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Real Estate Level Forecasting - Review

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Abstract
With China's rapid economic growth in recent years and the acceleration of urbanization, the real estate price has also shown a substantial increase, especially the housing prices have always been high in first-tier cities. This paper systematically combs the research on the factors affecting house price and the forecasting method of house price at home and abroad, and puts forward some suggestions on the regulation and control of real estate price in our country. It also points out the deficiency of data statistics and research perspective in empirical research. On this basis, it is proposed that we should strengthen the scientificalness and comprehensiveness of the empirical data, put forward a reasonable and appropriate hierarchical classification method for influencing factors, make clear the importance and coupling mechanism of each level, and excavate the dominant influencing factors.

Keywords: Real state price; Forecasting method; Influencing factors.

1. Introduction
At present, the real estate industry has become an important pillar industry affecting the development of the national economy. The correct decision of real estate enterprises is not only related to their own healthy development, but also affects the macroeconomic fluctuations at the national level. The historical lessons of the western real estate bubble are profound. It is of practical significance to help the managers of the real estate enterprises to maintain a rational attitude, to make scientific and reasonable investment decisions, and to avoid a repeat of history to a certain extent. There are many factors that influence the decision of real estate enterprises. This paper starts with the key factors of the survival and development of real estate enterprises-real estate prices, analyzes the influencing factors of real estate prices, and forecasts the future trend of real estate prices. Hope can provide certain help for the production development and rational decision of the real estate enterprise.

2. Literature Review
2.1. Foreign Literature Review
The foreign real estate market has developed rapidly with the process of urbanization abroad. Up till now, the real estate market is more mature, the real estate price fluctuation is small and the relevant policies and regulations are complete. The related theories of real estate mainly focus on the influencing factors of housing price, such as the

development of housing price model, the influence factors of real estate policy and so on. The main contents of the study are as follows.

2.1.1. Factors Affecting Housing Prices

The research on the influencing factors of housing price mainly focuses on the correlation between population structure and quantity, income level and real estate housing price, the correlation between real estate rent and housing price and the correlation between real estate location and housing price. Bartik has conducted a study about the impact of population and income level on real estate prices, which shows that the growth of population and employment will lead to the growth of real estate prices, but the growth of real estate prices in different regions has significant regional differences (Henry and Herzog, 1991). Abarham put forward a model of housing price change in lag process, including construction cost, resident income, interest rate and employment rate, etc. The simulation results show that interest rate is negatively correlated with real estate price, house construction cost, resident income and employment rate are positively correlated with real estate price (Abraham and Hendershott, 1994). Stuart studied the real estate price change patterns about two big cities in California. According to his research, the main reason for the real estate price change in California this year is the large-scale population migration. Dennis *et al.* (2002) Geoff's research showed that in the long run, the price change in the real estate market is still a classic model of the interaction between price and demand. He thought the real estate market price change is consistent with other commodity market price change principle Geoff (2004).

As far as the influence of real estate rent on real estate price is concerned, people generally think that real estate rent and real estate price are related to a certain extent. Dipasquale put forward Stock-Flow model, and used this model to study the law of real estate market price change. After studying, the scholar found that real estate price and local new There is a dynamic relationship between the number of real estate projects, housing stock, real estate rent, local population and other factors (Dennis *et al.*, 2002). Lee studied the relationship between the choice to buy or rent a house and the residential telephone bill. In his study, the scholar found that in American families, different races have different needs for buying or renting a house. Different demands for buying and renting a house have a greater impact on the price changes in the real estate market.

As far as the location affects the real estate prices, Tang found that real estate prices are positively correlated with the degree of convenience of transportation. In his study, the scholar found that the more convenient the means of transportation, the lower the transportation cost, the shorter the transportation time, the higher the real estate prices in the corresponding areas. . Henderson studied the impact of transportation costs, air quality, geographical location on real estate prices, the scholar's study shows that the lower the transportation costs, the better the air quality, the better the geographical location, the lower the real estate prices. Stegman's research shows that regional environmental specificity also has a relatively important impact on real estate prices. Through field surveys of real estate prices in cities, the scholar finds that the price of housing in the periphery of the city is not necessarily lower than that in the vicinity of the downtown area. The larger the open space in the periphery of the city, the higher the corresponding real estate price (Henderson and Wang, 2007).

2.1.2. Real Estate Market Bubble

Tirtiroglu studied the housing market price who found that the price of the residential market may deviate from the real price of the house, causing a bubble in the real estate market. Bertrand found the existence of speculation in the real estate market in 1999 who found that even in small and medium-sized cities, speculative attitudes also have a profound impact on the prices of the real estate market. The greater the proportion of speculators in buyers occupy, the greater the probability of real estate prices increases. Hing Lingchan studied the characteristics of price changes in the real estate market in Hongkong in 2001 who proved that there was a serious bubble in Hong Kong's real estate market before 1998, and the Asian economic crisis in 1998 triggered the bubble of Hong Kong's real estate market, which led to the rapid decline of real estate prices. Brueggeman introduced inflation into the real estate asset pricing model in 1984, verifying the correlation between inflation and real estate prices (Staley).

2.1.3. Government Policy Implication

Samuel believed that urban planning and development have a direct impact on real estate prices in the region. The expansion of the city will lead to a rapid increase in housing prices and land values in the city, and will lead the price of production to rise sharply (Staley). Landies has empirically analyzed the correlation between urban construction planning and real estate prices who showed that the urban construction planning through the field investigation which has a direct impact on real estate prices, and the local government policies also have a greater impact on real estate prices (Staley). Mc Millan studied the propensity of planning agencies to plan for urban development who found that planning agencies plan for urban development needs to consider the needs of the housing market (Mcmillen and Mcdonald, 1991).

2.2. Chinese Related Research Overview

Most of the current research in China is based on the development of the real estate market in China to study the influence on real estate prices brought by China's land price, consumer attitude and macroeconomic policy.

Yao Xianguo studied the relationship between land price and real estate price whose research showed that there is a correlation between real estate prices and land prices. This scholar's research shows that although there is a strong correlation between real estate price and land price, there is no linear relationship between them. The main

influencing factor of real estate price is the residents' demand for real estate. In other words, the greater real estate the residents demand, the more obviously the trend of real estate rises, and for land prices, the rise in land prices is only the cause of the rise in real estate prices but not the absolute factor 2 (Yao and Huang, 2001).

Shang Mei studied the relationship between real estate prices and investment in the construction industry, unemployment rate, average income level, output of industrial products, interest rate on bank loans, etc. By calculating the correlation between these index sequences and real estate series, Shang Mei points out that these indexes are strongly related to the variables of real estate prices. Shang (2004).

Chen Duochang studied the relationship between real estate taxes and real estate prices. He showed that the main factor affecting real estate prices is the expectation of changes in real estate prices. And the greater the expectations of real estate prices is, the stronger the willingness of residents to buy real estate will be, and the more obvious the upward trend of real estate market prices are. The important factor of the booming real estate market of our country is the strong expectation of the residents' real estate purchase, as well as the influence of the economic environment, the interest rate of the bank, the demographic dividend and so on, which might cause the real estate price of our country to rise all the time. Chen and Tan (2004).

Yao Daquan studied the relationship between government land reserve and real estate prices who pointed out that land policy and land reserve have a great influence on real estate prices, on one hand, local land supply mechanism influences the total amount of real estate development and development distribution, and the more sufficiently land supplies, the more total amount the real estate development has, so that the seller's market of real estate can be transformed into a real estate market. On the other hand, the scarcer the local land resources are, the higher the land price is and the higher the real estate market price is. Yao (2003).

Zhang Daliang studied the relationship between the real estate prices and the needs of the cohabitation who thought that the residents' price concept, consumption ideas, investment ideas and so on affect the residents' demand for real estate. The change of real estate price will be directly affected. The stronger the demand for housing, the higher the real estate price will be. Sex becomes bigger, and vice versa (Zhang and Zhou, 2004). The level of residents' demand directly affects the change of real estate prices. The more the residents need housing, the more likely it is to raise real estate prices, and vice versa.

Wang Xia studied the impact of traffic environment on real estate projects, which is based on the residential areas along the Beijing Metro, especially studied the change of housing price in the residential area around Beijing Metro Line 13. The scholar found that the change of the price of the residential area around Line 13 is obviously related to the location of the region. The worse the location of the district is, the farther away from the city center is, the greater the price will rise and the better the location of the district lies. On the contrary, the closer to the city center is, the smaller the prices will rise Wang *et al.* (2004).

In response to the research field of "predicting real estate prices", many scholars have selected different prediction models to conduct related research and exploration.Dong Qian and other scholars selected six different measurement models to fit and predict the price of second-hand houses and new houses in 16 cities in China. The operating base is China's largest search engine index - Baidu.The research shows that the data obtained by the network search engine is the ideal base for predicting the house price index. It can also be applied to the analysis of the behavior trend and law of economic subjects, and has a time-effectiveness (Dong *et al.*, 2014).Wang Cong used the "least squares multiple regression analysis method" and the "LOGISTIC regression analysis method" to analyze and predict real estate prices, and the results show that the latter has higher prediction accuracy (Li *et al.*, 2008b). Ding Feng selected three predictive models for studying housing prices in Shanghai: 'Time Series Prediction Model', 'Gray Prediction Model', and 'BP Neural Network Model'. The results show that house prices will continue to rise in the next year (Staley). Pan Zhi'an and other scholars believe that the "BP neural network" with "error back-transfer algorithm" can analyze and predict real estate prices, and the results also verify that this algorithm can predict real estate prices well (Pan and Shen, 2014).In the study of "real estate price forecasting", Li Wanqing and other researchers paid attention to the accuracy and convergence speed of different types of "neural networks" to predict real estate price indices. Both the research results and the prediction results show that the wavelet neural network has the best prediction effect compared with other neural networks (Li *et al.*, 2008a).In order to solve the problem of long learning time and low precision of traditional BP neural network with factor redundant information, Zhang Wei combines rough set theory with BP neural network to construct a new real estate price forecasting model.The principle is that the theory of rough set is used to reduce the redundant information in the real estate price, and then BP neural network is used in the prediction. The results show that the speed and accuracy of the model are greatly improved (Zhang, 2011). Li Daying et al. combined the rough set theor and wavelet nerve in "fuzzy mathematics" to construct a model for real estate price prediction (Li *et al.*, 2009). Yang Liya and Shao Chunfu studied the influence of urban rail transit on the surrounding real estate prices, and proposed a combined forecasting model. The principle is to use the fitting function of BP neural network.Firstly, the real estate price data is roughly fitted, and then the Markov chain is used for more accurate prediction. The final result shows that the model has high precision. (Peng and He, 2012; Qian *et al.*, 2009; Ren and Du, 2012; Yang and Shao, 2008).

As for the research on the prediction of real estate prices by the gray prediction model GM (1, 1) model, many scholars have carried out certain research and achieved certain results (Peng and He, 2012; Qian *et al.*, 2009; Ren and Du, 2012).

Zhang Shanyu and Xu Hui conducted an in-depth study on the grey prediction model. They believed that there are some unreasonableities between the improved form and the discrete model of the traditional grey prediction model. The combination of the two forms a new gray model - DGM (1, 1) The model and verification confirmed that the new model is reliable and effective (Zhang and Xu, 2013).

3. Insufficient Research at Present
3.1. Empirical Research Data That Are Not Comprehensive and Not Uniform

The amount of data sources used for property analysis in different departments, different regions, and different fields is limited. Moreover, its statistical caliber and standards are inconsistent, which leads to the fact that the empirical analysis data for real estate is often not uniform. This leads to the fact that the empirical analysis data for real estate is often not uniform. Moreover, there are many factors affecting real estate prices. Many influencing factors are often mutually constrained, so the causal relationship between the influencing factors is not clear. For example, it is widely believed in the literature that a drop in interest rates has led to a large influx of funds into the real estate market, which has raised housing prices. However, from a policy-making perspective, high housing prices may also be the reason why the government adopts a higher interest rate monetary policy.

Lack of research that combines supply-side and demand-side factors and factors that affect both supply and demand. Current research is often limited to the limited information that can be collected at hand. The usual practice is to use several relevant factors as variables, and use house prices as dependent variables to conduct multiple regression analysis. These variables are either variables on the supply side or variables on the demand side. It is not uncommon to consider the combination of the two. Secondly, the influence weights of various influencing factors within each level and the coupling mechanism between different levels of influencing factors have not yet been clarified, so as to unearth the leading influencing factors. As a result, the usual regression analysis method has not been used to demonstrate the sufficiency of the selected research variables, and the blindness of the human cloud has led to the selection of many weak variables and the omission of many important variables. In addition, the relationship between the various influencing factors is not fully explored. The mutual conversion mechanism between the supply and demand factors is not considered, resulting in the lack of joint variables between the factors in the regression equation.

4. Conclusions

The research literature on the factors affecting real estate prices is reviewed, which discusses the three aspects of demand side and supply side, and factors affecting both supply and demand, and proposes two suggestions:

Strengthen the scientific nature of data statistics in empirical research.The data of housing price research should be more standard and comprehensive. Research should combine multiple factors such as demand side and supply side. Propose a reasonable and moderate hierarchical classification method for a large number of influencing factors. Clear out the influence weights of various influencing factors within each level. And the coupling mechanism between different levels of influencing factors, so as to explore the dominant influencing factors.

This paper reviews the current literature on real estate price forecasting models and analyzes the current mainstream mathematical models used to predict real estate prices. And make the following three suggestions;

The current mainstream neural network models, gray-Markov prediction models, and random time series models all have their own advantages and inherent deficiencies;

The shortcoming is mainly because its algorithm can not introduce various constraints on the impact of supply and demand factors on housing prices, and only reflects the changes in housing prices from one aspect.

To this end, it is necessary to further clarify the influencing factors and mechanisms of the dominant house prices, use mathematical language to describe the impact mechanism and introduce the model, and make corrections to obtain a more objective and accurate model.

With the development of big data technology, the house price prediction method based on network keyword search technology has good timeliness, and can study the characteristics of home purchase behavior through consumer network behavior, which will be widely used.

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