

Research on Influencing Factors of the Real Estate Market in Beijing

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Abstract: As a large-scale real estate industry, the real estate industry plays an important role in regulating the world economy. As a pillar industry in my country's development, it plays an important role in promoting my country's GDP growth. Consumption and investment demand for real estate also have a significant impact on overall consumer demand. Many scholars at home and abroad have conducted relevant research on real estate demand factors. This article uses annual data from the China Bureau of Statistics and Beijing, selects Beijing's GDP, per capita disposable income of all residents, etc. as explanatory variables, and uses the commercial housing sales area *sarea* as the explained variable. A multiple regression model was established to analyze the influencing factors of Beijing's real estate market demand. The results show that policy, income, population and housing price factors have a significant impact on demand. Among them, GDP, population change, and policy dummy variable factors have a positive impact, while housing prices and per capita income have a negative impact. Based on the conclusion, this article puts forward suggestions for narrowing the income gap, further curbing real estate speculation, maintaining a balance between supply and demand, paying attention to policy regulation, and using precise and powerful policies to regulate the entire industry, which has served as a reference for the development of the real estate industry.

Keywords: real estate, multiple regression model, Beijing, policy

1. Introduction

The real estate industry has always been an important engine for promoting my country's economic development. As a basic industry, the development and construction of any industry is inseparable from the real estate industry. The first reason is that the overall industry is large and involves a lot of funds, which has a direct promotion effect on economic development. Second, it involves a rich range of upstream and downstream industries and a wide range of designs. It covers everything from light industry to heavy industry, which can further stimulate the development of related industries. The taxes they pay are also the main source of government taxes, allowing the government to actively exert the socialist market control system, thereby promoting the development of infrastructure, medical security, social welfare and other aspects. In the financial industry, real estate is often used as collateral in mortgages and mortgage loans, promoting money creation and the establishment of a credit system, and stimulating overall consumer demand. Since 2016 to the present, the real estate industry has generally shown a continuous downward trend. With the positioning of the housing

market proposed by General Secretary Xi Jinping that "houses are for living in, not for speculation", the overall development of my country's real estate market is gradually slowing down. However, the real estate market still maintains considerable inertia, and housing prices remain high. In Beijing, due to the particularity of its location and status, the real estate market is often relatively stable. However, at the same time, it is easy to rise but difficult to fall, and housing prices are expensive. In recent years, with the growth of China's population and prosperous economy, GDP has steadily increased, and the urbanization process has continued to boost. At the end of 2021, the number of cities in the country reached 691, 34 more than at the end of 2012. Among them, there are 297 cities at the prefecture level and above, an increase of 8; and 394 cities at the county level, an increase of 26[1]. The increase in GDP has promoted the rise in housing prices[2], and at the same time, together with the increase in urbanization process, has promoted the development of China's real estate industry. Data from the National Bureau of Statistics show that in 2022, national real estate development investment was 13,289.5 billion yuan, a decrease of 10.0% from the previous year; of which, residential investment was 10,064.6 billion yuan, a decrease of 9.5%. At present, China's real estate market is developing rapidly and has a high return on investment, which has led to an excessive rise in housing prices and intensified the risk of price bubbles. The vacancy rate of houses in the domestic market is still high, and real estate companies develop blindly [3]. Beijing's housing market still shows great resilience. Against the background of the national downward trend, Beijing's commercial housing sales area reached 11.071 million square meters in 2021, a year-on-year increase of 14%, and the city's real estate development enterprises have 652.42 billion yuan in funds in place, a year-on-year increase of 12.1%. Overall, Beijing's real estate market is developing steadily, focusing on "houses for living, not speculation" and guided by "three stability" to make sure that the market stay healthy. Due to the dominant position of real estate in my country's economic development, it is very important to understand real estate policy. my country's real estate policy has gone through the following stages: From 2003 to 2008, the Central Bank issued a policy about managing real estate credit in June 2003, including restrictions on real estate development loans and land reserves. Within a few years they have also continued to exert pressure through policies such as increasing the down payment ratio of mortgage loans and reducing real estate transaction tax concessions, indicating that the industry is mainly negative regulation. From 2008 to 2009, because of the global financial crisis. there's a great descent in economy. The engine status of the real estate industry was once again emphasized, and the government initiated positive regulation. From 2009 to 2014, the rapid rise in housing prices caused the intensity of regulation to escalate again, and the real estate market turned from cold to warm, triggering regulation again. The State Council once again increased down payment ratios and business tax collection policies. Policy returns to negative regulation. From 2014 to 2016, the increase in real estate inventory and the slowdown in economic growth prompted the government to begin to support the demand for improved housing, and policy regulation started to play a positive role in the market. From 2016 to the present, the regional rolling increase in housing prices has caused the real estate industry to re-enter a negative regulation cycle. Under the main theme of housing for housing, not speculation, and city-specific policies, this negative regulation cycle of the real estate market involves more cities than in the past, and policies Stronger. It can be seen that the alternate introduction of positive and negative real estate policies provides a certain reference for subsequent research parameters. The supply and demand relationship in the real estate market plays an important role in controlling the industry situation and forecasting. Currently, there are many studies on supply and demand in the real estate market. Abroad, some Korean scholars have developed indicators for evaluating housing demand and provided the basis for subsequent research. Among them, twelve housing demand indicators are composed of three aspects, including 1. Demand triggering factors: including the number of new homes held, population migration, and ownerlessness. Property ratio. 2. Housing stock factors: including the proportion of housing supply, the number of

unsold properties, the number of transactions, and the number of affordable housing. 3. House purchasing power factors. In addition, the article mentioned that housing demand can be divided into five levels, while Korean real estate demand is in the third level [4]. Gallent et al. examine the solutions to the supply-side-driven housing crisis in the context of intensified demand-side pressures, housing financialization, credit liberalization shocks, and an influx of money generated by housing demand and prices. The conclusion points out that the root cause of the British housing crisis comes from uncontrolled investment demand and the monetary liquidity injected into the housing market by banks after deregulation [5]. Wang et al. selected micro-econometric data in 1999 and used a generalization of the two-stage Heckman estimation to correct the bias. In the first stage, a mixed logit model was used to study Spanish housing according to tenure types and buildings. It was found that there are differences in housing demand between owners and renters depending on the building type, and the income elasticity and demand price value of rental housing are larger [6]. Domestically, Zhang et al. have proven that online shopping can promote real estate demand [7]. Du et al. took Jiangsu Province as an example to study the housing impact demand in small cities in China. It divides housing demand into rental and purchase needs as well as consumption and investment needs. The results indicate that the demand for improvement and investment housing in Jiangsu Province exceeds the impact of basic consumption demand [8]. Liu Gang constructed a gray GM (1,1) model and a gray Verhulst model, and selected indicators such as per capita living area and Chongqing GDP to study the influencing factors of Chongqing's real estate market demand. The results found that the sales price of commercial housing, the annual completed area of housing, Chongqing GDP, the annual real estate development investment amount and the savings capacity of urban households are more obvious for market demand [9]. Wang Xing collected survey data and selected factors such as provident fund, education, financial assets, and household registration to establish a Logistic model to study the housing status and demand factors of Shanghai's youth employment population. The study found that the above four factors have a very significant impact on housing demand, and also made certain suggestions for policy formulation in terms of price system and security system [10]. Tsai selects data from Taiwan's real estate market and selects panel data from five major cities in Taiwan. It is revealed that rising house prices will lead to a decrease in housing affordability, which in turn will lead to a decrease in the demand for owner-occupied housing. The article further points out that changes in demand structure have led to an increase in the demand for investment housing. This change in demand structure increases the risk of price reductions and ultimately leads to lower housing prices [11]. It can be found that domestic and foreign scholars have conducted regression analysis on various indicators from the aspects of housing type, demand type, etc., and obtained the influencing factors of housing demand. However, there are still relevant gaps in the research on commercial housing demand in Beijing. As the capital of China, Beijing has special characteristics compared with other provinces in terms of policies, population structure, number of migrant population, per capita housing area, and per capita GDP. This report aims to establish a regression model through empirical analysis to analyze the factors affecting the demand for commercial housing in Beijing, thereby providing certain references and suggestions for the formulation of relevant government policies under the new population and industry structure.

2. Data and modeling

2.1. Variable selection

In previous paper studies, various scholars studied the factors affecting real estate market demand by selecting variables such as the total urban population, GDP, household savings capacity, and mortgage loan interest rates. This report selects relevant data from the National Bureau of Statistics and Beijing Statistical Yearbook. After stability testing and constructing a multiple linear regression

model, it finally selects Beijing's GDP (100 million yuan) and the per capita disposable income of all residents in Beijing from 2005 to 2021 (yuan), the average sales price of commercial housing price (yuan/square meter), the year-end permanent population pop (ten thousand people), the completed housing area carea (ten thousand square meters), and the policy dummy variable policy (0 and 1) as explanatory variables. Select commercial housing sales area sarea (10,000 square meters) as the explained variable. Among them, GDP plays a necessary role in evaluating the level of economy and has a certain impact on both the housing demand and supply sides. The per capita disposable income of all residents directly determines their purchasing power and expectations. The average sales price of commercial housing is an important indicator that affects demand during the buying and selling process. The permanent population at the end of the year affects the total demand for home purchases. The completed area of housing affects the total supply, which also has a certain effect on demand. As a new variable in this experiment compared with other experiments, the policy dummy variable mainly takes into account the uniqueness of Beijing as the political center. As the capital, Beijing is definitely the most efficient and complete in its feedback and implementation of policies. Therefore, this report divides Beijing's real estate policies into forward policies (1) and reverse policies (0). Through different regulatory cycles, we introduce dummy variables represented by each regulatory cycle into the model. In table 1, we've shown the values.

Table 1: Policy variables in each period

Time period selection	variable value
2005-2008	0
2008-2009	1
2009-2014	0
2014-2016	1
2016-2021	0

2.2. Data Processing

This report performs logarithmic processing on the average sales price of commercial housing, the per capita disposable income of all residents, and the permanent population at the end of the year. It performs differential processing on the sales area of commercial housing. The current year's value is the value of the current year minus the value of the previous year.

2.3. Model Establishment

This article uses a multiple regression model to construct the following equation:

$$\text{sarea} = \text{GDP} + \ln\text{price} + \text{carea} + \ln\text{income} + \ln\text{pop} + \text{policy} \quad (1)$$

Commercial housing sales area sarea appears as an explained variable to measure housing demand in Liu Gang and Wang Xing's articles. It can directly reflect the demand for commercial housing. This article takes its difference value and subtracts the current year's volume from the previous year's volume as the current year. Take value. GDP is the GDP of Beijing. lnprice is the logarithm of the average sales price of commercial housing. carea is the completed area of the house. lnincome is the logarithmic value of the per capita disposable income of all residents in Beijing, which is an important factor affecting residents' willingness to purchase houses. lnpop is the logarithm of the resident population at the end of the year. As the degree of urbanization has increased this year, the population

of urban residents has increased, which has directly affected the total demand for housing. policy is a policy dummy variable.

3. Results

3.1. Descriptive Statistical Values

This article generates descriptive statistical analysis on each variable, Table 2 shows the results.

Table 2: Descriptive statistics value table

variable name	mean	variance
sarea	-80.29	268816.6
GDP	21905	108557634
lnprice	9.87	0.284
carea	2396	439434.7
lnincome	10.561	0.226
lnpop	7.598	0.015

Among them, the mean value of the explained variable sarea is negative, which is consistent with the overall downward real estate market conditions in Beijing. The variance of the changes in the annual resident population is small, indicating that Beijing's permanent population fluctuates less between 2005 and 2021.

3.2. Stationarity Test

The tendency of economy systems should be figured out and predictable through the models. Predicting the future based on the history and current situation of random variables is the current basic idea for building regression models. The regression model is meaningful only when the characteristics of the random variables can ensure that they remain unchanged for a certain period of time in the future. If the data is not stationary which means there is no stable and sustainable state, then the assumption of having a prediction by analyzing data of history and current is wrong, and therefore regression is meaningless. Based on this, the stationarity test is very important. The results of the stationarity test of each data of this model through reviews are as follows in table 3.

Table 3: Stationarity test results

Variable name	The stationary order	Model	The lag item	t-test value	p-test value
sarea	0	With constant terms and time trends	1	-4.585	0.013
GDP	0	Constant term	0	-3.595	0.020
lnincome	0	Constant term	0	-4.437	0.004
lnprice	0	With constant terms and time trends	3	-4.743	0.013
lnpop	0	Constant term	2	-5.129	0.001
carea	0	With constant terms and time trends	2	-3.631	0.064

3.3. Regression Results

The influence coefficient obtained by regression is shown in Table 4. Among them, Beijing's GDP, permanent population changes and political factors have positive impacts on housing demand. Among

them, the impact coefficients of population and policies are larger and the impact is more significant. The $\ln income$, $\ln price$ and the $carea$ have a negative impact on demand, among which the $\ln income$ and $\ln price$ is more significant. The impact coefficient of income increase on housing sales area is negative. In a general economic sense, income growth tends to promote people's willingness to improve their housing. However, due to the positive effect of disposable income growth on prices, its positive effect on price growth may reduce residents' willingness to purchase real estate. When the latter effect is greater than the former, the income growth parameter may have a negative impact. Housing needs. The regulation of market demand by price is obvious. As the price increases, the demand decreases. There is also a direct relationship between population and housing demand. As population increases, the amount of housing required increases, and thus the total amount of housing demand increases. The impact of the newly added policy variables in this report on housing demand cannot be ignored. As mentioned above, Beijing's housing policy can be divided into multiple periods based on positive and negative policies. Positive policy (policy=1) has a strong impact on demand and is very significant. As Beijing is the political center, the implementation and effectiveness of policies in the local area can be fully guaranteed, thus ensuring the government's significant role in promoting and restraining real estate demand.

Table 4: Regression results

Variable name	estimated value	standard deviation	t-test value	p-test value
(Intercept)	2.578e+04	1.236e+04	2.086	0.064.
GDP	6.240e-01	1.968e-01	3.172	0.010**
$\ln income$	-1.421e+04	1.659e+03	-3.118	0.011*
$\ln price$	-5.173e+03	4.690e-01	-2.344	0.041*
$\ln pop$	2.158e+04	5.561e+03	2.555	0.029*
$carea$	-1.100e+00	7.907e+03	2.729	0.021*
policy	1.321e+03	3.204e+02	4.122	0.002**

Notes: $p < 0.001$ *** $p < 0.01$ ** $p < 0.05$ * $p < 0.1$.

4. Conclusion and Implications

The results show that the $\ln income$, the $\ln price$, the $\ln pop$ and policy have a greater impact on real estate demand. Among them, $\ln pop$ and policy have a positive impact on demand, while the $\ln income$ growth rate and $\ln price$ have a negative impact on demand. Based on the results, this report makes the following recommendations: 1. Narrow the income gap, further curb real estate speculation, and maintain a balance between supply and demand. At present, the overall wealth distribution in Beijing is uneven. According to Forbes statistics in 2021, Beijing has 100 billionaires, surpassing New York to become the city with the most billionaires in the world. The uneven distribution means that although the overall per capita income in Beijing continues to rise, a small number of high-income earners often choose to purchase multiple properties in full, and they also use them as investments in the hope that the price will be higher. Sell next. If ordinary residents have necessary housing purchase needs, they can only passively adapt to the rising housing prices. However, the economic pressure caused by it makes families can only reduce their needs in other aspects, which in turn inhibits the overall economic development of Beijing. Therefore, the income gap The reduction of investment demand and the reduction of investment demand play a vital role in maintaining a healthy real estate market, stabilizing housing prices, and improving residents' living standards. 2. Pay attention to policy regulation and use precise and powerful policies to regulate the entire industry. The regression verified the regulatory effect of Beijing's real estate policy on the real estate market. As the political center, Beijing is often the area where policies take effect first and are most effective. Under the

socialist market economy, the regulatory role of the government cannot be ignored today. At the same time, it can also play an important role in land use supervision and price control. Today, as urbanization progresses, the government should rationally plan land use, strengthen market supervision, strictly prohibit illegal land occupation, and ensure the stability of land prices. At the same time, reasonable tax policies should be formulated to curb the excessive speculative real estate demand of high-income earners, narrow the income gap, and thereby promote economic development. However, this experiment did not strictly prove the interpretation of the regression coefficient caused by income inequality, and the further mechanism of real estate policy was not clarified. At the same time, more examination of the role of variables is also a part of this article that is not fully covered, which can provide research directions for subsequent scholars.

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