Urban Housing Markets in China

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Abstract

This thesis focuses on problems of prices and risks in the housing markets of urban China. What drives the dynamics of housing prices across regions is not only of great interest for academic researchers but also of first importance for policy makers. It is also interesting to pay attention to the issue of housing bubbles at a city level and risk allocations from an institutional view. To address the issues, the thesis applies both qualitative and econometric approaches in analyzing the urban housing markets of China.

The first paper reviews articles mainly published in Chinese core journals. The existing studies are mainly concerned with such six topics as institutions, policy, land, finance, price and market. The first three topics involve the public housing allocation system reform, such fiscal and monetary tools as tax and interest rate, and the land reserve system. The housing finance treats such subjects of mortgages, bubbles and financial systems, while housing prices explore factors such as land prices, construction cost and exogenous forces like income. Finally, the housing market addresses housing circles and the relationship between housing demand and supply.

In paper 2, the housing price dynamics is investigated at a national level and across regions by using the panel data with 30 provinces over 7 years (2001-2007). The empirical results suggest that the estimates for the fundamentals of income, user cost, housing stock and employment are robust at a national level, implying that there exists a stationary equilibrium relation in the long run between the housing price and the fundamentals above. The speed of price adjustment varies considerably across regions in the East, Midland and West.

Then the housing markets in Beijing and Shanghai are examined in Paper 3 to quantify possible existence of a bubble in the two metropolitan areas. This article uses an integrated strategy involved with such fundamentals as interest rates, rent, income and GDP. The results show that Beijing might have been on the way of forming a housing price bubble between 2005 and 2008, and that there possibly existed a bubble in Shanghai from 2003 to 2004.

By comparing the risk allocation in China with that in Sweden, Paper 4 explores the difference of actual risks taken by various actors. The banks and governments appear to take more risks in China, especially as the Chinese developers have a weaker financial situation than in Sweden. Households have more choices to reduce the risk by purchasing various kinds of insurance products and also by binding the interest rate.

Keywords: Housing price, Bubble, Region, Error correction model, Control Chart, Income, Rent, Mortgage, Risk allocation.
Acknowledgement

I owe my sincere gratitude to my supervisor Professor Björn Hårsman from whom I have learnt a lot about the skill and knowledge of doing research. His support, guidance and questioning have kept me on the right trajectory during my doctoral study. I am also deeply grateful to my co-supervisor Professor Hans Lind for his valuable suggestions of the outline of the papers and careful comments on the papers through my research, and also for co-authoring Paper 4. Many thanks to both supervisors for the careful and patient proof reading that has improved the language of the thesis.

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Warm thanks also to Gunilla Appelgren and Katarina Lilja and many people in the Dean office of the school and the Division of Building and Real Estate Economics, who have always been hospitable and kindly helpful with practical matters.

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Stockholm, October 26, 2009

Yongzhou Hou
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Introduction and overview

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Background

China began its historic reform shifting to a market economy from a centrally planned economy in 1978. Since then China has also been reforming its policy framework for land and housing markets. However, though a series of reform policies successively were implemented, it took till 1998 before a housing market of the current kind was established. In that year, the Chinese government launched a new housing policy, replacing the planning and welfare based allocation system with a market-oriented allocation system.

In China, the central state government decides upon the basic tenets of the housing policy and related institutions. The local governments or municipalities are responsible for implementing the policies outlined by the state and for deciding upon additional regulatory measures adapted to local conditions. For instance, local regulations may include measures such as the management of Housing Accumulation Funds. In 2009, the municipality of Nanjing, a city in the eastern China, issued a local regulation that, if a couple already owns a housing unit more than 140 square meters and want to buy another one, the individual maximum loan with Housing Accumulation Funds is decreased to 150 thousands Yuan from the earlier 300 thousands Yuan. By contrast, Hangzhou, another city in the eastern China, has the local policy that the individual maximum loan with Housing Accumulation Funds is up to 500 thousands Yuan. It appears that cities are the most important actors at lower levels of governments. The outlined power division implies that policy shifts at the national level have a great local impact and that local policies differ considerably since the economic and demographic conditions vary widely both across and within different provinces.

Housing types

In urban China, housing or dwelling units include common apartment housing, high-quality apartment housing, villas, and economically affordable housing. Table 1 presents the building types by floor space sold. The common apartment housing refers to dwellings composed of tens or hundreds of apartments in a building without any fitment, while high-quality apartments are ready with fitment for moving in anytime. Villas are equivalent to detached or semi-detached houses. High-quality apartments and villas are mainly constructed and marketed for high-income households and sell at much higher prices than the common apartment housing. In terms of the definition by National Bureau of Statistics of China, economically affordable housing is a term used to describe the subsidized dwelling units affordable to low-income households. It is a kind of public housing subsidized by the government. The cost and selling price of such housing is
much lower than for common apartment housing, as developers enjoy preferential tax policies and pay less for the land. As shown in Table 1, the common apartment housing dominates the housing market. For instance, they accounted for 88% of residential building sold in 2007.

Table 1. Types of Buildings Sold in Urban China

<table>
<thead>
<tr>
<th></th>
<th>Sq. m (in millions)</th>
<th>% of All Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Buildings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Apartment Housing</td>
<td>121.7</td>
<td>620.5</td>
</tr>
<tr>
<td>Villas, High-quality Apartment Housing</td>
<td>6.4</td>
<td>45.8</td>
</tr>
<tr>
<td>Economically Affordable Housing</td>
<td>37.6</td>
<td>35.1</td>
</tr>
<tr>
<td>Nonresidential Buildings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>4.4</td>
<td>14.7</td>
</tr>
<tr>
<td>Commercial</td>
<td>14.0</td>
<td>46.5</td>
</tr>
<tr>
<td>Other</td>
<td>2.3</td>
<td>11.1</td>
</tr>
<tr>
<td>All Buildings</td>
<td>186.4</td>
<td>773.6</td>
</tr>
</tbody>
</table>

New housing

During the process of moving toward the market system, most housing units built before 1980 have gradually been dismantled or rebuilt because of old-fashioned design or bad quality, particularly in the most central and desirable inner city locations. Although it is difficult to assess the quality of the housing supply data, about 50% of the current housing stock has been constructed after 1998. In contrast to Western countries, where the yearly construction typically amounts to a small part of the housing stock, new construction appears to play a much more important role for the development of housing prices and the housing markets in China than in Western countries. Moreover, because of the influence of traditional culture, most households, especially young couples who are the major group with purchasing power of housing, preferred to buy newly completed rather than second-hand housing during the last decades. Therefore, given the lack of access to housing stock data, the thesis focuses on new housing.

Tenure issue

In China, deeply influenced by traditional lifestyle or culture for thousands of years, people prefer to buy housing rather than rent when a new family is formed. Usually, a household is not regarded as having settled down by close relations or friends until they
have their own housing. In addition, once having purchased their own housing in a city, few households move to other cities for work or recreational opportunities. A relevant issue is that land in China is totally owned by the state rather than private households. Households have the ownership of housing they purchased, but not of the tract over which the housing is built. As for the tract, households only have the user right with the maximum tenure for 70 years, and this tenure can be expanded automatically after expiration only if it is not at variance with the legal regulations.

**Housing supply and demand**

Figure 1 traces the housing supply and demand in urban China. The floor space of newly completed housing has exceeded that of housing sold each year from 1998 to 2006 but the gap has decreased successively and in 2007 more units were sold than completed. The gap might reflect strategic or speculative behavior among developers. In the face of increasing demand and increasing house prices they would benefit from waiting a period before offering the completed housing for sale. If this is the case, then the reversal of the gap in 2007 might indicate a faster demand and price growth rates.

As it usually takes about two years for developers to complete a house after starting construction, this might explain why the number of housing starts is still exceeding the number of units sold. If the developers envisage the demand growth rate to slow down after 2007, the number of housing starts is likely to decrease to adapt the gap between housing starts and housing sold. If the hypothesis about strategic behavior among developers is correct, it seems evident that the demand for housing has been a major driving force for China’s urban housing markets since 1998. This conclusion is strengthened by the result that the annual 25% growth of housing sold is greater than the annual 15% growth of housing completed and the annual 22% growth of housing starts.

![Figure 1: Housing Supply and Demand in urban China](image-url)
Regional changes

The housing prices have increased considerably in the three major regions of China during the last decade as shown in Figure 2. From 1995 to 2007, the housing price in the East has increased with 138%. The price trajectory of the other two regions falls clearly below the national trend but still the housing price increased with 124% in the Midland and 97% in the West.

![Figure 2. Change of Nominal Housing Prices](image)

A more detailed overview of indicators reflecting housing market changes is given in Table 2. The table presents GDP per capita in 2007 and data concerning employment changes, household formation and the growth of housing prices for each one of China’s 31 provinces from 1998 to 2007. The East is the richest and most expansive area and has absorbed employment that comes mainly from the Midland.

The number of households has increased and the average household size has decreased in all provinces. The economic strength vary widely across regions, with the maximum GDP of 66 thousands Yuan per capita in Shanghai and the minimum of 6.9 thousands Yuan per capita in Guizhou. The regions with the per capita GDP above 25 thousands Yuan are almost all in the East.
### Table 2: Regional patterns in changes of various housing indices, 1998-2007

<table>
<thead>
<tr>
<th>Region</th>
<th>Per capita GDP&lt;sup&gt;(a)&lt;/sup&gt; (Yuan) (2007)</th>
<th>Employment Number</th>
<th>Employment Size</th>
<th>Housing price&lt;sup&gt;(a)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Total</td>
<td>-</td>
<td>9.0%</td>
<td>20.8%</td>
<td>-12.7%</td>
</tr>
<tr>
<td>East</td>
<td>-</td>
<td>50.4%</td>
<td>25.3%</td>
<td>-12.9%</td>
</tr>
<tr>
<td>Shanghai</td>
<td>66367</td>
<td>47.2%</td>
<td>43.3%</td>
<td>-13.4%</td>
</tr>
<tr>
<td>Beijing</td>
<td>58204</td>
<td>72.3%</td>
<td>39.6%</td>
<td>-12.5%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>46122</td>
<td>-2.0%</td>
<td>25.1%</td>
<td>-10.7%</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>37411</td>
<td>133.9%</td>
<td>23.6%</td>
<td>-10.7%</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>33928</td>
<td>70.3%</td>
<td>20.1%</td>
<td>-12.8%</td>
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<tr>
<td>Guangdong</td>
<td>33151</td>
<td>86.3%</td>
<td>47.8%</td>
<td>-18.3%</td>
</tr>
<tr>
<td>Shandong</td>
<td>27807</td>
<td>32.3%</td>
<td>18.0%</td>
<td>-9.5%</td>
</tr>
<tr>
<td>Fujian</td>
<td>25908</td>
<td>59.7%</td>
<td>28.8%</td>
<td>-16.0%</td>
</tr>
<tr>
<td>Liaoning</td>
<td>25729</td>
<td>3.7%</td>
<td>17.1%</td>
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</tr>
<tr>
<td>Hebei</td>
<td>19877</td>
<td>-3.5%</td>
<td>18.3%</td>
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<td>Hainan</td>
<td>14555</td>
<td>31.7%</td>
<td>32.0%</td>
<td>-15.0%</td>
</tr>
<tr>
<td>Midland</td>
<td>-</td>
<td>-3.4%</td>
<td>16.8%</td>
<td>-12.3%</td>
</tr>
<tr>
<td>Jilin</td>
<td>19383</td>
<td>-22.6%</td>
<td>17.9%</td>
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<td>Heilongjiang</td>
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<tr>
<td>Shanxi</td>
<td>16945</td>
<td>6.2%</td>
<td>17.0%</td>
<td>-8.2%</td>
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<tr>
<td>Hubei</td>
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<td>Henan</td>
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<td>Hunan</td>
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<td>Jiangxi</td>
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<tr>
<td>Anhui</td>
<td>12045</td>
<td>1.0%</td>
<td>21.1%</td>
<td>-16.9%</td>
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<tr>
<td>West</td>
<td>-</td>
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<td>19.3%</td>
<td>-13.1%</td>
</tr>
<tr>
<td>Inner Mongolia</td>
<td>25393</td>
<td>-4.1%</td>
<td>22.6%</td>
<td>-15.2%</td>
</tr>
<tr>
<td>Xinjiang</td>
<td>16999</td>
<td>12.3%</td>
<td>39.8%</td>
<td>-13.2%</td>
</tr>
<tr>
<td>Chongqing</td>
<td>14660</td>
<td>25.3%</td>
<td>7.4%</td>
<td>-13.1%</td>
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<tr>
<td>Ningxia</td>
<td>14649</td>
<td>21.2%</td>
<td>30.0%</td>
<td>-11.7%</td>
</tr>
<tr>
<td>Shaanxi</td>
<td>14607</td>
<td>7.6%</td>
<td>28.1%</td>
<td>-16.6%</td>
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<tr>
<td>Qinghai</td>
<td>14257</td>
<td>27.6%</td>
<td>32.0%</td>
<td>-16.1%</td>
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<tr>
<td>Sichuan</td>
<td>12893</td>
<td>27.6%</td>
<td>13.0%</td>
<td>-12.7%</td>
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<tr>
<td>Guangxi</td>
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<td>20.2%</td>
<td>-15.0%</td>
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<tr>
<td>Yunnan</td>
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<tr>
<td>Gansu</td>
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<td>3.7%</td>
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<td>-11.1%</td>
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<tr>
<td>Guizhou</td>
<td>6915</td>
<td>14.1%</td>
<td>23.3%</td>
<td>-14.1%</td>
</tr>
</tbody>
</table>

Notes:<sup>(a)</sup> means that the data are in nominal values.

<sup>1</sup>The regions in this table are ranked in order of per capita GDP.
Purpose

The housing sector has played an increasingly important economic role in the rapidly expanding and urbanizing Chinese economy during the last decade. In spite of this, the knowledge is rather fragmented concerning the major forces driving the housing markets in different parts of China. Given the rapid housing price increases, the housing finance system, and so forth. A literature overview of what is known about the Chinese housing market would be most welcome. As a small step in that direction it is one aim of this thesis to shed some light upon the different kind of research results related to the Chinese housing market that have been published over the period 2000–2008.

In view of the development discrepancy between different parts of China as illustrated in Figure 2 and Table 2 above, another purpose of the thesis is to provide further knowledge about the relationship between housing price development in different regions and the related changes in basic demand and supply factors. To do this, the error correction model based on the stock-flow method is employed to examine the regional housing price dynamics in urban China.

The high growth rate of the Chinese economy over the last decades, the parallel urbanization and the major housing policy change in 1998 have resulted in rapidly increasing urban housing prices across regions as indicated in Figure 2 above. However, as shown later in Paper 3, such local areas as Beijing and Shanghai have experienced quite significant price fluctuations during the last decade. The price increases are probably dynamically related to a number of factors such as GDP growth, urbanization rates, change in the availability of credits and so forth. Strategic or speculative behavior by developers might be another important contributing explanation. Against this background, the third aim of this thesis is to assess the likelihood of urban housing price bubbles in the two largest Chinese metropolitan areas of Beijing and Shanghai.

The fourth aim of the paper is to elucidate the various kinds of risks faced by major housing market actors. This is done by suggesting a risk taxonomy and by applying it to compare the Chinese and the Swedish housing market from an institutional perspective.

Theoretical framework and methodology

Theoretical considerations of the stock-flow method

Theoretically, general equilibrium is based on the hypothesis that housing markets are efficient. The early stock-flow model presented by Muth (1960) can be used to illuminate
some basic reasons behind the efficiency problems. Muth develops a competitive theory of the housing market to estimate the demand function for housing service and simultaneously relates this demand to investments in new housing and the speed of adjustment to a long run equilibrium. Maisel (1963) uses the model of net flows of construction and depicts the housing market as a typical flow-feedback system. However, a number of studies show that housing markets are not efficient (Hamilton and Schwab, 1985; Linneman, 1986; Case and Shiller, 1989; Gatzlaff and Tirtiroglu, 1995; Man Cho, 1996; Shen and Liu, 2004). By assuming that the market clears gradually rather than quickly, Dipasquale and Wheaton (1994) improve the traditional stock-flow model to be more consistent with the actual situations in housing markets.

As pointed out by Hårsman and Quigley (1991), housing markets are regional or local in character, and the outcome of national policies will depend upon economic and demographic characteristics of the local environment. The regional economy is basically driven by two forces of the demand for outputs and the supply of inputs such as labor, finance and real estate. Clearly, real estate is a primary factor required to produce output. To ensure sustainable economic growth, a region must be capable of expanding its supply of real estate; otherwise real estate prices will rise, causing the increases of labor wages and output costs. Such increases can weaken the competitive strength of a region’s output and eventually slow or even stop its long-run growth.

This thesis examines the dynamics of regional housing markets by adapting the stock-flow method, which allows for supply-side shocks separately from those arising from demand disturbances. To understand better the main driving forces of housing demand and supply, Figure 3 presents a stylized conceptual model describing the operation of a housing market that includes housing stock and new construction.
The diagram indicates that the housing market dynamics is driven by both the demand from households and the supply from developers. Specifically, the dynamic mechanism is driven by the continuous movement of housing expenditures between the two actors of households and developers who are linked through the three markets indicated in the figure: output, fund and resources. The two actors and three markets play different roles in a regional economy. Households consume the output of housing on the demand side, while developers act as the suppliers integrating resources to produce housing. The resources market at the bottom of the figure provides developers with such production inputs as labor and land, whilst households are paid for providing such resources. The fund market in the middle of the diagram shows how savings are diverted to finance investments from households to developers. The output market on the top of the figure handles the housing transactions between homeowners and developers.

The interaction among the actors through the three markets shows how the operation of a housing market may be significantly influenced by exogenous forces like income or wages, interest rates, and the number of households, and by endogenous variables such as housing prices, the stock of housing and input costs. The cash flow across the two sectors
and three markets consists of a whole circular cycle through four main segments representing income, housing expenditures, sales, and resources expenditure, as well as through three additional sections of savings, credits and investment in new construction. Clearly, to keep the sustainable flow of income, housing prices should be affordable for households and that the costs are sufficiently low for developers to produce housing.

*Theoretical considerations of the multi-indicator method*

Dipasquale and Wheaton (1996) formulate a four-quadrant model to analyze the basic factors driving a regional or local housing market, as shown in Figure 4. The figure provides a simple overview of the links between the market for housing consumption and the market for housing investments. From the demand-side, i.e. the upper half of the figure, the rent level, which shapes into the future income stream that housing assets earn, is a key determinant of housing prices. On the other hand, from the supply-side, i.e. the lower half of the figure, construction can influence housing prices and rent by increasing housing stock.

![Figure 4. Four-quadrant analysis framework of a housing market](image)

Note: The arrows refer to the driving direction of determinants.

As the regional economy fluctuates, the housing market also tends to grow or contract.
Interest rates have a direct impact on the demand for housing and new construction will change the stock of housing. Factors like GDP, income and government regulations can be treated as exogenous variable of economy, while housing prices, rents, new construction and the housing stock are endogenous variables.

By analyzing the fundamental driving forces of demand and supply, we can look closer upon the potential indicators of price bubbles. The factors influencing demand may be classified into three categories. First, in the level of economic forces, income is a primary factor. Although each household desires to own a housing unit, it is the income that decides the consumption. Secondly, demographic factors such as the size of the population, the age distribution and the number of households are major factors influencing housing demand. Along with the fast urbanization in China, the number of urban households is growing rapidly and this of course generates a growing demand for housing. The factors covered by the first two categories can be considered as exogenous rather than endogenous. Finally, the third category includes include price, rent and the housing stock, that is variables that have to be treated as endogenous.

The supply of housing is significantly influenced not only by production cost, which includes the level of interest rates in the financial market, the cost of labor, land and building materials in the resource market, but also by the housing stock and price in the output market. As most developers are excessively dependent on the bank loans in urban China, the funding cost is another key factor influencing housing supply. Moreover, during the housing development stage that lasts for about two years, the shift of interest rate level can have considerable impacts on the investment return of developers. The housing price, of course, has an overriding importance. Obviously, high price prompts developers to produce more housing and conversely, low price will decrease the supply of new housing.

To sum up, the equilibrium of a housing market shifts consistently with the dynamic interaction between demand and supply. All else being equal, the increase of income and household numbers will drive the demand for housing, thus raising housing prices, whereas new investment in housing will increase housing stock, thus lowering prices. Therefore, it is reasonable to conclude that the fundamental determinants of a housing market are mainly composed of income and the number of households in the demand side, as well as new construction, the number of developers and input costs in the supply side, whilst the price of existing housing, stock, and interest rates have influence on both housing sides.
Structure and summary of the thesis

Housing price and risk are the two main elements in the thesis. The former is concerned with housing price dynamics and housing price bubbles, and the latter has a close tie with price dynamics and housing bubbles by addressing the issue of risk allocation. Clearly, a study can benefit much from a literature review on what are main topics of research in the Chinese housing market. Therefore, the structure of the thesis can be illustrated in Figure 5.

Figure 5. Structure of the thesis

The thesis is organized as follows. Paper 1 is concerned with an overall review on the existing literature. Paper 2 discusses the regional housing price dynamics in urban China. Paper 3, which has been accepted for publication in the International Journal of Housing Market and Analysis, examines whether there are housing bubbles in Beijing and Shanghai, the two largest metropolises of China. Paper 4 presents how risks are allocated in the different stages on the housing market in Sweden and China. Papers 1-3 are written by Yongzhou Hou, and paper 4 is co-authored with Hans Lind.
This paper reviews a large number of articles about the housing market in China. The literature comes from Chinese core journals in the fields of real estate and relevant economic disciplines. The literature includes a total of over 100 articles published from 2000 to 2008. The articles are of two kinds: one group is written in Chinese and another in English. In particular, the articles produced before 2006, which are written mostly in Chinese, have been published in Chinese core journals and are largely typical of housing research in China. They have been selected from the top two Chinese knowledge databases: CNKI (www.cnki.net) and VIP (www.cqvip.com), the most authoritative ones in the academic field of China. The articles published after 2006 are selected from international English journals and to some extent represents the latest proceedings of housing research on urban China.

The objective of paper 1 is to examine the issues involved in the existing literature mainly in Chinese that are mainly concerned with such six aspects as institutions, policy, land, finance, market and price. The paper is structured with the six topics. The first, dealing with housing institutions, involves the system reform of public housing allocation, economically affordable housing, low rent housing, and housing subsidies. So far, China has completed its transformation from public housing allocation system to market-oriented allocation. However, there is much controversy over the current housing system reform, particularly on economically affordable housing. As pointed out by Quigley (2005) it is difficult to determine the criteria of low-income households and it is more difficult to operate a system for affordable housing considering for example the risks of fraudulence allocation and corruption.

The second group of articles relates to housing policy and describes fiscal and monetary tools like tax or interest rate and their effects on housing prices. Currently, housing sector plays such an important role in the economy that the government is making every effort to prevent the drop of housing prices, while the high price has refrained much demand for housing. The third category of articles mainly deals with the land reserve system and the implications for land policies for the housing market. The fourth considers housing finance issues and it treats subjects such as mortgage loans, risks and housing finance systems.

The fifth group covers the housing demand and supply, housing cycles, and vacancy rates. Land price has been soaring in the last few years and this is a major challenge faced by the government. The rising price of land makes it difficult for developers to buy new land, since they rely heavily on bank loans. This implies that the banking system handles a large fraction of the risks related to housing in urban China, and this is the main reason why the government pays much attention to the stability of housing and financial sector.
In effect, the sustainable development of housing market is dependent upon the steady change of household income and housing supply.

Finally, the articles focused on housing prices explore factors influencing housing prices such as land prices, construction cost and exogenous forces like interest rate and economic policies. Those articles are also concerned with the relationship between housing prices and macro control.

**Paper 2. Regional Housing Dynamics in Urban China**

In an attempt to explain the differences of regional housing markets, *Paper 2* applies an error correction model to the analysis of regional housing markets in urban China. Estimation equations for housing prices are identified and estimated using two stage least squares with cross-section weights. The empirical results suggest that household income is the most significant factor causing housing prices to vary among regions, while user costs, stock and employment have significant impacts as well. It is interesting to note that the estimates for the fundamentals are robust at a national level, implying that there exists a stationary equilibrium relation in the long run between housing prices and fundamentals. The results suggest that income and user cost are the two most significant factors in determining housing prices. The housing stock and size of employment, although less significant than income and user cost, still affect housing prices significantly at a national level and in two of the three major regions (the West is the exception).

Since national level data may cancel out important differences of housing prices between and within regions, the paper investigates the dynamics of housing prices at the regional level as well. Clearly, the results suggest that changes in the underlying fundamentals and the speed of adjustment to price equilibrium vary considerably across regions. The results indicate that it takes around 7 months to adjust to housing equilibrium price in the East, and that the rate of adaptation is slower in the West. The reason is perhaps due to the fact that housing supply is less inelastic in the East than the West. Not only is the urban density quite higher in the East than that in the West, but also more employment tend to migrate towards the more developed East from the West, rather than vise versa. Hence the difference in profit opportunities for developers might be an explanation for the period covered by the analysis.

The paper contributes to a better understanding of the aggregate and regional behavior of housing markets in urban China. Considering the possible statistical errors of data at a regional level, however, it is important to get good quality data to investigate the housing price dynamics across provincial areas. Improved data at the provincial and urban levels
would contribute to a much better understanding of the housing price dynamics in urban China.

_Paper 3. Housing Price Bubbles in Beijing and Shanghai: a Multi-indicator Analysis_

The worldwide financial risks triggered by the U.S. mortgage crisis in 2008 have caused an increasing recognition of the importance of housing because of its inherent relation with capital market and macro economy. The aim of Paper 3 is to examine the possible existence of housing price bubbles in Beijing and Shanghai. To do this, this article makes use of an integrated strategy encompassing both macro economic indicators and micro measures: observed housing market prices are compared with the rational expectation price by considering the development of mortgage loans and the ratios of price to income and to rent. In particular, a control chart, based on GDP per capita, is introduced to quantify the bubble mechanism in metropolitan areas.

From the empirical results, several preliminary conclusions could be drawn. First, the Beijing housing market appears to have been on the way of forming a bubble since 2005, a bubble that gained strength in 2007. The conclusion is strongly supported by the observation that a peak point emerged almost simultaneously in 2005 along the trend line of each indicator: the abnormal deviation of housing market price from the rational expectation price, the expansion of mortgage loans, the sharp growth of housing prices in relation to per capita disposable income, the high price to income ratio and price to rent ratio in 2005.

Secondly, the control chart based on per capita GDP provides an effective way of analyzing housing price bubbles. The control chart of Beijing shows that there might have been three housing bubbles in Beijing since the housing price change exceeded the upper control line in 1993, 1997 and 2007 respectively. As for Shanghai, the control chart indicates a price bubble from 2003 to 2004. Indeed, as a result of Southeast Asia financial crises in 1997, the housing price in Shanghai decreased at 2.6% in 1997 and it went down at 11% in Beijing in the following year. Ten years later, the mortgage crisis started or at least became publicly known in the U.S. Both Beijing and Shanghai may be influenced and if so, the housing markets in both metropolises risk a reversal of current expectations and the possibly a falling housing prices.

Finally, based on the change pattern of housing prices since 1991, the housing market cycle in Beijing could be divided into three stages: the cycle peak stage (1991–1997), the cycle trough stage (1998–2003), and the second cycle peak stage (2004–2008), with average 5 years for each stage. The former two stages had experienced a bubble crash in 1994 and 1998 separately, while it is in the most booming stage from 2005 to 2007. As to
Shanghai, the housing market cycle is not so clear as that in Beijing, except the bubble period from 2003-2004. To sum up, the analysis indicates a bubble in 2007 in Beijing and in 2004 in Shanghai respectively.

**Paper 4. Risk Allocation on the Housing Market: A Comparison between Sweden and China**

The recent global financial crisis points to the importance of the allocation of risks among different housing market actors. The purpose of the paper is to provide a taxonomy for identifying and comparing the allocation of risks typically in China and Sweden during the two different stages: development and ownership. The risk assessments are based on a number of research reports and our direct knowledge concerning the typical situations in Sweden and China.

The main findings are as follows. Some markets might have been much more developed in Sweden than in China. An obvious case is related to insurance markets. Although new construction is covered by an insurance against technical faults and serious quality problems in both countries, the consciousness of insurance appears to be higher in Swedish households. Most households in Sweden also have a “home insurance” that covers some of the costs if there are problems with leaking pipes or accidental damage to a property. Such kind of insurance products are less readily available in China.

The banks and governments appear to take more risks in China, especially as the Chinese developers have a weaker financial situation than in Sweden. This can be related to the higher priority given to housing construction in China. Households have more choices to reduce the risk by purchasing various kinds of insurance products and also by binding the interest rate. The difference can perhaps be attributable to the fact that China is an emerging and developing country while the market has been much developed and mature in Sweden.

**Discussion**

*The trend of relationship between housing prices and the economy*

The ongoing industrialization and urbanization, in parallel with the interrelated economic growth, have successively transformed the urban housing markets in China, a transformation clearly manifested by a steadily and rapidly expanding supply of housing and also by large housing price increases after the policy reforms in 1998. If the transformation is expected to continue in the future, urban population will continue
increasing and the average size of households will probably go on decreasing, both of which will fuel the demand for housing. The increase of disposable income will turn the potential demand into actual purchasing power. In the long run, considering the limited supply of urban land, especially in the developed region, housing prices are expected to increase in large metropolitan areas.

The cyclical characteristic of housing prices

While the housing price has not declined at the national level since 1990s, the growth rate varies in different periods. The variance appears to be closely related with the economic cycle and real interest rate cycle. Housing prices will increase in the boom stage and adjust in the economic contraction. The real interest rate has impacts on both economic growth and housing prices.

When the real interest rate rises, the economic growth may slow down, thus depressing the growth rate of housing prices, but housing prices will go up when the government lowers the real interest rates, as shown in Figure 6. The provincial or local differences, however, might be cancelled out in data for the whole nation.

![Figure 6. Real Interest Rate vs Real Housing Price in urban China](image)

The low level of interest rates appears to encourage the rise of housing prices in the long run. This argument is supported by the fact that the real housing price increased at 111% during the period 1991-2007 while the real interest rate (1 year) decreased at 65% in the same time. However, this is but one interpretation of the correlation indicated in figure 6, since the steady increase of per capita income and the number of households during the
same period might have contributed even more to the price increase.

A challenge for housing research in urban China comes from the availability and quality of data. Since the regional or local differences concerning the transparency of housing market data are far from that of stock markets in China, the conclusion of the thesis possibly meets such potential challenges as data creditability, reliability and comparability. Indeed, however, the data quality of housing in China is improving year by year, especially after entry into WTO in 2001.

**Policy implications**

The findings in the thesis should contribute to a better understanding about the functions of urban housing markets in China and hopefully enlighten housing policies. The study indicates that there exists a relatively stable equilibrium relationship between housing prices and economic fundamentals in urban China. Overall, the economic fundamentals appear to explain the housing prices development in the East, Midland and West over the period 2001-2007, as indicated in Paper 2. However, there exist obvious discrepancy across regions due to different development levels. In other words, there are significant regional heterogeneity between the equilibrium relationship of housing prices and fundamentals. Thus, it is important to consider the discrepancy among regions in determining housing policies.

The equilibrium may be destroyed when housing prices rise dramatically in a short time, for instance, in Beijing and Shanghai as suggested in Paper 3. If such equilibrium is caused by the rapid growth of housing prices, the change of fundamentals such as the income of households or per capita GDP have to increase in a parallel way consistent with the shifts of prices. Otherwise, housing prices may crash without the support from the positive change of fundamentals. Undoubtedly, the slower or stagnant growth of income per capita will have negative impact on the economic development in the long run. This implies that, in such cases, the policies should pay high attention to the steady and parallel increase of household income and employment.

The thesis also demonstrates the need for better data at the provincial and especially the metropolitan level. The prospectively continued economic growth and urbanization may result in serious problems in supplying the land needed for expansion in many metropolitan areas and cities. And better data would undoubtedly enable a better understanding of these problems. The indication of housing price bubbles in Beijing and Shanghai warrants a closer look at the economic incentives driving the behaviour of developers.
References


