



Research on the Influence Factors of Housing Price in China—Taking Changchun as an Example

Xincheng Zhu*

ACS International, Singapore, 699010

*Corresponding author. Email: 3447847484@qq.com

ABSTRACT

As a result of China's reform and opening, it entered a period of rapid economic growth, allowing the demand for housing to rise at a rapid pace since 1978 (the government approved the commodification of housing and land property rights). The commercialization of housing stimulates the citizens' needs for housing, which promotes economic growth, as many related industries boom. With the progress of housing commercialization, an outstanding issue of housing prices has gained billions' attention. The research will be conducted under theoretical and practical, that to explore what changes the housing price in the city of Changchun. It is undoubtedly that many factors indeed impact the fluctuation of housing prices. In this essay, five factors are selected, using the meth of GRA to detect their relations and propose several effective methods.

Keywords: *Fluctuations in house prices, Economic fundamentals; Grey Relations Analysis*

1. INTRODUCTION

Although in 1978 China's economy has shifted from a less efficient planned economy to a more efficient free-market economy, Jilin's economy has shown obvious changes in economic status, which has entered a turning point. Its economic advantages have been lost with the development of the southeast coastal area of China and the economic growth rate has also slowed down. After 1978, the economic development of Jilin began to gradually decrease below the national average provinces' GDP. By 2017, the percentage of the economy in the whole country fell even lower. All factors are indicating that since 1978 Jilin became a relatively lagging region in economic development in China.

When the Chinese government began to grow the real estate industry in 1978, all policies were gradually decentralized to Jilin Province. For example, the formation of the commercial housing market began this year, abrogated the editorial "Raise high the red flag of the People's Commune" (From the People's Daily on September 3, 1958.), housing reform policy and housing provident fund system that has been implemented in 1992, and the cancellation of the housing in-kind distribution system and the implementation of the mortgage policy in 1998. Even though these policies allow real estate investment to enter a period of steady and rapid development, due to Jilin's poor economic growth, huge

differences were shown between Jilin and other Southern Provinces.

Many scholars[1] believe that there have been two "leaps" in real estate in Jilin, 2008 to 2009 and 2015 to 2016. The leap from 2008 to 2009 benefited from the stimulus plan of 4 trillion yuan, and the plan opened the era of large infrastructure. The other leap from 2015 to 2016 benefited from the real estate destocking stimulus plan represented by the "330 New Deal". These two leaps have allowed the housing prices to quadruple in 2017 compared to 2007, much higher than the growth rate of economic development. However, they also believe growth is not sustainable because the new demand is already stretched.

2. CURRENT SITUATION

With the development of the nation's economic situation, it can be concluded that the real estate industry has been one of the biggest contributors to the development of the national economy. Since 1982, sales revenue of the real estate industry rocketed from 0 to 13.37 trillion, and the sales areas also rocketed from 0 to 1.69 billion square metre. It also suggested that the living area per person increased from 12 square metre to 40.8 square metre, and the urbanization rate rose from 20% to 58.2%. The high-speed developing economy support the

development of the real estate industry, which also contributes to the increase in housing price[2].

Changchun is the provincial capital of Jilin Province, and also is the largest and most developed city in Jilin. Analysis of the housing prices of Changchun can provide some effective suggestions not only for Changchun but also for the whole province. Based on the data of the statistical bureau of Changchun, Changchun's GDP in 2020 was nearly 663.8 billion Chinese Yuan, the increase rate was 3.6%, which still shows a trend of growth[3].

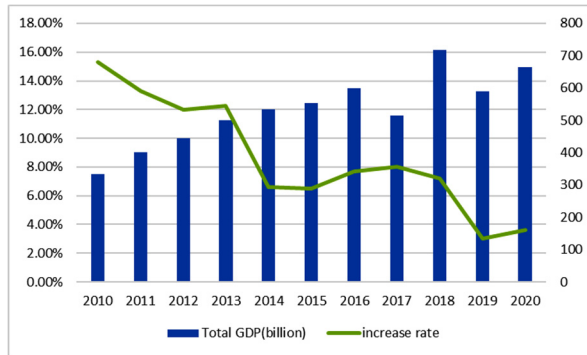


Figure 1. The total GDP and increase rate of Changchun from 2010 to 2020

The hypothesis of income in the consumption theory can reflect that income and consumption level show the same trend. Because of the dramatically increase of consumption of real estate, Chinese housing prices keep a trend of continuous rise, and the primary impetus is the level of urbanization and the rise of residents' income[4]. People's income and GDP per person can reflect the economic level of the city of Changchun, which decides the consumption level and the fluctuation of housing prices.

Based on the classical economic theory, it is concluded that a decrease in the supply of houses will cause a rise in house prices while an increase in the supply of houses will cause a decline in house prices. Haiwei Zhang(2009) suggested that the rise of Chinese housing prices clearly pulled by demand, by analyzing the sample statistics from 1998 season 1 to 2008 season 3 with methods of econometrics[5]. So the sales areas of houses and population also should be taken into consideration.

3. FACTORS

Within an overview of the market of real estate, it can be found that there are many factors influencing the fluctuation of housing prices. Some factors, such as population growth, will have a more direct impact on housing prices than others, while others will have a more gradual impact. It is important to identify the different factors and recognize their features so that it can provide some proper suggestions to help the steady development of this industry in Changchun. Based on the Statistical Yearbook of Changchun, five factors have been selected,

which can represent the aspects of demand and supply, economy, and society.

3.1 Investment in real estate

It is undoubtedly that the local investment in commercial houses can reflect the trends in local housing prices. Many commercial groups invested more capital in the real estate industry after they recognized the profit of this industry. At the same time, many real estate developers have a stronger desire to build nice amenities, extending their business influence as far as possible to influence housing prices [6].

3.2 Sales areas of commercial residential buildings

The housing prices in some cities like Changchun, which is categorized as a third-tier city, are influenced by the ratio of supply and demand. The supply of houses especially the sales areas of commercial residential buildings can show the direction of market development.

3.3 Disposable income

Disposable income is a key factor to analyze residents' consumption, and also can analyze the housing prices. The increase or decrease of people's disposable income, will promote or restrain people's purchasing demand and purchasing ability[7]. In this way, it will impact the housing price policies made by real estate developers.

3.4 GDP per person

GDP per person is an important factor that can reflect the level of economic development in local areas. Changchun's data on GDP per person can provide the references for real estate investors, governments, and buyers, so it can cause the fluctuation of housing prices.

3.5 Population

The level of population can decide the demand for houses, so the population is also an important factor. Surplus rural labour flocked in cities due to the quick development of agricultural productivity[8]. The birth rate, death rate, immigration rate, and some other rates will influence the population at the year-end, which will influence the housing demand and trading volume and then influence the housing prices. By analyzing these factors, it can be found.

4. ANALYSIS OF CHANGCHUN'S HOUSING PRICE

4.1 Data

These data are selected from the Yearbook of Changchun, and the statistical communiqué of the National economy and social development of Changchun. Because many factors can affect the change in housing prices, this essay selected 5 main factors: investment in real estate, sales areas of commercial residential buildings, disposable income, GDP per person and population. Also considering the accessibility and completeness of data, the period of data selected is 2010~2019.

The method of GRA is a relatively simple analyzing method, which can get a reliable result from relatively small samples of data. So, this essay takes the method of GRA to analyze the data.

4.2 The steps of GRA methods

Analysis of the selection of numbers. Select the numbers, determines the reference sequence(noted as X0) and comparison sequence(noted as X1,X2,X3....Xn)

Pre-processing the variables. Normalizing these variables, elements be processed as follows:

$$x_i(j) = \frac{x_i'(j)}{\frac{1}{n} \sum_{j=1}^n x_i'(j)} \quad (i \in [0, m]) \quad (1)$$

Calculating the relevant ratio between the reference sequence and comparison sequence, noted as a and b,

$$\begin{aligned} a &= \min_i \min_k |x_0(j) - x_i(j)| \\ b &= \max_i \max_k |x_0(j) - x_i(j)| \end{aligned} \quad (2)$$

A is the minimum difference, and b is the maximum difference($i=1,2,3,\dots,m, j=1,2,\dots,n$)

$$Y(X_0(j), X_i(j)) = (a + pb) / |X_0(j) - X_i(j)| + p \cdot b$$

P is distinguishing coefficient, it is suggested that $p=0.5$ [9]

Calculated grey relation grade (GRG) by this formula:

$$y(x_0, x) = \frac{1}{n} \sum_{j=1}^n y(x_0(j), x_i(j)) \quad (3)$$

4.3 Analysis of the GRA results

The rank of factors is: Sales areas of commercial residential buildings > disposable income > GDP per person > Population amounts > investment in real estate.

Table1. Normalized data of influenced factors of housing price

Year	Average price of Commercial houses	Disposable income	GDP per person	Investment on real estate	Sales areas of commercial residential buildings	Population amounts
2010	0.7971	0.6746	0.6224	0.9795	0.8751	1.0057
2011	0.9336	0.7712	0.7458	1.2007	0.8932	1.0096
2012	0.8247	0.8646	0.8314	1.1705	0.9206	1.0031
2013	0.8960	0.9800	0.9412	1.1055	0.8588	0.9975
2014	0.9144	0.9000	1.0042	0.9628	0.7693	1.0000
2015	0.9969	1.0950	1.0387	0.9117	0.8219	0.9990
2016	0.9412	1.0237	1.1252	1.0750	1.0318	0.9979
2017	1.0652	1.0933	1.2248	1.0337	1.1629	0.9926
2018	1.2654	1.1731	1.3551	1.4028	1.3058	0.9953
2019	1.3655	1.4245	1.1114	0.1580	1.3606	0.9992

Table2. Grey rational coefficient

Year	Disposable income	GDP per person	Investment on real estate	Sales areas of commercial residential buildings	Population amounts
2010	0.6062	0.5177	0.5070	0.7098	0.4730
2011	0.5362	0.4995	0.4116	0.8288	0.7151
2012	0.8307	0.9763	0.3503	0.6641	0.5126
2013	0.6936	0.8115	0.4719	0.8411	0.6509
2014	0.9376	0.6790	0.8004	0.5644	0.6895
2015	0.6587	0.8238	0.6906	0.5175	1.0000
2016	0.6975	0.5046	0.5847	0.6769	0.7725
2017	0.8772	0.5406	0.8635	0.6598	0.7246
2018	0.6727	0.6791	0.5780	0.8287	0.4088
2019	0.7650	0.4237	0.1332	0.9855	0.3373

Table 3. Grey relation grade

Disposable income	GDP per person	Investment on real estate	Sales areas of commercial residential buildings	Population amounts
0.7276	0.6456	0.5391	0.7277	0.6284

4.4 Analysis of these factors

It is surprising to find that sales areas of commercial residential buildings have become the most important factor to influence the housing price. As a result, the fluctuation of housing prices in Changchun is primarily influenced by the relationship between demand and supply.

The disposable income of citizens is a vital factor influencing housing prices. When people get more disposable income, buying houses as a kind of investment has become a habit. With the increase in people's disposable income, housing prices also rise.

GDP per person can reflect economic development. It can be found that the GDP per person in Changchun shows a trend of increase, which will promote people's demand and purchasing ability. The rise of demand also promotes the rise of housing prices.

With the development of the city, the population of Changchun become larger. The increase in population creates more demands for houses and also consuming power. For example, the rise in the number of households

that have children, taken as an indicator of population, causes the rise of houses in school districts.

The investment in real estate in Changchun also shows a trend of increase. The rise in housing prices attracts more investors to put more money in Changchun, and develop more buildings, which enlarges the supply of houses. In the end, it affects the change of houses.

5. SUGGESTIONS

The health development of real estate can reflect the level of a city's development. The government of Changchun should take the role to make the sustainable development of real estate by conducting related policies. At the same time, punishments should be taken to control the flips, to make sure the health relation of supply and demand of houses.

Government must increase people's income by promoting the development of the local economy. Although the citizen's consumption power will be affected by their income, the government should help citizens gain more income and have a better living condition.

It is also very clear that people's needs vary with their ages' changing, which impacts the housing development. Thus, optimizing population structure benefits not only the steady development of real estate markets but also the long-term development of the entire city.

6. CONCLUSION

This essay analyzes the housing prices change in the city of Changchun by GRA methods. We get a relatively objective conclusion by sequencing the selected five factors. It finds that sales areas of houses and disposable income have become the most important influencing factors. The paper also comes up with some possible suggestions to help the healthy development of the real estate industry in Changchun. It is a truth that many other factors do influence the fluctuation of housing prices, and the selected five factors cannot highly include all the factors, which can be seen as the limitation of this essay.

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