlation with real estate, and the harmonious development of urbanization has a significant impact on the good development of real estate, the path for China's urbanization and real estate development is put forward.

## 1. Introduction

Since the reform and opening up, China's urbanization has been developing continuously, but the effect is not satisfactory. For example, quality has not been improved compared to the same period of last year, and speed and quality do not match. To achieve urbanization, the economic level should be improved, the population should be transferred, and social security and quality of life should be improved. With the influx of rural residents into cities and towns, the increasing demand for real estate has driven the development of the real estate industry. At the same time, urbanization and real estate in China are now highlighting a state of coordinated development. This state is conducive to promoting the improvement of China's living standards. This paper uses SPSS20 for data processing and principal component analysis, using the obtained principal components to determine the regression model. At the end of the paper, based on the results of the analysis, a path was planned for China's urbanization and real estate to achieve stable progress.

## 2. Empirical Analysis

### 2.1 Index selection

Since urbanization is still at the development stage, and its impact involves all aspects of society and life, which is very complicated. So at present, there is no complete set of indicators system that can comprehensively measure the urbanization process [1]. On the basis of reading the relevant literature, this article comprehensively analyzes the basic functions of the town, and combines the intrinsic factors and external factors in the process of urbanization to expand the concept of urbanization is expanded from four aspects: economic development, social development, living standards, and infrastructure. After strict screening, the following eight indicators reflecting urbanization level are set up, as shown in table 1.

**Table 1.** Indicator Selection for Urbanization

First-level indicators	Second-level indicators
Social Development	Population Urbanization Rate X1 (%)
Economic development	Coefficient of increase of the tertiary industry X2 (%)
Living standard	Per capita disposable income of urban residents X3 (yuan)
Infrastructure	General public budget expenditure X4 (billion yuan)
	Passenger traffic X5 (ten thousand people)
	Ordinary students in this special school X6 (ten thousand people)
	Community health service center (station) Number of beds X7 (million sheets)
	Basic health insurance for urban residents at the end of the year X8 (ten thousand people)

## 2.2 Principal component analysis

After verifying that the data used is suitable for the principal component analysis, then the selected eight indicators are reduced dimensionally and simplified to one or more principal components [2]. SPSS was used to determine the main components of the eight indicators after normalization from the correlation coefficient matrix, and several indexes that can comprehensively reflect the development of urbanization were extracted based on the cumulative contribution rate to facilitate subsequent analysis. And the score of composition can be calculated based on the linear combination of these eight indicators. The SPSS output is shown as table 2:

**Table 2.** Common factor variance

	X1	X2	X3	X4	X5	X6	X7	X8
<b>Initial</b>	1	1	1	1	1	1	1	1
<b>Extract</b>	0.985	0.982	0.966	0.944	0.403	0.928	0.973	0.986

From Table 2, it can be seen that the variance of the first component is 89.583%. [3]This component can be used to represent the development level of urbanization and further analyze the regression relationship between this component and real estate prices. A principal component score model was built as following formula:

$$F = 0.371x_1^* + 0.37x_2^* + 0.367x_3^* + 0.363x_4^* + 0.237x_5^* + 0.36x_6^* + 0.369x_7^* + 0.371x_8^* \quad (1)$$

## 2.3 Correlation Analysis of Urbanization and Real Estate Price

Using the first principal component obtained above as an indicator of urbanization (U), the real estate price index is measured as the average commercial housing sales price (P). Test U and P whether there is a causal relationship, Granger test results are as follows: ( $\alpha=0.05$ )

**Table 3.** Granger test results

Lag	Null Hypothesis:	Obs	F-Statistic	Prob.	Result
2	U does not Granger Cause P	16	6.14167	0.0162	Accept
	P does not Granger Cause U		0.05497	9.47E-01	Refuse

From Table 3, when Lag=2, U and P have a certain causal relationship, and U is one of the reasons for the change of P.

## 2.4 The regression analysis of urbanization and real estate price

The least squares regression was carried out by SPSS. Finally, the sample functions of the average selling price of commercial housing (P) and the comprehensive urbanization level (U) are as follows:

$$\hat{P} = 4130.188 + 603.724U \quad (2)$$

Goodness of fit test is the test of fitting degree between sample regression line and sample observation value, and its size can be measured by the coefficient of judgment.

**Table 4.** Model summary

Model	R	R 2	Adjust R2	Error of standard estimation
1	.992 <sup>a</sup>	0.984	0.983	210.801

<sup>a</sup>. Predictive variables: (constant), F1

Derived from the model summary, the correlation coefficient of the urbanization level and the real estate price is 0.992, and the coefficient of determination is 0.984. That made by the total variation model of real estate price difference in the interpretation of accounting for 98.3%. So that the model is better fit.

At that time, if the P value was less than  $\alpha$ , it would be rejected, indicating that the linear relationship was significant. On the contrary, if the P value was greater than  $\alpha$ , it showed that the equation was not significant.

**Table 5.** Regression model

Model		Sum of squares	df	mean square	F	Sig.
1	regression	39204129.32	1	39204129.32	882.242	.000b
	residual	622117.121	14	44436.937		
	Total	39826246.44	15			

From the results in table 5 shows that the P value is 0, at the significance level of 0.05 under the premise that regression model is significant, the level of urbanization also shows that U has obvious influence on the real estate price P. This model shows that urbanization has a positive correlation with real estate, and the harmonious development of urbanization has a significant impact on the good development of real estate.

## 2.5 Empirical summary

First, through the analysis of the eight indicators that describe the speed of urbanization and the quality of development, the first principal component is used to represent the level of urbanization. And the load of the principal component on each variable is around 0.3, indicating that this component can reflect the information of the eight indicators, and its practical significance can be better used to reflect the level of urbanization. It is more convincing to use this data to return.

Second, Grainger causality test is used to judge the causal relationship between urbanization and real estate. It lays the foundation for the following principal component regression.

Third, a regression model is set up with the main components of the national commodity house. [4]The main components extracted can reflect the level of urbanization, and the linear relationship between urbanization and real estate price is good. The final model is  $\hat{P} = 4130.188 + 603.724U$ . This model shows that urbanization has a positive correlation with real estate, and the harmonious development of urbanization has a significant impact on the good development of real estate.

## 3. Policy Suggestion

The above analysis shows that the development of urbanization is closely related to the price of real estate. Every factor in the process of urbanization will affect the price of real estate. Here, we put forward the following three suggestions for the coordinated development of urbanization and real estate prices.

### 3.1 Focus on changing government work functions and public services for urban residents.

In the process of urbanization, real estate companies have invested huge sums of money, various

real estate projects have appeared one after another, and many high-rise buildings have emerged, but the corresponding public services and public facilities have not kept pace. In this process, the Chinese government needs to continuously invest public construction funds, especially the basic planning and construction and medical service system. In the process of public service, it is also necessary to introduce more suitable participants to join, and to promote the construction of more public services, so that the concept of public service can be deeply rooted in people's minds. For example, buses and shared bicycles allow more people to enjoy the convenience of urbanization.

### **3.2 Promote the healthy growth of real estate prices**

The process of urbanization has enabled urban residents to expand their residential land and various types of real estate have been established accordingly, which has increased the supply of real estate. Because the urban household registration management problem restricts the urbanization of the agricultural transfer population, housing has the dual attributes of commodity and social security, and the rapid growth of urbanization and real estate prices have also shown an unreasonable growth trend. While the population is flooding into towns and cities, it should also reasonably control the development and construction of the real estate industry. This will not only allow urban residents to accept a relatively reasonable real estate price, but also ensure that real estate prices will grow at a balanced rate.

### **3.3 Promote the scientific growth of real estate prices**

Whether the urbanization system is reasonable and whether the agricultural population can truly integrate into the urban areas is crucial to the harmonious development of the entire real estate industry. With the economic development, the urbanization of household registration has been far from meeting the requirements of urban residents, and more is that they can enjoy the same basic rights as social security, medical care, and infrastructure. Only by respecting the dominant status of urban residents and increasing the public infrastructure measures and social welfare protection in cities and towns to improve the quality of urbanization can we promote the healthy development of real estate prices. At the same time, we must have the idea of scientific development, take into account ecological civilization and urban civilization, improve the carrying capacity of urban resources and the environment, and realize the sustainable development of real estate prices. It is necessary to constantly change the structure of the economy and optimize the spatial layout of residential housing in order to promote the coordinated development of urbanization and real estate prices.

## **4. Conclusion**

In recent years, speed and quality have often been mentioned in the process of developing urbanization. The coordinated progress of the two has always been the emphasis of the people. To develop urbanization means not only to increase the urban population, but also to increase the urban area. It is mainly the process of development from rural areas to towns, including the development of social security, living standards, industrial structure, and infrastructure. Real estate is a basic industry for the improvement of China's political and economic living standards. It has an important relationship with people's livelihood, and the continuous increase in housing prices brings profound meaning to the steady improvement of the economy. The coordinated development of urbanization and real estate can promote the good growth of the national economy.

## **References**

- [1] Xiangling Xiang. *Research on the major theoretical and practical problems of urbanization with Chinese characteristics* [M]. Beijing: Communist Party Central Party School Press, 2015. (In Chinese)
- [2] Zhou Xingxing. Thinking about the speed of urbanization in China [J]. *Urban Planning*, 2006,

30: 32-36. (In Chinese)

[3] Ye Liansong, Geng Xinbin, Ye Xiuting. *Re-discussion on new urbanization efforts to improve the quality of urbanization* [M]. Beijing: Beijing Economic Publishing House, 2014. (In Chinese)

[4] Denise D., William W. Urban Economics and Real Estate Market [J]. *Journal of Urban Economics*, 1996, (7): 21-23.