Research on the Determinants of Real Estate Prices in China under Supply and Demand

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Abstract. Since the reform and opening up, the real estate industry has gradually become the pillar industry of the Chinese people, directly or indirectly promoting the development of macro-economy. However, in recent years, the continuous rise of housing prices has become the focus of attention of the government and all sectors of society, which has triggered extensive and in-depth discussion and attention on the real estate industry. Real estate prices are not only closely related to people's lives, but also related to the development of cities and the long-term stability of the country. The healthy development of the real estate industry is also related to the composition of household wealth and government revenue, as well as the stable development of the national economy. Therefore, it is of great practical significance to pay attention to the changes of housing prices. This paper mainly summarizes and reviews the relevant literature on the analysis of factors affecting house prices at home and abroad from three aspects: the supply side, the demand side and the hedonic price model of real estate. It provides basic underlying logic for academic research, policy-making, practical application and individual house purchase decision-making.

Keywords: Housing price, supply and demand, China.

1. Introduction

The issue of housing price determination has always been a focal point of economic research, and with the continuous progress of research in economics, sociology, politics, and other disciplines, the study of housing price determination theory has become increasingly in-depth. China's real estate is a very important part of the national economy, and its quality is related to various aspects of the economy, such as people's livelihood, employment, residents' wealth, and financial risks. In recent years, the fluctuation of real estate prices in China has been significant, which has had a profound impact on residents' lives, financial stability, and even the entire macroeconomy. It is crucial to objectively evaluate the historical contributions of real estate over the past two decades, face up to the problems encountered in the development of China's real estate industry, promote a soft landing of real estate, and avoid a hard landing. In recent years, many regions across the country have introduced new policies for the real estate market, such as canceling purchase restrictions, relaxing household registration restrictions, and introducing measures such as "trading old for new", to stimulate potential housing demand and promote the stable and healthy development of the real estate market. Compared with the well-established theory and rich practice of foreign real estate market research, China's research on the real estate market started relatively late. This paper will focus on the demand level, and study the influencing factors of housing price from the macro and micro levels. In addition, this article not only systematically sorts out and analyzes the supply factors that affect housing prices, but also uses the hedonic model as an analytical tool to deeply study the formation mechanism of housing prices and their influencing factors. This article aims to systematically analyze the determinants of real estate prices in China from the perspective of supply and demand, reveal the interaction mechanism between various factors, provide theoretical support and practical guidance for the government to regulate the real estate market, and provide underlying logic for academic research and individual housing purchase decisions.

2. Supply and Demand Theory Analysis

Economic principles state that the supply and demand of goods determine their prices, which also reflect a monetary phenomenon. Therefore, as a special commodity, the price of housing is inevitably influenced by the supply and demand of real estate and the money supply. Therefore, the exploration of real estate price fluctuations must incorporate real estate supply, demand, and money supply. Based on the above considerations, the theoretical part of this study focuses on analyzing China's real estate land supply and money supply from the perspective of real estate supply and demand, and on this basis, briefly sorts out the demand side of China's real estate.

2.1. Demand Level

The demand side of the market is one of the decisive factors affecting housing prices. China is a populous country, and with the natural growth of population and the rapid advancement of urbanization, the substantial increase in housing demand has driven the development of housing prices. Due to traditional concepts and cultural influences, the demand for purchasing houses is also greater than the demand for renting houses. The urbanization process in China also closely affects the fluctuations in housing prices.

The purchasing power of housing is inevitably directly related to the local income level, and British scholars have conducted detailed research in this regard. Gilou et al. commented on the view that "the price-to-income ratio is a yardstick for whether each consumer can afford to buy property on average" [1]. If this ratio is too high, higher than the average level, it means that residents are under great pressure to buy houses, and housing prices are likely to be too high. If it is relatively low, it means that the potential purchasing power is still very high, and there is still room for housing prices to rise. According to statistics, almost all cities in China have this ratio higher than the international average. However, the price-to-income ratio is not a good indicator of housing purchasing power, and the reason may be that the purchasing power of home buyers with the same income is simultaneously affected by other factors that affect payment ability, such as loan costs. Many empirical results from OECD countries show that the elasticity of real house prices to disposable income is always positive. The resident debt ratio is also worth paying attention to. In 2004, the average selling price of residential properties in China was only 2548.61 yuan/square meter. By 2017, this number had risen to 7614 yuan/square meter. Meanwhile, the debt ratio of Chinese residents has been rapidly increasing, rising from 5.29% in 2004 to 10.46% in 2017. This article believes that this is caused by two factors. Firstly, in recent years, China's housing prices have risen more rapidly relative to income, leading residents to increase property loans to enhance wealth accumulation, which is the main reason for the rise in residents' debt ratio. Secondly, the rise in housing prices has brought about diversified lending channels, ultimately leading to an increase in residents' debt ratio. These two reasons ultimately led to a significant increase in residents' debt ratio, resulting in a situation where housing prices rose in sync.

Chen Shiqing and Zhu Yulin believe that the increase in urbanization rate has led to a rise in housing prices, and there is a significant positive impact between the two in the long run due to the research interval [2]. The influencing factors and their intensity vary with different research objects. Jin Xiaobin et al. used the system dynamics method to establish a system dynamics model for the development of urban residential industry, attributing the rapid rise in housing prices to several major aspects: large-scale urban demolition, increasing demand for housing among residents, and inflow of migrants [3].

Jiang Chengjie and Zhang Zhongyi believe that the selling price of second-hand housing, the actual interest rate of mortgage loans, and residents' income jointly affect the selling price of new housing [4]. Kong Xing and others believe that the emergence of mortgage loans has stimulated housing demand. Under normal circumstances, the pressure of mortgage loans borne by housing users is less than the repayment constraints, so reducing the loan interest rate can increase residents' payment ability, increase housing demand, and raise housing prices [5]. Based on a large number of empirical research results in the literature, Mishkin made a review of the transmission mechanism of interest

rate impact on housing prices: housing prices are directly affected by the capital cost of consumers' purchasing houses, and the capital cost is affected by interest rates [6].

The impact mechanisms of various economic variables on housing prices can be summarized as follows. First, Short term interest rates and long-term interest rates jointly affect the funding costs of homebuyers and the construction costs of real estate developers, and short-term interest rates often reflect the trend of future long-term interest rates. Secondly, Chinese real estate companies generally have high debt ratios and tight funding chains, which can make them extremely sensitive to policies and interest rates. For example, China Evergrande went bankrupt after the implementation of the 'Three Red Lines' policy, which resulted in a broken funding chain. Thirdly, expectations of interest rates and the economy can affect confidence in rising housing prices, and the financial nature of houses can lead home buyers to engage in price chasing behavior.

2.2. Supply Level

Land supply. Land resources are the foundation of real estate development, and the first increase in the supply of the real estate industry should be the increase in land supply. Currently, China's land system is based on socialist public ownership, and the state, as the representative of the interests of all the people, exercises unified management and control of land according to law. The government plays a key role in this process, exercising the rights to develop and transfer land on behalf of the working people, ensuring the rational use and protection of land resources to promote the sustainable development of the economy and society. The development and construction of land must also be permitted by national laws. The transfer and development of urban land form the basis of urban real estate supply, while the transfer and development of rural homesteads form the basis of rural real estate supply. With the rapid increase in people's income and the intensification of urbanization, urban land supply cannot meet people's demand for urban housing, resulting in a situation of excess demand and insufficient supply of housing.

In the development of China's real estate market, land price, as a type of supply cost, has always been a hot topic for scholars to study its impact on housing prices. Gao Xiaohui constructed a theoretical framework of housing price mechanism based on China's reality and believed that the rise in land prices caused the rise in housing prices [7]. Gao Bo and Mao Fengfu found based on national data that housing prices and land prices only affect each other in the short term, and in the long term, the trend of housing prices determines the trend of land prices [8]. In addition, Tang Qizhan and others used 15 years of data from Guangxi to examine the impact of real estate investment on housing prices and GDP. The results showed that there is a long-term equilibrium relationship and short-term dynamic cointegration relationship between the scale of real estate investment and housing prices and economic growth [9]. Li Yongle and Wu Qun also examined the relationship between real estate investment and housing prices using data from 35 large and medium-sized cities in China from 2002 to 2012, and explained the transmission mechanism between the two. In recent years, more and more domestic scholars have considered government intervention as a supply factor [10]. Wang Yuelong established a game model, and concluded that housing prices will not be affected by land prices in the short term through derivation, and proved that the fundamental reason for the rise in housing prices is spatial monopoly [11]. Kuang Weida established a partial equilibrium model, believing that the establishment of property tax will change the supply of housing, leading to a decline in housing prices, and the impact of property tax has regional differences. At the same time, he found through GMM estimation method that the cost of real estate development will affect housing prices, but the impact of buyers' income is more significant [12].

Through the above research, it can be clarified that the supply of the real estate market affects housing prices. The market is constantly changing, and when it experiences fluctuations, other factors will also generate volatility effects. So, studying market factors mainly focuses on prices. When there is a change in real estate supply, housing prices will also be affected and fluctuate accordingly, that is, when there is a change in real estate supply, it takes some time for housing prices to change. Compared with general commodities, the formation cycle of real estate supply is relatively long, and

there is a significant time lag in real estate prices. So, predicting housing prices based on existing policies and interest rates also requires some time for verification. And the impact of real estate on the economy also has a certain lag.

3. Analysis based on Hedonic Model

The Hedonic price model is a price model established based on the utility theory that the price of a product depends on the satisfaction it provides to consumers through various attributes of the product.

The hedonic price model primarily focuses on the implied prices of product attributes. A review of existing literature reveals that past studies have mainly considered location, structure, and neighborhood attributes when applying the hedonic price model. Location attributes primarily involve measures of landscape and convenience. In the hedonic model, the following variables of real estate are mainly concerned: first, location attributes, which have a significant impact on housing prices, with landscape factors being particularly crucial. Positive landscapes, such as the bustling scene of the central business district (CBD) of a city, lake views, or mountain views, often enhance the value of real estate because they provide visual enjoyment and a comfortable living environment for residents. Conversely, negative landscapes, such as cemeteries or urban villages, may reduce the attractiveness of real estate and hurt housing prices. Additionally, convenience factors include the distance to the core area and nearby shopping facilities. Second, for structural attributes, the size and layout of housing units, as well as the number of houses on a single floor and the height of each floor, are important factors that affect housing prices. The age of the housing (represented by the year it was built) is negatively correlated with housing prices. Third, for neighborhood attributes, socioeconomic variables such as the social class of the neighborhood and the occupation of residents, as well as local government and municipal services such as schools and hospitals, are considered. Fourth, externalities such as the quality of community management, external noise, and shopping centers affect housing prices by affecting actual living comfort. Many of these attributes have been studied by scholars through parametric and non-parametric methods to establish functions. The applicability of hedonic price analysis to heterogeneous goods markets has been widely applied in the West using hedonic price functions to analyze the housing market. Using hedonic price functions to calculate the implicit prices of housing and environmental characteristics is valuable for describing price indices of changes in product quality and estimating or predicting real estate values. Sun Kejun proposed that a cross-sectional analysis of hedonic price models between cities shows that the degree of economic factors determining housing prices in the housing market is gradually decreasing, while the contribution of urban natural environmental factors and urban infrastructure facilities to housing prices is gradually increasing [13]. In other words, people have begun to pay attention to the natural environment and infrastructure facilities of a city when migrating to a city, and are more willing to pay higher housing prices for the natural environment and public services of the city. The hedonic price analysis of the housing market is an important tool for urban economic analysis, and with the continuous development of econometrics over the past 70 years, this technique has been widely applied. The hedonic price model focuses on considering the residential needs of homebuyers and establishes a precise and effective connection between changes in urban housing prices and housing characteristics. It also attempts to extract the weights of different housing effects that affect housing prices. Hedonic price analysis is very useful for urban planners and policymakers, enabling them to fully consider the preferences of prospective buyers for housing attributes when planning residential, commercial, and educational facilities. At the same time, the application of the hedonic price model also helps developers better develop products that make people live comfortably, meet the reasonable pursuit of consumers, rather than blindly pursuing profits, and create unified and featureless products that lack humanistic care.

4. Conclusion

The fluctuations of house prices in major countries around the world have similar laws. Many scholars have systematically explored the factors affecting house prices from different angles and levels with the help of different research methods, and have achieved a series of research results. This paper systematically reviews the driving factors of housing prices from three aspects: demand, supply and hedonic model. The real estate problem in China is not only an economic problem, but also a livelihood problem. In the future, based on the rich research results at home and abroad, we should fully consider the heterogeneity of influencing factors of housing prices in different periods and regions in combination with China's national conditions, and carry out a full study of the real estate market. On the demand side, population structure, population size, monetary policy, and income levels are key factors driving residential real estate investment and consumption. On the supply side, land supply conditions and land transfer policies are considered the two most significant elements affecting real estate prices. From a hedonic model analysis, the hidden value of real estate, residential attributes, regional location, and public services also have a certain impact on housing prices, with the proportion of their influence showing an upward trend. The hedonic model is a good entry point for studying changes in housing prices. Scholars around the world have not conducted much research on it, and this article mainly summarizes and generalizes it. It is hoped that in the future, more in-depth models can be established to conduct more accurate research.

The real estate issue in China is not only an economic issue but also a livelihood issue. The government must take effective measures to stabilize real estate prices, curb excessive demand for real estate, mitigate financial risks, and ensure housing construction. Government departments should regulate the real estate market environment, strengthen industry management; ensure accurate, transparent, and symmetrical market information; improve the structure of the real estate market, establish a tiered consumption concept; strengthen the management and construction of the housing rental market; and strengthen the construction of economical housing.

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