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The State of Housing markets in China: Trends, Patterns and Affordability

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The State of Housing markets in China: Trends, Patterns and Affordability

Siqi Zheng, Joyce Yanyun Man, Rongrong Ren

Since housing reform in 1998, the housing market in China has experienced a rapid development. It has dramatically improved the housing conditions of urban residents, whose floor area per capita increases from 19.4 m² in 1999 to 31.6 m² in 2007. However, the considerable increase in housing price and consequently housing affordability problem in a large number of cities have posed enormous challenges for Chinese governments, at both the central and local levels. In order to address policy issues related to housing markets and housing policies in China, this study attempts to analyze the trends, patterns and affordability of housing markets in China since the housing reform.

I. The Trends of China's housing market Development

The development of Chinese housing markets is accompanied by rapid economic growth in China during the period of 1999 and 2007 when the GDP and urban household disposable income both experienced an annual growth rate of about 10 percent on average. The rapid urbanization from about 20 percent in early 1980s to nearly 45% in 2007 is also a driving force of the dramatic growth of housing markets in China's urban areas. In this section, the trends of housing market development with respect to housing supply, housing transaction and housing price are discussed. Due to the data limitation, all our discussions in this section focus upon new residential housing markets instead of housing stock.

Land Markets and Land Supply

The housing market development in China in the past decade is fueled by the drastic increase in land supply by central and subnational governments. The central government is determined to stimulate economic growth by developing real estate market and construction sectors. The Chinese local governments faced a big gap between its expenditure assignment and revenue assignment after 1994 tax reform and turn to collecting land transfer fees for revenue sources to finance public goods and services as mandated by the central government. In anticipation of great profits in the housing sectors, there is a rapidly growing number of companies, both state and privately owned companies, that enter into the real estate markets. In 1999, only about 120 million square meter of land was purchased by Chinese developers, but by 2007 this figure reaches 402 million square meters, a nearly 235 percent increase during this period. As Graph 1 shows, the investment on land development experienced a

double digit growth every year except for 2004 during the period of 2000 to 2007. The increased supply of land leads to the rapid growth of housing supply.

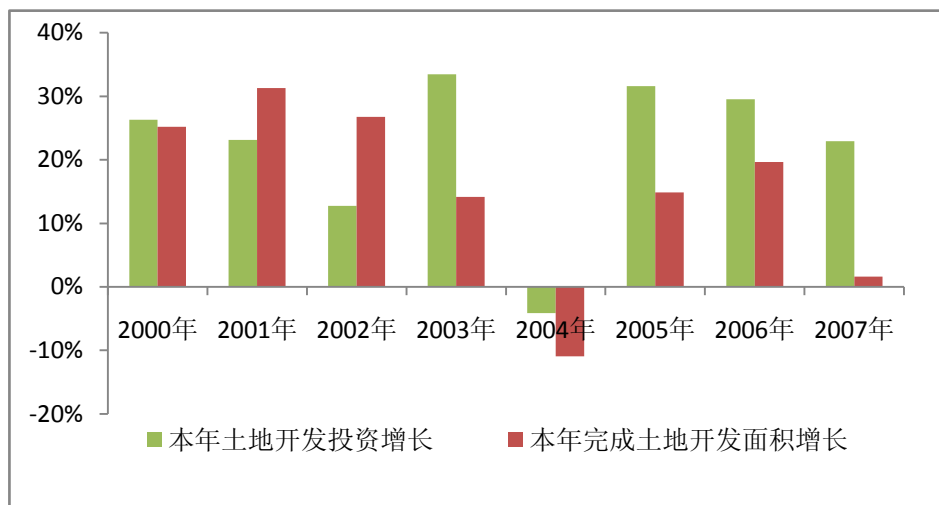


Figure 1 Annual Growth Rate of Investment on Land Development and Completed Developed Areas

Housing Investment and Supply

During the period of 1999 and 2007, the investment on real estate development increased by 21.5 percent annually, on average, while investment on residential housing development increased by 22.9% annually.

It results in the dramatic growth in the floor area of the new construction. For example, in 1999, there was only 188 million square meters of newly built floor areas. Since then it has increased continuously every year and amounted to 788 million square meters, an increase by 320 percent.

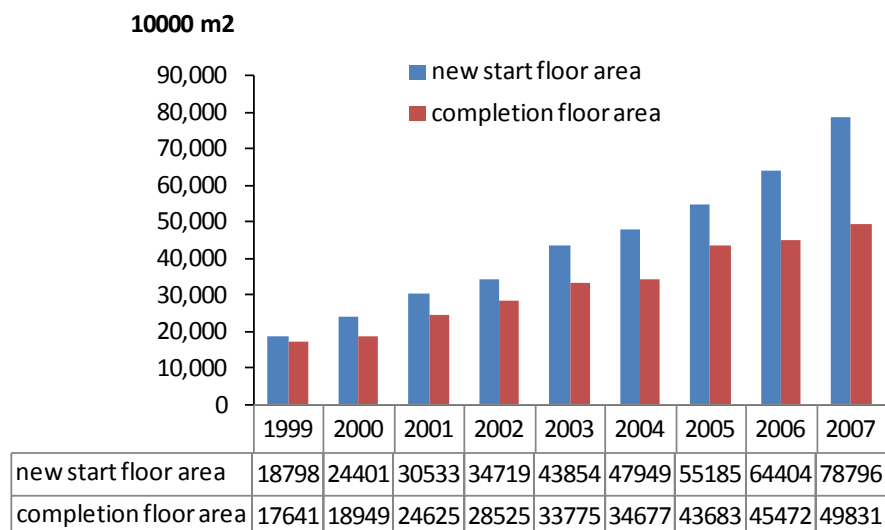


Figure 2. Housing Supply from 1999 to 2007

Data source: China Statistics Yearbook

Housing Sales and Price

The boom in land supply and real estate investment and consequently increase in the floor areas of new construction demonstrate the supply side forces and policies. But the demand for housing is reflected in the housing transactions and the quantity of housing consumptions. As Figure 3 reveals, the total square meters of sold housing space increased from 130 million in 1999 to 701 million in 2007, an increase of 439 percent between the two time periods, indicating a strong demand for housing and rapid development of a real estate market in China.

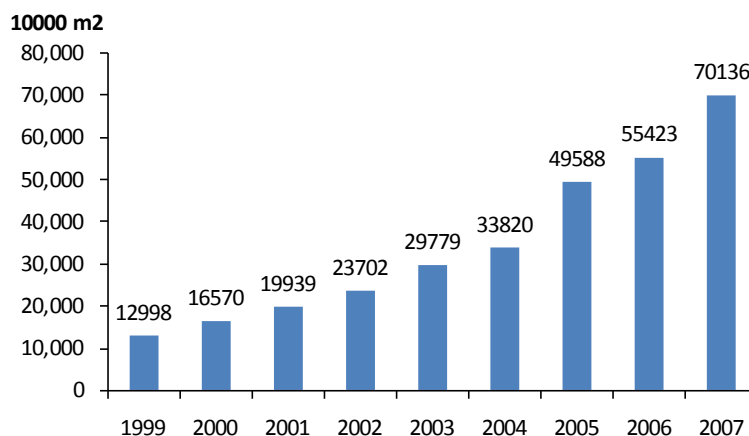


Figure 3. Housing Transactions from 1999 to 2007

Data source: China Statistics Yearbook

Although the total value of housing transactions increased dramatically during the period of 1999 to 2007, the housing price per square meter did not experience a considerable increase between 1999 and 2004. According to Figure 4, the housing price enjoyed a double digit increase starting in 2004, with a growth rate of 18.7 percent. The housing price per square meter is nearly doubled between 1999 and 2007.

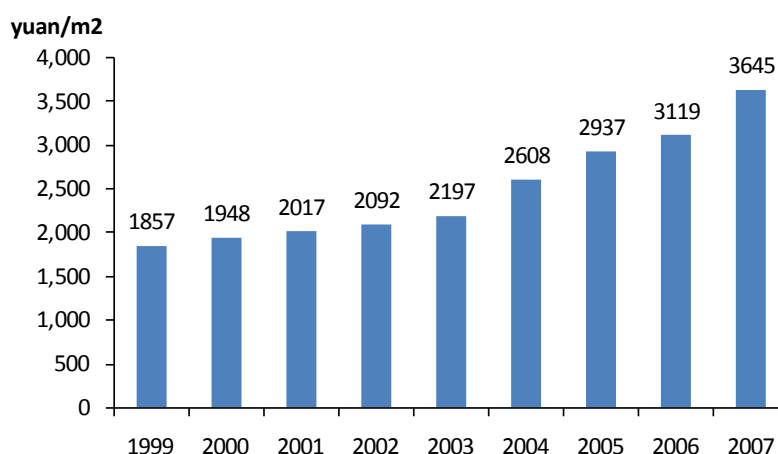


Figure 4. Housing price from 1999 to 2007

Data source: China Statistics Yearbook

II. Patterns of Urban Housing Consumption

In this section, we examine the characteristics of housing consumption, using the data from large-sample Urban Household Survey in 2007 conducted by the National Bureau of Statistic of China (NBS). This survey covers more than 600 cities in China with 520,000 responses to their questionnaires. This data set is unique, because it reveals the conditions of the housing stocks in China instead of the new construction that only accounts for a portion of the total housing stocks. In this study, we focus upon 256 prefecture level cities with 250,000 responses. Various housing consumption characteristics, in terms of dwelling size, property type and tenure structure, owner occupied rate and housing value, are quantitatively analyzed in this section. However, this survey covers only formal housing in the urban areas and the informal housing such as temporary dwellings, villages in a city, and construction site shelters that are often occupied by migrant workers and low-income population are not included.

Homeownership Rate

Homeownership rate is an important measure of the conditions of housing markets in a country. We follow the international standard by defining the homeownership rate as the ratio of owner occupied housing units to total housing units. Based upon the 2007 Large Sample Household Survey data, we found that the owner-occupied homeownership rate reached 82.3% in 2007 in China. As Table 1 shows, this figure varies dramatically across cities. Among 256 prefecture level cities in our sample, the owner occupied home ownership rates range from 34.8% to 97.8%. But a majority of the sample cities (about 69.1%) has an owner occupied home ownership rate exceeding the national level of 82.3%.

Table 1 reveals that the average rate of the owner occupied housing for the four largest municipalities in China is 72.9%, lower than the provincial capital cities (76.9%) and the other prefecture level cities (85.9%). There are lower owner occupied homeownership in the East and Northeast Regions than in the West and Central Regions. It may well be likely that housing cost in big cities and along the east coast affects the owner-occupied ownership rate in the respective areas.

Table 1 Owner-occupied Housing homeownership rate by region

Regions	Owner-occupied rate (%)	Regions	Owner-occupied rate (%)
Municipality	72.9	East area	72.9
Capital cities	76.9	West area	76.9
prefecture-level cities	85.9	Central area	85.9
		North-east area	72.9

It is not surprising that like many other countries, the owner occupied homeownership in China is highly correlated with household income as well. Figure 5 reveals that among the seven income groups defined by Chinese Statistical Bureau, the owner occupied homeownership rate for the lowest income group is 72.9% while the highest income group has 87.4% rate, about 14.5 percentage point higher. The middle income group has a 83.5% owner-occupied home ownership rate, about 1.3

percentage pointer higher than the national average rate. By comparison, American homeownership rates based upon U.S. Census Bureau in 2000 was 66.2%. It suggests that Chinese housing reform started in 1998 has resulted in a higher owner occupied homeownership rate, a sign of positive outcome and great success in promoting homeownership in China.

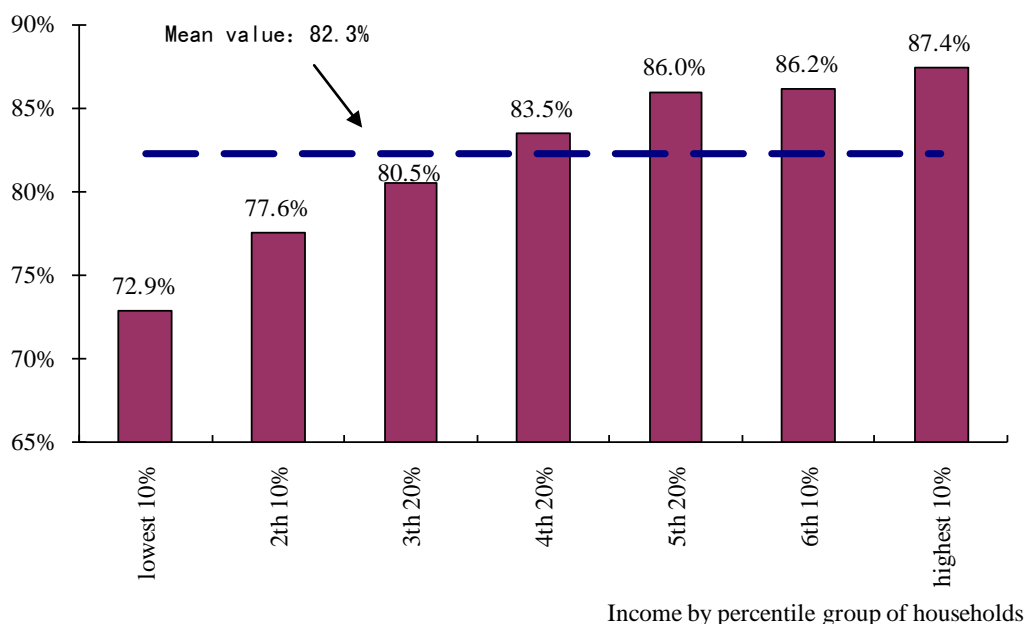


Figure 5 Owner-occupied Housing Ownership Rate by Population Groups

Quantity of Housing Consumption

In addition to the homeownership rate, the quality and quantity of household housing consumption can reflect the conditions of the housing markets. According to the 2007 Large Sample Household Survey, the average construction floor area of a dwelling size is 84.5 m² per household, equivalent to 63.4 square meter of usable living floor area per household. Based upon the average family size of 2.98 person per household in 2007, it can be calculated that average construction floor area and usable floor area per capita is 28.3 square meter and 21.3 square meter, respectively. It is consistent with the figures reported in China Statistical Abstract 2007 that the per capita residential construction floor area of 26.1 and 27.1 square meters in 2005 and 2006, respectively.

Figure 6 shows that the lowest 10% income group occupies 67.8 square meter of construction floor area per household unit, on average, but the highest 10% income group of households consumes about 107.3 m² per unit, on average, indicating a strong correlation between household income and the quantity of housing consumptions.

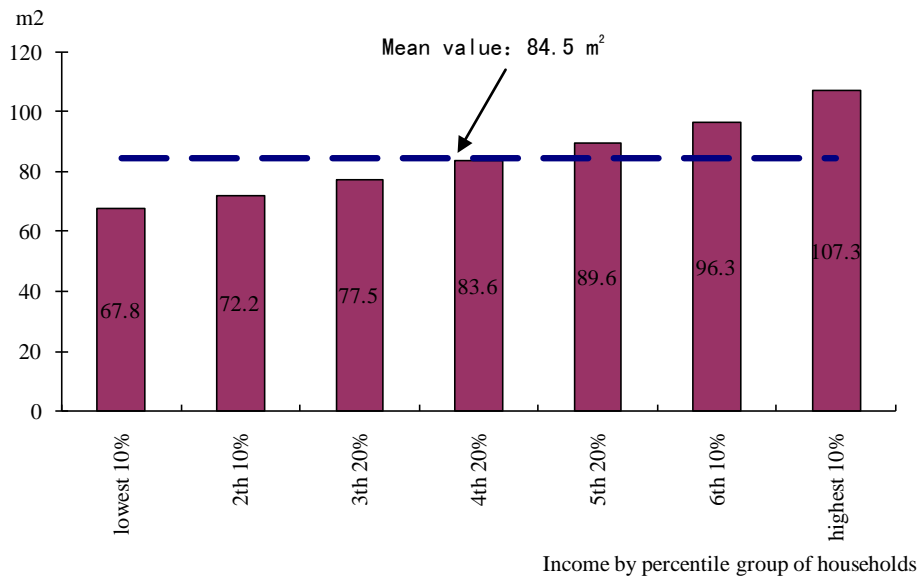


Figure 6 Consumption of Living Areas by Income Group

By International comparison, the housing consumption of the lowest 10 percent income group which has 67.8 square meter construction floor area or 50.9 square meter usable living floor area, exceeds the housing consumption of the low and middle income group in Singapore of an average usable floor space of 45 square meter per household unit. It indicates that there does not exist a problem of overcrowding at the formal housing market in the Chinese urban areas. But it does not reflect the housing consumption and conditions at the informal housing markets for the migrant workers and low-income mobile population.

Housing Tenure Structure

Table 2 reports the property type and tenure structure of the housing stock, according to 2007 Large Sample Housing Survey. The market oriented commercially provided commodity house and rental house accounts for 40.1 percent of total housing stock. The privatized state owned houses is about 34.2 percent of the total housing stock, affordable housing subsidized by government and the state owned public rental housing account for 3.9% and 7.0 percent, indicating an inadequate government support for low-income household in the area of housing consumption.

Table 2 Property type and tenure structure

Marketization	Market oriented housing		Subsidized housing				Others
Tenure structure	Own	Rent	Own			Rent	
Property type	Commercial House	Renting of Private House	Original Private House	Private House Obtained from House Reform	Economically affordable housing	Renting of Publicly-Funded House	
percentile (%)	32.1	8.0	12.0	34.2	3.9	7.0	2.8
Total (%)	40.1		57.1				2.8

Housing Market Value

2007 Large Sample household Survey reports self-estimated housing value of each household. Based upon the data, we calculated that the estimated mean market value of all type of residential housing is 281000 RMB. Calculated by the mean floor area, the estimated value is 3325 RMB per square meter. The housing market value varies by region and jurisdictions. Not surprisingly, the four largest municipalities have an average of 466900 RMB estimated market value, followed by capital cities of 270,500RMB and prefecture-level cities of 201700RMB. But the estimated housing market value for the East Region is more than the twice of that for Central and Northeast Region in China, posing political challenges for assisting the urban poor in the big urban areas and East regions with their basic housing consumption.

Table 3 Housing Value across Regions

Regions	Housing value (1000 Yuan RMB)	Regions	Housing value (1000 Yuan RMB)
Municipality	46.69	East area	30.22
Capital cities	27.05	West area	20.17
prefecture-level cities	20.17	Central area	15.34
		North-east area	13.30

The following table suggests that the higher income group, the higher estimated housing value, demonstrating in the positive income effect on the housing consumption. However, the housing value also varies by property type and housing tenure. The most expensive house is commercial house which has an average price of 400000RMB, followed by affordable housing (304000RMB) and original private house (250000RMB). Public funded rental house has a lowest estimated housing value of 190000RMB.

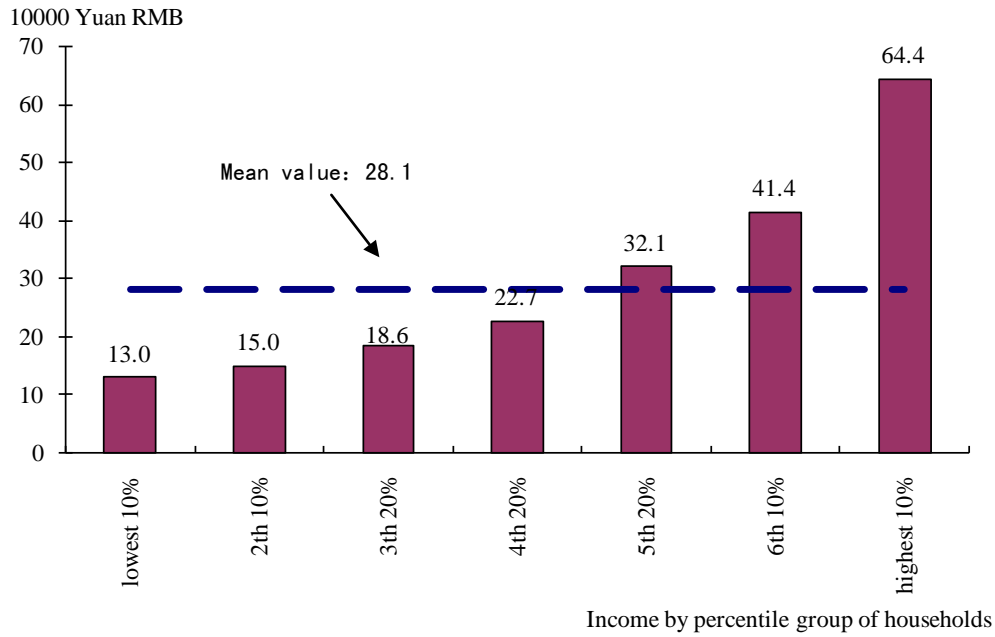


Figure 6 Housing value for different population groups

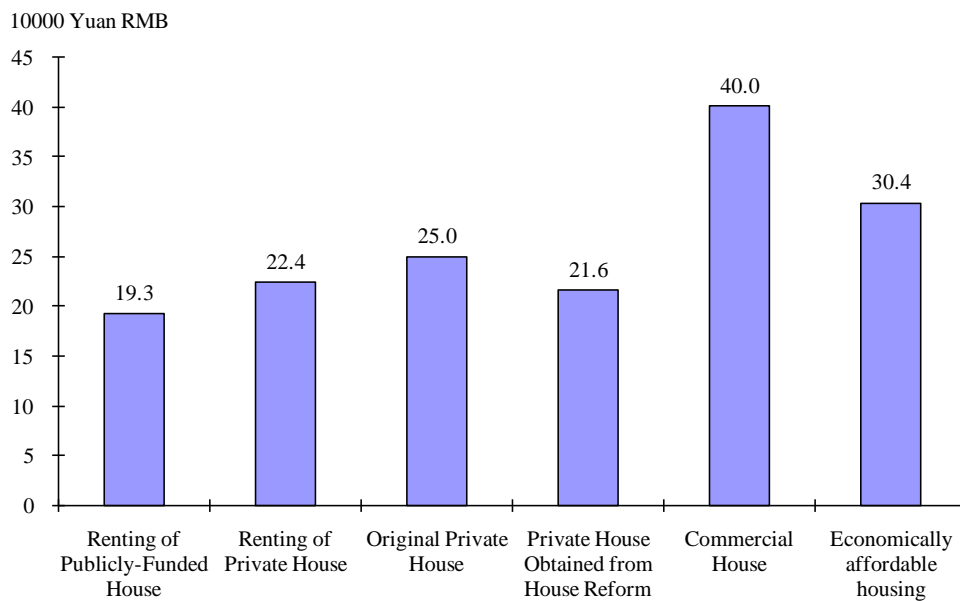


Figure 7 Housing Values by Housing Type

III. Housing Affordability among Chinese cities

In recent few years, most of Chinese cities have experienced rise of housing prices in various degrees, which raises the problem of housing affordability as a major policy concern. Based on the Large-sample Urban Household Survey in 2007 conducted by NBS, we employ the indicators of Housing Price to Income Ratio (PIR) and Housing Affordability Index (HAI) to evaluate housing affordability in 256 prefecture-level cities in China.

Housing Price to Income Ratio

The housing price to income ratio (PIR) is the basic affordability measure for housing in a given area. It is generally the ratio of median house prices to median family income. In the Global Urban Observatory (GUO) of UN-HABITAT, PIR is one of urban indicators^[1]. UN-HABITAT regards ratios of 3 to 5 as “normal” or satisfactory.

Demographia conducts housing affordability survey annually that covers more than 200 markets in Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States. PIR is an important indicator to evaluate housing affordability across cities or countries. Housing affordability is rated as 4 categories based the value of PIR: If PIR is equal to or greater than 5.1, the rating is “Severely Unaffordable”; If PIR ranges from 4.1 to 5.0, the rating is “Seriously Unaffordable”; If PIR ranges from 3.1 to 4.0, the rating is “Moderately Unaffordable”; If PIR is equal to or below 3.0, the rating is “Affordable”.

Table 4 demonstrates the new survey results of Demographic at 3rd quarter of 2008. Among 265 cities surveyed, the highest value of PIR is 9.6, while the lowest one is 1.8. There are 64 cities whose housing affordability market is rated as “Severely Unaffordable”. The PIR for U.S. from the sample of 175 cities surveyed, is 3.2, falling in the category of “affordable” and only 22 percent of the surveyed cities are seriously unaffordable or severely unaffordable.

Table 4 Price Income Ratio (PIR) by selected county from Demographia

Nation	Affordable (≤3.0)	Moderately Unaffordable (3.1~4.0)	Seriously Unaffordable (4.1~5.0)	Severely Unaffordable (≥5.1)	Total cities	Median PIR
Australia	0	0	3	24	27	6.0
Canada	10	15	5	4	34	3.5
Ireland	0	0	2	3	5	5.4
New Zealand	0	0	1	7	8	5.7
United Kingdom	0	0	6	10	16	5.2
United States	77	59	23	16	175	3.2
Total	87	74	40	64	265	

Data source: Demographia (2009)^[2].

Table 5 PIR in China

Median House price	Mean Housing price	Median Family income	Mean Family income	Median PIR	Mean PIR
180,000 RMB	280,000 RMB	32,400 RMB	43,350 RMB	5.56	6.46

Data on China is calculated by authors using data from 2007 Large Sample Household Survey of all the cities in China

Based on the Large-sample Urban Household Survey in 2007 conducted by

NBS, we calculate PIR for China as a whole and for each of 256 prefecture-level cities in China as shown in Table 7 and Table 8. The results indicate that the median price income ratio (PIR) in China in 2007 is 5.56, and the mean PIR for all the cities in China is 6.46. Both the figures go beyond the “normal” or satisfactory level defined by UN-HABITAT. They fall in the category of “Severely Unaffordable”.

By studying the price-income ratio for 265 prefecture cities, we find that the median PIR is 5.21 and the average PIR for the sample cities is 5.54. As Table 6 shows, among 256 prefecture-level cities, only 10 percent of the cities are affordable with PIR below 3.0. Nearly 52 percent of all the prefecture-level cities in China are suffering from “Severely unaffordable” problem, and about 21 percent of the cities are “seriously unaffordable”. In comparison with U.S., according to Demographia (2009), only 9 percent of 175 American cities had the rating of “Severely Unaffordable” and 13 percent of surveyed cities is “Seriously unaffordable”, but ABOUT 44 percent of cities are “Affordable”.

Table 6 PIR for 256 prefecture cities in China

Nation	Affordable (≤ 3.0)	Moderately Unaffordable (3.1~4.0)	Seriously Unaffordable (4.1~5.0)	Severely Unaffordable (≥ 5.1)	Total cities	Median PIR
China	26 (10.2%)	43 (16.8%)	54(21.1%)	133(51.9%)	256	5.21

Housing Affordability Index

Housing affordability index (HAI) is published monthly by the National Association of Realtors (NAR) since 1981. The HAI assumes borrowers make a 20 percent down payment and that the maximum mortgage payment is 25 percent of gross monthly income for the household. The HAI index has a value of 100 when the median-income family has sufficient income to purchase a median-priced existing home. A higher index number indicates that more households are affordable to purchase a home.

According to the statistics of NAR, HAI in US from 2006 to 2008 is respectively 106.1, 111.8 and 128.6^[3]. Figure 8 demonstrates the variation of HAI in Australia^[4]. The number of HAI decreases from 135.1 at 1th quarter 2005 to 103.1 at 1th quarter 2008, which means the housing becomes more unaffordable to households. At 1th quarter 2008, the HAI value in several capital cities is lower than 100, such as Sydney (94.3), Brisbane (81.6) and Pace (90.7).

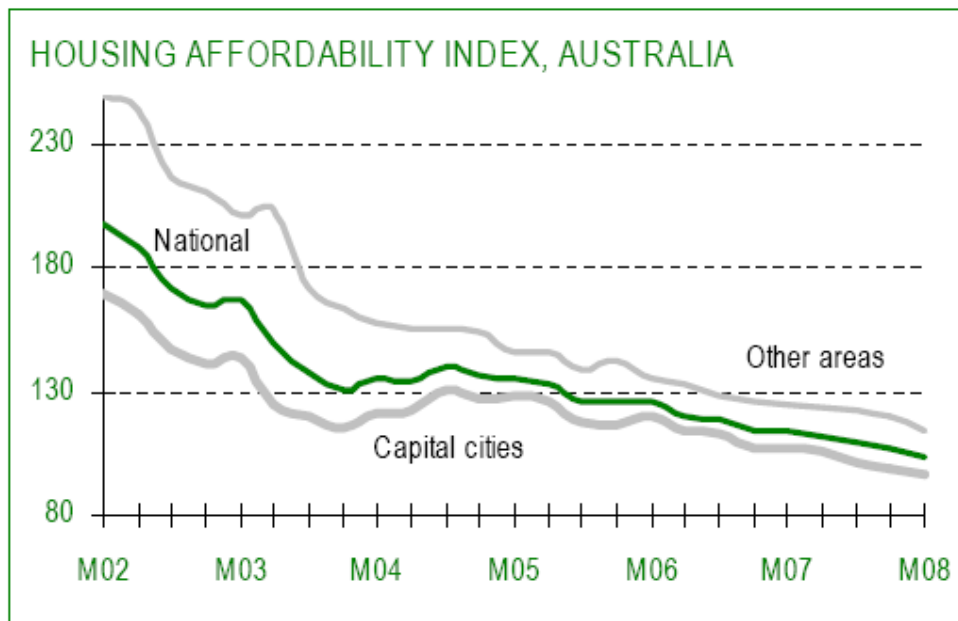


Figure 8 HAI in Australia

Based on the Large-sample Urban Household Survey in 2007 conducted by NBS, we calculate HAI in 256 prefecture-level cities in China. The parameters used in the formula of HAI are set as follows: the down payment is 30%, the maximum mortgage payment is 25 percent of gross monthly income for the household, the lending rate is 6.84%, and the length of maturity is 30 years. Therefore, HAI in 256 prefecture-level cities in 2007 is demonstrated in Table 7.

The value of HAI in China is 81.8 in 2007, which is lower than 100, indicating severe unaffordability for the households living in the prefecture-level cities, on average. Only 94 cities in 256 prefecture-level cities have HAI values more than 100. About 63.3 percent of the prefecture-level cities have a housing affordable index (HAI) below 100, indicating the households in those cities with median income does not have sufficient income to purchase a median-price existing house in the city of their residence.

Table 7 Variation of HAI across Regions

Criteria for classifying	Regions	Number of cities	Mean HAI	Median HAI
Whether belongs to capital cities	Capital cities and Municipality	31	77.0	75.8
	Other cities	225	97.5	90.9
Whether belongs to 35 large cities	35 large cities	35	69.9	72.8
	Other cities	221	99.0	90.9
Geographic position	Eastern cities	98	79.0	68.3
	Central cities	96	106.4	99.3
	Western cities	62	102.8	97.2

Table 7 reveals that the Housing Affordable Index is lowest in the prefecture-level

cities in the Eastern Region. The 35 largest cities in China have a median HAI of 72.8 but the other cities have a HAI of 90.9, about 18 points lower, indicating that housing affordability issue exists in 35 largest cities and East Coast Region. The housing reform may have made households of large cities less affordable for housing consumptions.

IV. Major Findings

This paper attempts to study the trends, patterns and affordability of Chinese housing market since the launch of housing reform in 1998. The data from statistical abstracts, Ministry of Finance, and 2007 Large Sample Household Survey are collected and analyzed. There are the following major findings:

1. During the period of 1999 to 2007, there is a significant increase in land supply, up by 235 percent. The investment on land development experiences a double digit growth every year except for 2004. The increased supply of land leads to the rapid growth of housing supply.
2. During the period of 1999 and 2007, the investment on real estate development increased by 21.5 percent annually, on average, while investment on residential housing development increased by 22.9% annually. As a result, the square meters of newly built floor areas experienced a rapid increase and amounted to 788 million square meters, up by 320 percent between 1999 and 2007. It suggests that the Chinese government's housing policy has encouraged the investment on the real estate industry in an attempt to increase housing supply.
3. Due to the urbanization and rapid increase in disposable income, the sales of total square meters of housing space increased from 130 million in 1999 to 701 million in 2007, an increase of 439 percent between the two periods. As a result, the housing price also increased considerably, especially since the year of 2004. The price of housing per square meter has nearly doubled between 1999 and 2007. It demonstrates a steady and strong demand for housing and rapid development of a real estate market in China.
4. Based upon the 2007 Large Sample Household Survey, data, we found that the homeownership rate in China reached 82.3% in 2007. However, there is a considerable variation by city. Among 256 prefecture level cities in our sample, the owner occupied home ownership rates range from 34.8% to 97.8%. A majority of the sample cities (about 69.1%) has an owner occupied home ownership rate exceeding the national level of 82.3%. Chinese homeownership rate exceeds many developed countries including U.S. (about 67%).
5. After analyzing data from the 2007 Large Sample Household Survey, we found that the average construction floor area of a dwelling size is 84.5 m² per household, equivalent to 63.4 square meter of usable living floor area per household. By calculation, average construction floor area and usable floor living area per capita is 28.3 square meters and 21.3 square meters, respectively. The

total Constructed floor areas range from 67.8 square meters per household for the lowest 10% income group to 107.3 square meters for the highest 10% income group. By comparison with Singapore, there does not indicate an over-crowdness of living spaces for an average household.

6. The market oriented commercially provided commodity house and rental house accounts for 40.1 percent of total housing stock. The privatized state owned houses is about 34.2 percent of the total housing stock, but the affordable housing subsidized by government and the state owned public rental housing account for 3.9% and 7.0 percent, respectively, indicating an inadequate government support for low-income household in the area of housing consumption.
7. The estimated average market value of all type of residential housing stock is 281,000 RMB in China, about 3325 RMB per square meter in 2007. It is apparent that the four largest municipalities in China have an average of 466,900 RMB estimated market value, followed by capital cities of 270,500RMB and prefecture-level cities of 201,700RMB. The estimated housing market value for the East Region is more than the twice of that for Central and Northeast Region in China, indicating that residents in big cities and the East Coast Regions enjoyed a rapid accumulation of asset values in China.
8. The median price income ratio (PIR) for China as a nation is 5.56, and the mean PIR for all the cities in China is 6.46, putting China in a category of “Severely Unaffordable” according to the definition of UN-HABITAT. The median price-income ratio for 265 prefecture cities is 5.21. Only 10 percent of the cities are affordable and nearly 52 percent of all the prefecture-level cities in China are suffering from “Severely unaffordable” problem, and about 21 percent of the cities are “seriously unaffordable”. By comparison, only 9 percent of 175 American cities had the rating of “Severely Unaffordable” and 13 percent of surveyed cities is ranked as “Seriously unaffordable”. More than 44 percent of American cities in the sample are rated “Affordable”. It suggests that the housing affordability has become a big problem for Chinese homebuyers, even though it is calculated using the housing stock data. If the newly constructed housing data is used, the housing affordability problem can be much more severe.
9. By using international standard calculation of House Affordable Index (HAI), we found that the value of HAI in China is 81.8 in 2007, indicating severe unaffordability for the households living in the prefecture-level cities, on average. About 63.3 percent of the prefecture-level cities have a housing affordable index (HAI) below 100, indicating the households in those cities with median income do not have sufficient income to purchase a median-price existing house in the city of their residence. The bigger the cities are in terms of population size, the lower the value of Housing Affordable Index.
10. This study demonstrates that the housing reform in 1998 has resulted in large increase in land supply, housing supply as well as housing consumptions. But the side effects of this housing sector privatization have caused inequality among income groups and regions. The low-income group has been left out of this historical reform and become losers. The housing stock has become severely

unaffordable in China, posing risks and challenges that may threaten the sustainability of economic growth and the stability of the society. It is certainly contrary to the goal of becoming a harmonious society for China. It shall be the focus for Chinese government in their design for a sound housing policy in China.

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