Determination and Countermeasures of Real Estate Market Bubble in Beijing

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Abstract. In recent years, the real estate market price is staying at a high level. This thesis makes a deeply research on what it influences China’s economic development and social stability. The thesis studies the real estate market price bubble in Beijing by Ramsey model, from the thesis, we can find the serious problems about the market bubble and put forward countermeasures and suggestions in dealing with it for the government, real estate business and residents.

Keywords: Real estate, bubble, determination, countermeasures.

Research Background

In recent years, with the growing prosperity of the real estate market, the most talked about is the “bubble” and the house prices. Being the capital of our country, Beijing has made great progress about its real estate, and the real estate has become the city’s important pillar industry. With the development of the industry, Beijing’s housing prices have also appeared too fast and too high growth. Therefore, it’s very important to research on speculative bubbles in the current Beijing’s real estate market.

Situation of Real Estate in Beijing

In recent years, China’s real estate is very hot, especially Beijing’s is very high. The total social fixed assets investment was about 329.638 billion yuan in Beijing in 2006, but in 2015, it is 746.602 billion yuan, Increased by 2.5 times than 2006. From 2006 to 2015, in Beijing, the real estate development
investment than the social fixed asset investment is equal to more than 50%, and it’s showed that Beijing real estate development investment has a phenomenon of overheating according to international standards (10%). From 2006 to 2015, the construction area of the real estate commodity house in Beijing had increased from 10483.5 million square meters in 2006 to 13095.49 million square meters in 2015, the completed area had increased from 3193.89 million square meters in 2006 to 2631.5 million square meters in 2015, the sales area had increased 2607.62 million square meters in 2006 to 1554 million square meters.

For 10 years, it seems that the construction area, the completed area and the sales area have little growth, however it has increased in 2016 by 24% over in 2016 about the area for developing, and it has decreased by 41.31% in the past decade about the sales area. Therefore, it’s showed that supply is greater than demand, and a lot of vacant houses have appeared.

Since 2000, housing prices in Beijing have risen rapidly. The average selling price of the country’s houses in 2000 was 2112 yuan per square meter, and it’s 4919 yuan per square meter in Beijing. But in 2015, the house prices had risen to 60,000 yuan per square meter in the center of Beijing.

While the average selling price of commercial housing in Beijing continues to soar, the people’s income growth is slower relative to house prices. In 2015, Beijing real estate average selling price was 30,012 yuan per square meter, purchasing a set of 100 square meters of housing, a family of three that per capita disposable income was 40,000 yuan needs three million Yuan, It seems that the house price is 20.6 times than the annual income of the family, that is higher than reasonable range (three to six times) of the World Bank approved.

**Model Selection**

Firstly, we measured the real value of the real estate market by using the Ramsey model in macroeconomics.

\[ f(k) = r+n \] (1)

Where \( r \) is time preference, which we can be replaced by the interest rate, and \( n \) is population growth rate. According to the formula, we can know the real value of the real estate market is closely related to interest rates and population growth rates. Basically, \( f(k) \) has been know as the true value of the real estate market. According to the formula, we can calculate the real value of the real estate market, and it must be eliminated the impact of price factors on the basis of the above.

\[ f = r+n-\pi \] (2)

\( \pi \) is inflation rate, replaced by cpi price index. Then, we can calculate the ratio of bubble by the real value and the real estate market.

The ratio of Real estate market price:
$$b_i = \left( p_i - f_i \right) / f_i$$

$b_i$: the real estate market price bubble degree in the $i$ time.

$p_i$: the real price of the real estate market in the $i$ time.

$f_i$: the basic value of the real estate market in the $i$ time.

So, we chose the (2). Some variables must be explained during the determination, especially some are hard to find variables that match the model in real life. Firstly, determination of inflation index. There are many indicators can explain the inflation index in real life, and cpi consumer price index, which is closely related to our typical representative of inflation index, is represented by the inflation index in the thesis.

$$\pi_i = (\text{cpi}_i - 100)\%$$

$c_{pi}$: consumer price index and $\pi_i$: inflation rate.

Secondly, the population growth rate is selected according to the natural population growth rate released by the National Bureau of Statistics. Thirdly, $r$ is consumer preference, which is expressed in interest rates in real life. It will choose two rates that are minimum interest rate, which is selected year average deposit interest rates, and maximum interest rate, which is selected deposit interest rates over a five-year period. By using the maximum and minimum interest rates, we can find the real estate market real value of a range to define a range of real estate market price bubbles, and then research whether the real estate market price bubble in this market will not run in this range. If it is, no bubble, on the contrary, nor is it.

Table 1. The Criterion of Real Estate Bubble.

<table>
<thead>
<tr>
<th>Value range of $p$</th>
<th>$p &lt; f_{l}$</th>
<th>$f_{l} \leq p \leq f_{h}$</th>
<th>$p &gt; f_{h}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bubble Condition</td>
<td>not exist</td>
<td>not exist</td>
<td>exist</td>
</tr>
<tr>
<td>Comment.</td>
<td></td>
<td>the market is undervalued</td>
<td></td>
</tr>
</tbody>
</table>

Comment. $p$-actual price. $f_{l}$-the smallest possible marginal rate of return (no bubble running range lower limit). $f_{h}$-the maximum possible marginal rate of return (no bubble running range upper limit).

Fourthly, real estate market price choice. Select the average selling price of real estate for the actual real estate market prices, and in the thesis choose a relative price for real price evaluation. So real estate prices are selected by the real estate price chain development speed in the thesis.

$$p_i = (\text{spi}_i - 100)\%$$  \hspace{1cm} (3)

$p_i$: a specific period of sales price index year on year growth rate, and in the thesis it’s on behalf of the real estate market in the region the actual price. $\text{spi}_i$: average sales price index of commercial housing in the $i$ period.
Model Establishment and Analysis

According to the above model, we do the determination of the price of the real estate market in Beijing and select data for 2006 to 2015. According to annual data for the four indicators that are $r_l$, $r_h$, cpi and $n$ in Beijing 10 years period, we can get the real estate real value of the maximum and minimum, and then with 10 years of real estate market prices $p$ are compared to get 10 years of real estate market price bubble index. The calculation form is as follows.

Table 2. The Beijing real estate market price bubble calculation table.

<table>
<thead>
<tr>
<th>t</th>
<th>$r_l$</th>
<th>$r_h$</th>
<th>$\pi$</th>
<th>$n$</th>
<th>$f_l$</th>
<th>$f_h$</th>
<th>$p$</th>
<th>$b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>0.72</td>
<td>3.78</td>
<td>0.9</td>
<td>0.528</td>
<td>0.348</td>
<td>3.408</td>
<td>22</td>
<td>5.46</td>
</tr>
<tr>
<td>2007</td>
<td>0.76</td>
<td>4.93</td>
<td>2.4</td>
<td>0.517</td>
<td>-1.123</td>
<td>3.047</td>
<td>39.54</td>
<td>11.97</td>
</tr>
<tr>
<td>2008</td>
<td>0.66</td>
<td>5.62</td>
<td>5.1</td>
<td>0.508</td>
<td>-3.932</td>
<td>1.028</td>
<td>7.48</td>
<td>6.28</td>
</tr>
<tr>
<td>2009</td>
<td>0.36</td>
<td>3.6</td>
<td>-1.5</td>
<td>0.487</td>
<td>2.347</td>
<td>5.587</td>
<td>11.12</td>
<td>0.99</td>
</tr>
<tr>
<td>2010</td>
<td>0.36</td>
<td>3.7</td>
<td>2.4</td>
<td>0.479</td>
<td>-1.561</td>
<td>1.779</td>
<td>28.86</td>
<td>15.22</td>
</tr>
<tr>
<td>2011</td>
<td>0.46</td>
<td>5.275</td>
<td>5.6</td>
<td>0.479</td>
<td>-4.661</td>
<td>0.154</td>
<td>-5.23</td>
<td>0.108</td>
</tr>
<tr>
<td>2012</td>
<td>0.43</td>
<td>4.6</td>
<td>3.3</td>
<td>0.495</td>
<td>-2.375</td>
<td>1.795</td>
<td>1.007</td>
<td>-1.424</td>
</tr>
<tr>
<td>2013</td>
<td>0.35</td>
<td>4.75</td>
<td>3.3</td>
<td>0.441</td>
<td>-2.509</td>
<td>1.891</td>
<td>8.997</td>
<td>3.76</td>
</tr>
<tr>
<td>2014</td>
<td>0.35</td>
<td>4.75</td>
<td>1.6</td>
<td>0.483</td>
<td>-0.767</td>
<td>3.633</td>
<td>1.51</td>
<td>-0.584</td>
</tr>
<tr>
<td>2015</td>
<td>0.35</td>
<td>4.75</td>
<td>1.8</td>
<td>0.402</td>
<td>-1.048</td>
<td>3.352</td>
<td>59.36</td>
<td>16.70</td>
</tr>
</tbody>
</table>

![Figure 1. The real estate market price and basic value of Beijing.](image)

As we can see from the above figure, most of the time, housing price was in a rapidly rising stage and the real estate market bubble was serious in Beijing form 2006 to 2015. Only in late 2010 to the first half of 2011, the real estate market prices returned to a reasonable range. In the 10 years, which we study, Beijing housing price changes are as follows.
The first cycle is the first two years in 10 years, house prices is in the rapid growth stage. The first year the real estate price index was 22 and it was 39.54 in 2007. So at this stage, we can find the real estate market was in the rapid development and from the price point of view, the actual real estate pieces and basic value deviation is very large.

The second cycle is from 2007 to 2009, it’s the real estate market prices fall and maintain a stable period. With the real estate market to strengthen the macro-control measures from “The State Council's No.10 National notice”, the real estate market prices were declining from the second half of 2007 to the second half of 2008 that the prices fell from 39.54 in 2007 to 7.48 in 2008. However, this stage of real estate prices were still very serious, just it was a slight drop in the bubble. This stage had been maintained until the second half of 2009. The real estate market price was 11.98 in 2009 and it was slightly higher than in 2008.

The third cycle is from 2009 to 2010, it’s a period that the real estate market prices rise rapidly. The house price is in rational return in 2008. However, with the national loosening the policy, the real estate market prices was slowly rose up in 2009. To the end of 2010 Beijing real estate market price reached 28.86.

The fourth cycle is from 2010 to 2014, house prices fell to a stable period of rational development. Since the implementation of “The State Council's No.10 National notice”, Beijing real estate prices fell in 2011. It was the first time that the return to absolute prices fell; the price, since 10 years, which was -5.23, in 2011. Afterwards from 2011 to 2014, house prices were reasonable return, the real estate price was 1.007 in 2012 and it was 8.997 in 2013. It’s showed that house prices have a small increase. And the price was 1.51, it’s showed that the market is still waiting to see. In this period, have successfully implemented the rapid and stable development of the real estate market.

The fifth cycle is from 2014 to 2015. After more than four years on the sidelines, Beijing real estate had entered a fast-growing and reached the historical high of Beijing housing prices, the prices had increased from 1.51 in 2014 to 59.36. During this period, the market price seriously deviated from the underlying value.

According to the above information, we can draw the operating curve of Beijing’s real estate market price bubble at this stage. The chart describe the Operating Curve of Beijing’s real estate market price bubble from 2006 to 2015. The analysis is as follows.

Firstly, it is high bubble operation of Beijing real estate market in the last decade, especially between the 2006 with 2011. The price bubble is far higher than the national average. For example, in 2006, the data is 5.45, and the data reached 11.98 in 2007, the index reached 6.28 in 2008, the index reached
15.23 in 2010 and it was a little better in 2013 that reached 3.76. The most terrible is in 2015 that the index reached 16.7 which was the highest level. In 2011, 2012 and 2014, it is basically no bubble to run.

Secondly, Beijing The bubble degree is related to the policy of regulating the real estate. In the severe policy of regulating the real estate, the bubble degree is lower, on the contrary, the index retaliatory rebound. But once the policy is over, the indicators have a new round of rising, for example, the index reached 16.7 which was the highest level in 2015.

![Figure 2. The Operating Curve of Beijing’s real estate market price bubble from 2006 to 2015.](image)

**Policy Suggestion**

The price bubble of real estate will hurt the social stability, economic development. The bursting of real estate price bubble will bring serious social problems. Therefore, it is the time to take measures to suppress the real estate market price bubble. The following measures is more effective. It is including strengthen macro-control and management, reforming the land transfer system and the management of land resources, promoting the construction of affordable housing, regulating the real estate tax system, improving the real estate market, information disclosure system, the supervision of real estate finance, developing the capital markets, broaden investment channels and so on.

**References**