

Analysis on the Influencing Factors of Commercial Investment and Real Estate Price Based on Bayesian Theory

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Abstract: With the continuous improvement and development of China's residential real estate industry, developers can get less and less profits from it. Real estate investment faces a variety of risks, the causes of which are also varied, and the consequences are different. Commercial real estate is becoming a new investment hotspot for real estate developers in China because of its short rise time and large profit margin. Real estate investors often make some subjective inferences about the future based on past and actual market conditions and personal experience. Compared with other industries, the real estate industry has a high degree of comprehensiveness and relevance in the national economy. Commercial real estate investment decisions involve many factors and have a wide range of impacts, and these factors have certain uncertainties. Based on Bayesian theory, this paper analyzes the influencing factors of commercial investment and real estate price, and evaluates the relationship between commercial investment indexes in China.

1. Introduction

The real estate industry is one of the important components of the tertiary industry, is an important pillar industry of national economic development, and is a comprehensive industry integrating real estate development, management and maintenance services [1]. Real estate investment is characterized by large investment and long cycle. Its income and risk are affected by many factors such as political environment, natural environment and social environment [2]. All commodities have prices. As an important commodity related to the national economy and the people's livelihood, the price of real estate will have a great impact on the development of the real estate industry itself, the development of related industries and the development of cities. Whether the real estate investment decision is correct or not is the key to the success or failure of the investment. Compared with other industries, the real estate industry has a high degree of comprehensiveness and relevance in the national economy, and its development can drive related industries to develop at a higher speed [3]. These commercial facilities have brought huge survival pressures to small and medium-sized commercial enterprises, and they have placed too much emphasis on urban landscape requirements and neglected the development of commercial functions, which has caused the project to fall into the embarrassing situation of attracting investment difficulties [4]. Since real estate has the dual attributes of ordinary consumer goods and investment products, and both real estate supply and demand are directly affected by real estate macro policies, the factors and mechanisms of real estate prices are more complicated.

According to classical economic theory, the price of ordinary commodities is determined by the supply and demand of commodities, and the price of real estate is also determined by the supply and demand of real estate. Real estate investors often make certain subjective inferences about the future based on past and realistic market conditions and based on personal experience. If the information materials that the decision makers have is not sufficient enough, and the lack of sufficient knowledge of the real estate market, the decision made will be an inaccurate decision [5]. Most of the domestic commercial real estate developers are transformed from the original residential real estate developers, lacking sufficient funds to guarantee the commercial operation of the project later [6]. The financing channels of commercial real estate are not smooth, and there is a certain financial risk, and the business methods such as the division of property rights sale contain some social risks. With the continuous deepening of China's economic system reform, China's real

estate industry has rapidly recovered, developed and expanded, showing vitality and vitality [7]. Based on Bayesian theory, this paper analyzes the factors affecting commercial investment and real estate price. The purpose is to examine and re-recognize the real estate price level in China, and evaluate the relationship between China's current commercial investment indicators.

2. Analysis of Factors Affecting Real Estate Investment Price

2.1 The Development Status and Characteristics of Commercial Real Estate

When real estate investors make decisions on schemes, their ultimate aim is to obtain higher economic benefits, and the economic benefits of each scheme depend on the sales price. As one of the stakeholders in the real estate market, the local government plays an important role in the cost formation of the real estate industry chain. The average selling price of commercial housing refers to the average price of commercial houses, office buildings, commercial houses and other houses developed nationwide in a statistical year, which is a comprehensive index reflecting the price situation of various real estate in the country. In order to realize the improvement of local fiscal revenue, it is necessary to raise the land cost for real estate development [8]. Local governments will actively use monetary policy under the pressure of increasing the original power of land finance and the assessment of GDP. The impact of policies on commercial real estate is national, and the risks posed by changes in policies will have a major impact on the commercial real estate market. When selecting investment plans and determining investment projects, real estate investors not only pursue high investment efficiency, but also expect risks to be as small as possible. Investors will consider different projects, conduct project value assessments, and optimally allocate limited resources. Choosing the right model and method can effectively manage risk in the investment decision process.

2.2 Risk Analysis of Commercial Real Estate

The advantage of using the income present value method to evaluate the value of commercial real estate is mainly reflected in the comprehensive evaluation of rental cash flow, which can truly reflect the profitability of commercial real estate. By examining the ratio of housing price to income, it not only reflects the affordability of housing, but also reflects some factors that reduce the ratio of housing price to income. High housing prices stimulate consumer demand for investment speculation, widening the gap between real estate supply and demand and further pushing up housing prices, thus advocating a huge bubble in the property market. Other commercial facilities under construction or existing within the service radius of the commercial real estate project will affect the market demand of the project. There are many factors involved in real estate investment decision, and the influence is extensive. The correctness of decision-making depends on the level of investment decision-making, including the scientific nature of decision-making methods and the depth of understanding of objective economic laws.

The fundamental purpose of commercial real estate management is to obtain rental income and return on investment. The valuation method of income law captures the essence of commercial real estate value assessment. When real estates experience large price fluctuations or market sentiment reversals, such a high proportion will make commercial banks face unsustainable credit default pressures. The financial indicators of an enterprise are an important indicator of an enterprise. The business goal of real estate companies is to increase sales revenue, reduce costs and increase profits. The tax paid by the VAT is determined by the difference between the output tax and the input tax. In this mode, tax calculation will increase the number of accounting subjects. As shown in Table 1, the real estate enterprise real estate project development taxation situation.

Table 1 Taxation of real estate enterprise real estate project development

Land approval stage	Housing construction phase	Real estate sales stage	Self-sustaining operation stage
Deed tax	Property tax	Urban maintenance and construction tax	Property tax
Stamp duty	Stamp duty	Stamp duty	Stamp duty
Enterprise income tax	Vehicle and vessel use tax	Surcharge for Education	Urban maintenance and construction tax
Land value added tax	Urban land use tax	Land value added tax	Surcharge for Education

The real estate industry itself has a significant impact on financial stability through its important position in the national economy and its linkage influence on the surrounding and upstream and downstream industries. Real estate investment is affected by many factors, long cycle and complicated relationship among factors. There are often several variables that have great influence on the profit and loss value at the same time. In order to meet the purchase demand of low-income consumers, the state will still encourage and increase the construction of affordable housing and low-cost low-rent housing in the next few years. The higher the expected return of an investment project, the greater the risks it carries. The real estate investment decision involves many factors and has a wide range of influence. Whether the decision is correct or not depends on the level of investment decision. Investors evaluate projects and analyze their effectiveness based on a hierarchical system of qualitative and quantitative measures that use multiple indicators to measure risk and effectiveness. The investment in the real estate industry has become a pivotal factor in the investment in fixed assets of the whole society. The real estate industry can be said to be the growth engine and acceleration engine of the national economy. The supply and demand for affordable housing and low-rent housing will also increase in the real estate market, which will inevitably have a certain impact on commercial real estate.

3. Bayesian Risk Decision-making in Real Estate Investment

Real estate investment is related to the basic needs of the people and the improvement of the quality of life, economic development and urban construction. Any commodity can be represented as a collection of all its attributes. Each commodity also presents heterogeneity because of its unique attributes. In most cases, attributes themselves can not be explicitly traded, so people can not directly observe the prices of these attributes. Because of the high degree of monopoly in the industry, developers have a bargaining advantage in controlling and setting house prices to a certain extent, and further become the booster of house price rise [9]. Once the loan interest rate rises, it will inevitably increase the cost of funds for developers and operators, but also reduce the consumer's desire to buy, which will bring huge financing risks to commercial real estate developers. In the comparison of several different investment schemes, an optimal scheme can be selected. The marginal analysis method and the cost-benefit analysis method can be used to calculate and demonstrate the rationality of the scheme, and find out that the same investment can achieve the maximum return. The real estate industry has a strong ability to absorb capital, a high degree of industrial concentration and a high degree of industry monopoly. Through its high ability to absorb capital and resources, it has a certain negative effect on the upstream, downstream and surrounding industries.

Real estate enterprises also have a lot of difficulties in adapting to the reform from business to increase. Real estate development enterprises are required to pay land value-added tax when transferring the right to use state-owned land and the property rights of above-ground buildings and other attached objects. Tax rates are 30%, 40% and 50% respectively. Assuming that the taxable income is S and the deductible cost accounts for N of the taxable income, since the upstream of the real estate industry is the construction industry, and the value-added tax rate of the construction industry is 11%, after the business tax is changed to increase:

$$\begin{aligned} \text{VAT payable} &= \text{Output tax} - \text{Input tax} \\ &= S \div (1 + 11\%) \times 11\% - ZJ \div (1 + 11\%) \times N \times 11\% \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Tax rate} &= \text{VAT payable} \div \text{Taxable income} \\ &= 0.099 \times (1 - N) \end{aligned} \quad (2)$$

Inconsistency of expected rate of return leads to inconsistency of time discount rate of financial institutions. The discount rate of time decreases continuously, and hyperbola is steeper than hyperbola, which means that the degree of inconsistency of time preference is obvious. As shown in Fig. 1.

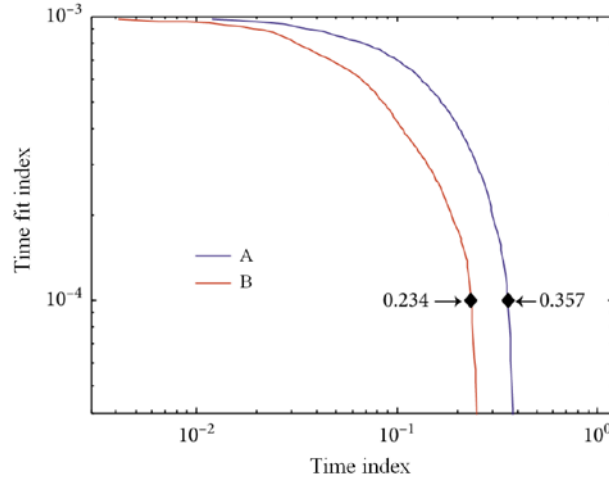


Fig. 1 Time inconsistency curve

Since housing is a large asset, bank credit funds are generally required for purchase, and the interest rate constitutes the cost of purchasing real estate. The higher the interest rate, the higher the purchase cost, the less the real estate demand and the lower the house price. The real estate industry needs intensive capital and large-scale development, which leads to the real estate market's strong ability to absorb social capital. If the decision-making result is very sensitive to the prior probability, it is necessary to collect new information about the natural state through market research and other methods to correct the probability estimation of the natural state [10]. Economic risk refers to a series of uncertainties related to economic environment and economic development, and their emergence will have an impact on the real estate market. If the supply of land in the market is constant, then when the demand increases, the price of land will rise and fall. As a consumer product, interest rate constitutes the cost of house purchase, and interest rate should be negatively correlated with house price. However, as capital goods, real estate as a better value-preserving and appreciation products, interest rates become the basic rate of return on its investment. The real estate investment and construction cycle is long and the amount of funds occupied is large. Once the construction starts, it can not be interrupted. So we need to try to shorten the construction period and put it into the market at the best time.

4. Conclusion

Real estate investment has the characteristics of long cycle and large investment. Its income and risk are influenced by many factors, such as political environment, social environment and natural environment. There is a unique relationship between real estate industry and financial stability in China. This paper discusses the impact of real estate price fluctuation on commercial investment from the theoretical and empirical perspectives. Bayesian decision theory can further study incomplete information or subjective probability, organically combine prior knowledge and survey results to make scientific judgments on the value of information and whether new information needs to be collected. In order to avoid a similar vicious circle, the national level should focus on solving the problem of excessive income distribution gap. In the long run, sharp fluctuations in real estate

prices will threaten financial stability, while short-term fluctuations in real estate prices will help to repair and improve the stability of the financial system itself. When the real estate investment decision-makers are not sure about the estimation of the prior stage, or when there are new changes in the real estate market conditions, the decision-makers can use this method to decide whether to make further investigations. From the results of empirical analysis of Bayesian decision-making model for real estate investment risks, this method is effective in reducing the risk degree of decision-making and has good operability.

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