

Strategic Exploration of High-quality Development of the Housing Market based on Housing Investment: An Example of Guangzhou

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Abstract

As China enters the stage of high-quality development, there is an urgent need to form a high-quality development housing system to match. This paper focuses on residents' housing investment and conducts an empirical study using micro-transaction data and characteristic price models. It is found that residents have investment preferences for the indicators of "total scale - location - quality facilities". Finally, a series of policy recommendations are proposed for the Guangzhou housing market in terms of top-level design, practical exploration and implementation.

Keywords

Housing Investment; Quality Development; Strategy Exploration.

1. Introduction

Since the reform of housing monetisation, China's real estate industry has made a great contribution to the people's peace and happiness. At the same time, it has also exposed such drawbacks as high housing prices, imbalance in the supply structure, and serious polarisation between the rich and the poor, etc. At the end of 2016, the Economic Work Conference of the Central Committee of the Communist Party of China, while elaborating on the "Promotion of the Stable and Healthy Development of the Real Estate Market," explicitly demanded that "adhere to the positioning of 'houses are for living, not for speculation'". As one of the most important economic regions in the Guangdong-Hong Kong-Macao Greater Bay Area, Guangzhou has responded positively and introduced complementary policies one after another. With the impact of the COVID-19 epidemic, the sharp rise in property prices has been effectively curbed. The market trend is relatively stable, but has not yet achieved the goal of stable and healthy development. It is not enough to achieve a rational return of the housing market by local governments' continuous increase in regulation, but should also optimise the market from the supply side, and realise the high-quality development of the housing market by taking the demand for high-quality housing as the endogenous driving force.

Housing investment is a certain scale of economic activity carried out by residents to gain profits in the housing market, which to a certain extent can reflect the market sentiment and future expectations of the real estate industry. Investors tend to purchase property as a means of investment with a view to obtaining a higher return on investment, rather than viewing the purchase of property as the fulfilment of personal needs [1]. So in a broad sense, whether the purchaser is using it for self-occupation, renting it out, or waiting for it to increase in value, the act of paying for the property to be purchased at a specific point in time in order to obtain the expected benefits or other value falls within this paper's "Housing investment" is the scope of the study. Residents' demand for housing investment characteristics, not only encompasses the housing area, age and other quantitative indicators commonly used in academia, but also has a preference for the location of the environment and the potential value of the information factors, which can be summarised as three dimensions: total scale - location - quality facilities. Under

the current tightening of property market regulation, what type of housing characteristics do Guangzhou home buyers prefer? How to optimise the existing housing supply and protection policies for different audience groups? How to design a long-term institutional mechanism to promote the stable and healthy development of the real estate market in Guangzhou?

Reviewing the existing research on the housing market, the literature on housing investment at the resident level has mostly studied the financial asset allocation of family units from a micro perspective, such as Zhengcheng Ma et al., who found that Chinese families' housing assets have a crowding-out effect on risky financial asset investment [2], and Chuanyong Zhang, who pointed out that families' over-reliance on housing investment affects the reasonableness of the family's asset allocation and promotes an uneven distribution of wealth in society [3]. Regarding the optimisation of housing supply, most studies have used qualitative analysis methods to explore the increase of effective housing supply in terms of clarifying governmental responsibilities, strengthening monetary policy, and incentivising market players [4,5,6]. Because of the lack of strong data support, the research conclusions are not long-term, relevant and representative. However, due to the lack of strong data support, the conclusions of the study lack long-term, relevance and representativeness. In addition, there are fewer studies related to the housing market in Guangzhou, and more scholars explore the regional linkage effect of the real estate industry from the perspective of the Pearl River Delta city cluster. Relevant subjects include real estate market bubble measurement and spatial effects [7,8,9,10], and real estate market environment of each city [11,12,13]. Literature that can take into account the changes in housing finance attributes in Guangzhou City is relatively lacking. In view of this, this paper will take housing investment in Guangzhou as the research object, and construct a demand indicator system for identifying residents' preference for housing investment characteristics. Through the empirical results, it will then propose ideas for housing supply optimisation policies.

2. Models and Data

2.1. Data Sources

In this paper, the second-hand house transaction data from January 2017 to December 2022 were collected from Guangzhou Chain Home Network (<https://gz.lianjia.com/>) using Python programme. The spatial scope is the whole city of Guangzhou with 11 districts. The reason for selecting stock housing as the object of study rather than newly built commercial housing is that, on the one hand, stock housing transactions accounted for 45%-60% of the total sales volume in the citywide region during the study period. On the other hand, the transaction price of stock housing reflects the actual housing investment demand of residents after the game between the supply and demand sides, and covers the product characteristics and location factors of the current period, which can better exclude the influence of developer-led pricing.

2.2. Data Preprocessing

First, the crawled sample housing investment data were initially organised to remove missing and extreme values. Second, the sample data and public facility POI data were imported into ArcMap, and the coordinate system was defined as WGS-1984 to check for offset from the map. Next, the minimum straight-line distance of each housing sample from each public facility respectively was calculated using the Generate Neighbourhood Table tool in ArcGIS. The valid sample for this paper is 65,129 second homes within 4,231 stock housing communities.

2.3. Variable Descriptions and Model Settings

Based on the previous description, the influencing factors of residential housing investment can be divided into three categories of factors: total size, location and quality facilities. The specific measurement indicators for each variable are selected as follows.

Housing investment (*invest*). In this paper, the actual transaction price per square metre of stock housing is used as a measure of housing investment. In order to keep the variance constant and the data concentrated, and to eliminate the influence of possible skewed distributions, the empirical analyses will take logarithmic calculations.

Total scale. In this paper, we mainly select three physical characteristic indicators: housing age(*houseage*), floor(*floor*) and room area(*roomarea*). House age is calculated by the difference between the year of transaction and the year of completion. The number of floors is divided into low, middle and high floors, and the values of 1, 2 and 3 are assigned to low, middle and high floors, respectively, using the classification of floors by Chain Home.

Location. In this paper, the straight-line distance between the transaction housing and the nearest primary school(*dis_primary*), middle school(*dis_middle*), college(*dis_college*), subway station(*dis_subway*), park(*dis_park*), mall(*dis_mall*) and general hospital(*dis_hospital*) is selected as the characteristic variable. Calculations are in kilometres. As for the urban planning function and occupational and residential distance and other indicators involved in related studies, we do not consider them for the time being due to the limitation of information acquisition and quantification.

Quality facilities. In this paper, it is reflected by the availability of lifts(*lift*), the degree of decoration(*decoration*), orientation(*south*), the number of bedrooms(*bedroom*), living rooms(*living*) and bathrooms(*toilet*). The data of property management, greening and residents' quality are difficult to obtain, so they are not selected into the research scope. The variables and statistical results are shown in Table 1 below.

This paper uses a characteristic price model to identify the demand for housing investment. At the same time, the logarithmised regression parameters are compared to ensure the rigour and robustness of the conclusions. In this paper, linear model and least squares estimation are used. The model is set up as follows.

$$invest = \alpha_0 + \alpha_1 L_i + \alpha_2 M_i + \alpha_3 N_i + \eta_t + \lambda_d + \varepsilon_{idt} \quad (1)$$

$$\ln invest = \beta_0 + \beta_1 L_i + \beta_2 M_i + \beta_3 N_i + \theta_t + \gamma_d + \mu_{idt} \quad (2)$$

Table 1. Variables and Statistical Results

Variable Name	Mean	SD	Min	Max
<i>invest</i>	33084.08	16882.269	2196	235110
<i>houseage</i>	16.288	7.518	0	71
<i>floor</i>	2.096	0.763	1	3
<i>roomarea</i>	82.693	33.787	7.65	863.13
<i>dis_primary</i>	0.484	0.383	0.024	4.321
<i>dis_middle</i>	0.747	0.669	0.009	10.388
<i>dis_college</i>	2.175	2.015	0.008	14.814
<i>dis_subway</i>	1.118	1.443	0.019	17.131
<i>dis_park</i>	0.835	0.634	0.003	9.334
<i>dis_mall</i>	0.759	1.164	0.001	12.978
<i>dis_hospital</i>	0.743	0.694	0.009	11.661
<i>lift</i>	0.581	0.493	0	1
<i>decoration</i>	2.528	0.575	1	3
<i>south</i>	0.706	0.455	0	1
<i>bedroom</i>	2.404	0.811	0	9
<i>living</i>	1.481	0.557	0	5
<i>toilet</i>	1.269	0.516	0	7

In the formula, the explanatory variables *invest* and *lninvest* refer to the original value of the housing investment reflected by the transaction price and the logarithmised value, respectively. *L*, *M*, and *N* denote the variables comprising the total size of the housing stock, the location of the area and the quality of the amenities characteristics, respectively. Subscripts *i*, *d*, and *t* denote the sample of housing transactions, the spatial segment (or neighbourhood) in which they are located, and the time of housing transactions, respectively. Time fixed effects η_t and θ_t are introduced into the model to strip out the influence of the time factor. There are spatial differences across spatial segments (or neighbourhoods), so the model also controls for spatial segment (or neighbourhood) fixed effects λ_d and γ_d to eliminate the effects. In addition, ε and μ are random error terms.

3. Empirical Identification of Housing Investment Demand

The control of model fixed effects is referred to Cong Sun et al.[14]. The regression coefficients and parameter estimation test results for the model's three indicator variables of total scale, location, and quality facilities are detailed next.

3.1. Total Scale Requirements

Since demand characteristics such as floor and room area vary significantly within the same community, these demand indicators should be analysed using more stringent community fixed effects. House age characteristics do not vary significantly within the same community and need to be analysed through differences between communities. Therefore, the regression process also relaxes the community fixed effects into a plate fixed effects comparison. To prevent the impact of market supply and demand at different time points on transaction prices, year fixed effects are controlled for in the model. The estimation results of the demand variables related to total scale are shown in Table 2.

Table 2. Investment Requirement Factors for Total Scale

Variable	<i>invest</i>		<i>lninvest</i>	
<i>houseage</i>	-197.6*** (-17.62)	-611.6*** (-92.85)	-0.00550*** (-19.80)	-0.0170*** (-99.26)
<i>floor</i>	22.87 (0.83)	20.46 (0.47)	0.000755 (1.11)	0.000264 (0.23)
<i>roomarea</i>	-2.968** (-3.26)	55.58*** (50.87)	-0.000232*** (-10.24)	0.00137*** (48.33)
Cons	52260.5*** (17.39)	-3132.6 (-1.34)	10.79*** (144.81)	8.628*** (141.94)
Community fixed	yes	no	yes	no
Plate Fixed	no	yes	no	yes
Year fixed	yes	yes	yes	yes
N	65129	65129	65129	65129
Adjusted R ²	0.912	0.752	0.933	0.794

Note: ***, **, * represent significant at the 1, 5 and 10 per cent levels, respectively.

We can see that the indicators related to total scale, *houseage* and *roomarea* variables pass the test at the 1 per cent significance level. The log-linear model controlling for community fixed effects has a much better fit, with an adjusted R² of 0.933. This section focuses on the regression results of this model to identify investment demand characteristics. Housing investment per unit area is characterised by a marginal decline as *houseage* increases. After controlling for community fixed effects, housing investment will decline by 0.55 per cent for each additional

year of housing age. The *floor* characteristics variable does not pass the 10% significance test. It means that there is no significant difference in residents' willingness to invest in high, medium and low floors of housing. As for *roomarea*, there is a difference in investment demand controlling for community fixed effects and plate fixed effects. Homebuying groups within the same community tend to invest their money in smaller room areas, while house with larger areas in different communities is more favoured by investors. Within the same community, housing investment will fall by 0.23 per cent for every 10 square metres increase in *roomarea*, and will rise by 1.37 per cent for every 10 square metres increase in *roomarea* between communities in the same plate.

In summary, homebuyers prefer to invest in young and new properties. Homebuyers within the same communities prefer smaller houses, while homebuyers between different communities prefer to invest in larger houses. After controlling for community fixed effects, the above model has difficulty identifying the demand for investment in locational lots between communities. Subsequent analyses of location factors will be conducted using a plate fixed effects model.

3.2. Location Requirements

Next, the location variables, which reflect the spatial relationship between house and urban utilities, is introduced into the model. The regression results are shown in Table 3 below.

Table 3. Investment Requirement Factors for Location

Variable	<i>invest</i>	<i>lninvest</i>
<i>dis_primary</i>	-1595.480*** (-11.73)	-0.058*** (-16.69)
<i>dis_middle</i>	-1233.823*** (-12.04)	-0.050*** (-18.99)
<i>dis_college</i>	933.467*** (16.01)	0.030*** (19.70)
<i>dis_subway</i>	-1953.946*** (-31.33)	-0.067*** (-41.90)
<i>dis_park</i>	-334.652*** (-3.27)	0.015*** (5.73)
<i>dis_mall</i>	742.857*** (8.07)	0.025*** (10.71)
<i>dis_hospital</i>	321.518*** (3.51)	0.005** (2.00)
Cons	6584.386*** (2.71)	8.991*** (144.79)
Total Scale, Plate and Year fixed	yes	yes
N	65129	65129
Adjusted R ²	0.758	0.802

Note: ***, **, * represent significant at the 1, 5 and 10 per cent levels, respectively.

With regard to educational facilities, three variables reflecting different educational stages, primary schools, middle schools and colleges, were introduced into the model. All three indicators of educational resources passed the 1 per cent significant level test. Among them, the regression coefficients of the straight-line distances of primary and middle schools are negative, and each increase in straight-line distance by 1 kilometre decreases housing investment by 5.8 per cent and 5.0 per cent respectively. This suggests that the proximity of basic education resources encourage residents to invest in home purchase, especially the arrangement of

school districts for the nine-year compulsory education, which effectively influences people's choices. This is consistent with the findings of the academic research on "school district housing". The regression coefficient of straight-line distance to colleges is positive, which means that there is no price premium for housing around colleges. This may be due to the fact that colleges are located in remote areas with fixed facilities, making it difficult for them to become busy economic zones. Therefore, the return on investment in colleges is not high.

In terms of public transport, the straight-line distance to rail transit stations has a significant effect on housing investment and passes the test at the 1 per cent confidence level. The metro provides great convenience for the daily travelling of the homebuying group. For every 1 kilometre increase in straight-line distance to subway, housing investment will decrease by 6.7 per cent, which validates the characteristic demand of investors for rail transit accessibility. Home buyers are more likely to believe that if they buy a house for the same price, the value of choosing a house along the metro is higher.

In terms of recreation, straight-line distances to parks and malls show a positive correlation at the 1 per cent significance level. In other words, for every 1 kilometre increase in the straight-line distance between the property and the park, the housing investment will increase by 1.5 per cent. Whereas, for every 1 kilometre increase in straight-line distance to a mall, housing investment will increase by 2.5%. It can be seen that home buyers are not the ones who will choose to invest in properties that are closer to parks and shopping malls. The possible reason for this is that there are often residents carrying out outdoor activities in recreational venues such as parks and shopping malls, and there are problems of crowding and noise, which have an impact on the quality of life of the homebuying group.

With regard to medical facilities, the straight-line distance to a general hospital has a somewhat positive effect on housing investment, passing the test of significance at the 5 per cent level. For every 1 kilometre increase in straight-line distance, housing investment increases by 0.5 per cent. On the one hand, closer proximity to general hospitals is prone to traffic congestion. On the other hand, homebuyers who have a need for hospital support resources around their homes tend to have elderly people at home. They will opt for larger designated speciality hospitals and are psychologically repelled by hospital neighbourhood housing.

3.3. Quality Facilities Requirements

Table 4. Investment Requirement Factors for Quality Facilities

Variable	<i>invest</i>	<i>linvest</i>
<i>lift</i>	4679.974*** (50.08)	0.155*** (65.33)
<i>decoration</i>	1401.788*** (17.68)	0.047*** (31.19)
<i>south</i>	479.707*** (7.16)	0.010*** (5.74)
<i>bedroom</i>	620.956*** (8.92)	0.027*** (15.00)
<i>living</i>	1609.413*** (22.43)	0.049*** (26.89)
<i>toilet</i>	1003.912*** (10.81)	0.022*** (9.40)
Cons	-12771.144*** (-5.60)	8.318*** (143.50)
Total Scale, Plate and Year fixed	yes	yes
N	65129	65129
Adjusted R ²	0.767	0.814

Note: ***, **, * represent significant at the 1, 5 and 10 per cent levels, respectively.

The quality of housing amenities is also an important factor that residents consider when choosing houses. Housing in the same community is very similar in terms of lift, decoration, orientation and type, so control for total scale characteristics and plate fixed effects are used and quality facility related indicators are introduced. The results in Table 4 show that all six indicator variables are significant at the 1 per cent level, which means that homebuyers are more inclined to purchase housing with lifts, fine decoration, south orientation and reasonable house types. In particular, housing investment is 15.5 per cent higher for homes with lifts than for homes without lifts, 4.7 per cent higher for each level of decoration, and 1.0 per cent higher for homes facing south than for those not facing south. In addition, the number of bedrooms, living rooms and bathrooms all have a positive effect on housing investment.

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4. Countermeasures for High-quality Supply in the Housing Market

4.1. Top-Level Design: Mapping and Building the System

Mapping the city's home base and clarifying the characteristics of demand and inventory. Government departments can make use of macro data support and refer to academic research results to study housing construction hotspots, population flow trends and industrial concentration characteristics in Guangzhou, providing a basis for decision-making on housing supply in each district. For example, map the electricity consumption of residents to focus on housing construction hotspots, which will be given priority consideration in future housing construction. Analyse the match between growing enterprises and the distribution of talents, to clarify the gathering trend of various types of talents, and promote housing construction to achieve the consistency of "people+enterprise+housing". Identify potential areas for cross-municipal foreign population concentration through big data, base on the coordinated development of the Guangdong-Hong Kong-Macao Greater Bay Area, provide policy protection for migrant workers in Guangzhou, so as to work towards the goals of work-life balance and integration of industry and cities.

Improve the existing housing system and build a long-term operation mechanism. Systematically consider the construction of Guangzhou's housing system in terms of urban objectives, spatial development, land supply, industrial cultivation and financial support. Establish a linkage mechanism between urban renewal and housing supply, and steadily increase the supply of commodity housing and guaranteed housing. The effective supply of three types of housing - talent housing, commercial housing and guaranteed housing - is the top priority. Relying on the housing rental market, commercial housing will be converted into talent housing and guaranteed housing through acquisition or allocation. Talent housing is supplied on a graded basis, with guaranteed housing providing the low-end demand, commercial housing meeting the high-end demand, and part of the rental market and commercial housing being deployed to meet the mid-range demand.

4.2. Practical Exploration: Optimising Supply and Laying out Resources

Optimising the spatial distribution of housing, and providing products that meet the needs of different locations. The supply of urban residential land and housing should be optimised, taking into account the demand of home-buying groups for location. For example, the characteristic price model concludes that the smaller the straight-line distance to the nearest metro, the more willing residents are to invest in the housing market. Therefore, it is necessary to combine social development expectations, based on the actual needs, and scientifically

optimise the layout of metro station construction. At the same time, it is necessary to design and supply housing products that meet the needs of the population, and satisfy the different preferences of home-buying groups in different spatial locations in terms of floor space and household design.

Allocating housing resources to meet the housing needs of different income groups. The supply of appropriate housing products should be graded according to a pattern of diversification and differentiation. Low-income residents need to be insured to the fullest extent possible, and the market should be guided by the government to provide more small-sized affordable housing through such forms, as housing subsidies and public rental housing. For middle-income class, as well as urban newly employed workers, the early stage can be modelled on the policy of low-income groups, increasing financial and policy support for this group, and the later stage can be allocated to the sale of shared ownership housing and other low-priced housing sources, to reduce the burden of their housing. For the high-income group, to meet the demand for improved housing and to enrich the market supply of diversified products. The government can implement policies such as lifting the restriction on home purchase, thereby lowering the barriers for consumers to purchase homes and meeting their demand for improvement.

4.3. Ensuring Fulfilment: Improving Policies and Co-ordinating Supervision

Improving the policy guarantee for the construction of the housing system. With the support of several policy documents, a 1+N housing policy system has been established. That is to say, 1 plan to lead and N methods to support, to ensure the stable development of housing in Guangzhou.

Stabilising the market through a multi-sectoral approach. Establishing a linkage mechanism for housing and land prices, exploring means of protecting housing and attracting talent, and setting a ceiling on land prices within a reasonable range. The Housing and Urban-Rural Development Bureau is being promoted to link up with the natural resources departments within each municipality to achieve the stabilisation of housing prices. Increase co-ordination and supervision when stock of second-hand housing is traded. In the face of intermediary housing monopoly, fictitious transactions, speculation in school districts, qualification falsification, earning price differentials and other forms of speculation in the housing market, we should strictly combat and rectify the situation to ensure the stable and healthy operation of the stock of housing market.

5. Conclusion

This paper crawls the data from Chain Home and conducts research from the perspective of individual homebuyers. It constructs a three-dimensional indicator system of *total scale - location - quality facilities*, and realises the quantitative identification of investment demand by using the characteristic price model.

The study found that only the number of floors of housing did not significantly affect housing investment in the indicator system of demand characteristics. (i) For the total scale, housing investment will decrease by 0.55 per cent for every one-year increase of *houseage*. The effect of *roomarea* impacts differ when controlling for community and plate effects. For every 10 square metres increase in *roomarea* within the same community, housing investment will fall by 0.23 per cent, while between different communities, housing investment will rise by 1.37 per cent.

(ii) In terms of location, the regression coefficients for straight-line distances to *primary* and *middle* schools are negative, and for every 1-kilometre increase in straight-line distances, housing investment decreases by 5.8 per cent and 5.0 per cent respectively. *College* does not have a premium effect on neighbourhood housing. For every 1-kilometre increase in straight-line distance to *subway*, housing investment decreases by 6.7 per cent. Home buyers are not the

ones who will choose to invest in properties that are closer to *parks, malls* and general *hospitals*. (iii) In terms of quality facilities, residents are more inclined to buy properties with lifts, well-furnished, facing south and with reasonable house types. Among them, the investment in residences with *lifts* is 15.5 per cent higher than that without lifts. For each level of renovation, the investment in housing increased by 4.7 per cent. Housing with a south orientation was 1.0 per cent higher than that without.

In fact, the value of residents' investment in housing not only includes the characteristics of housing itself, such as *total scale - location - quality facilities* constructed in this paper, but also covers the group's own stage needs, such as the need to get married, to settle down, for job stability, and so on. Future research can focus on mining spatial databases that can match the information of homebuyers, identifying whether the homebuyers are recent college graduates, non-household homebuyers, and so on, so that we can explore the differentiated investment needs of different groups of homebuyers, and design a more refined housing supply and protection policy.

References

- [1] Kong H. Analysis of the impact of investment housing demand on commercial housing vacancy rate[J]. Enterprise Technology Development,2010,29(05):98-100.
- [2] Ma Z, Yang C, Cai M. Impact of housing assets on investment in risky financial assets-an empirical study based on Chinese households[J]. Shanghai Finance,2019(01):1-8.
- [3] Zhang C. Housing investment, household asset allocation and social wealth distribution[J]. Academic Monthly,2014,46(12):109-114.
- [4] Yi C, Chen J. Research on the Realistic Dilemma and Optimisation Path of Increasing Effective Supply of Rental Housing[J]. Administrative Reform,2021(09):50-59.
- [5] Wang X, Chen M. Monetary policy, housing supply and long-term mechanism for healthy development of real estate market[J]. Journal of Jiangsu Administrative College,2023(01):49-55.
- [6] Chen N, Zhu Q, Fang W. Research on the optimisation of collective rental housing supply guided by market-oriented allocation of factors--Taking Guangzhou as an example[J]. Southern Architecture, 2023(05):48-55.
- [7] Wang Z, Ming J. An empirical study on the measurement of property bubble in the Pearl River Delta--Taking Guangzhou as an example[J]. Economic Geography,2007(05):819-822+846.
- [8] Chen Z, Huang Z. A study on the interaction of property prices in the Pearl River Delta Economic Zone -- Taking Guangzhou, Shenzhen and Dongguan as an example[J]. Southern Finance,2010(04): 82-86.
- [9] Guo W, Chen S. Research on the spatio-temporal contagion effect of urban housing price bubbles in the Pearl River Delta region and its prevention[J]. Economic Jingwei,2018,35(06):15-21.
- [10] Zhang R, Shi X, Zhang Y. Comprehensive evaluation of real estate investment environment of China's three major city clusters based on entropy value method[J]. Management Modernisation, 2013(03): 19-21.
- [11] Chen Y, John M.Clapp, Dogan T. Residential Demand Price Elasticity Analysis Based on Characteristic Price Model -- An Empirical Study on Shenzhen Residential Market[J]. Urban Development Research,2011,18(02):62-67.
- [12] Lin J, Xu S, Huang J. Adaptive Expectations, Financial Accelerator Effect and House Price Volatility-- Taking Shenzhen as an Example[J]. Modern Finance and Economics(Journal of Tianjin University of Finance and Economics),2015,35(01):22-31.
- [13] Lin W. Analysis of factors influencing real estate prices:A data test in Foshan, Guangdong[J]. Southern Finance,2012(03):43-45+13.
- [14] Sun C, Liu X, Yao L. How can housing supply in the new era meet the differentiated needs of rental and purchase groups? --Taking Shanghai as an example[J]. Financial Research,2019,45(01):75-88.