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# Chinese urbanization and urban housing growth since the mid-1990s

Junhua Chen · Fei Guo · Ying Wu

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**Abstract** This paper presents a comprehensive analysis on the situation of urbanization and urban housing growth since the mid 1990s in China. It calculates a much improved measurement of urbanization level in each province, which takes the unique characteristics of China's urban/rural composition into consideration. Relative to the CPI (Customer Price Index) deflator, the adjusted prices of urban commodity house in each province between 1995 and 2005 are computed in this article. The correlation analysis on urban commodity prices and the levels of urbanization in each province gives evidence to support the regional variation of urbanization and urban housing growth in China. The results suggest that the existing high urbanization levels but still boosting urban commodity housing prices in developed provinces make the serious challenge to local urban housing provision. In contrast, the moderately developed provinces benefit from the relatively even expansion of both urbanization and urban commodity housing prices.

**Keywords** Urban housing · Urbanization · Migration · China

## 1 Introduction

Since the mid-1990s, China's new round of market-oriented economic reforms has driven the processes of population migration and urbanization at an extraordinary pace, mainly through massive rural-to-urban migration and the development of new urban centers (Wang and Murie 1996; Ma 2002). In the meantime, China has also undergone an evolutionary process of urban housing commercialization (Wu 1996). Facing simultaneously rapid urbanization and an urban housing transition, many scholars have expressed their worries about the urban problems caused by speedy urbanization (Yang 1993; Kojima 1995; Yeung and Shen 2004). Among these problems, an urgent issue is how to

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accommodate the increasing number of new residents in urban areas. As the literature on many other countries suggests, the process of urbanization, mainly depicted as a migration of population from rural areas to cities, often has a stimulating effect on urban housing markets (Kottis 1971). At the same time, it also causes many social problems in urban areas (Qadeer 1974; Preston 1979). The explanations of urbanization and rural–urban migration that have been advanced in the literature, whether based on the ‘pull’ hypothesis or the ‘push’ theory, illustrate an evident phenomenon. They portray a blind and excessive rural-to-urban migration as the source of urban sprawl, slums, the shortage of lodging, and housing segregation (Pearson 1963). “Global Demographics 2008: Shaping Real Estate’s Future”,<sup>1</sup> a report released by the Urban Land Institute, provides a snapshot of the challenges to the real estate industry in the next 20 years. The industry will have to face up to worldwide urbanization and migration, especially in emerging markets.

China has experienced not only rapid urbanization but also an evolutionary transition from a welfare housing system to market-oriented urban housing provision in only two decades (Chen et al. 2010). We are interested in the attractive hypothesis that China, the most energetic developing country in recent history, will repeat the story of urbanization and urban housing growth that has played out in many other late-developed countries. Since the mid-1990s, the latest round of reform in the Chinese bureaucratic housing system has aimed to encourage the privatization of urban housing and homeownership. The more flexible *Hukou*<sup>2</sup> system (household registration system) adopted by the Chinese government has also encouraged more surplus rural labor to migrate to urban areas. Rural residents without an urban *Hukou* have been permitted to migrate to towns and cities. However, they could not gain access to the same welfare provisions that urban residents are eligible for. Some large cities offer temporary residential permits such as the ‘blue stamp’ *Hukou* (*Lanyin Hukou*) introduced in Shanghai. These changes strengthen the hypothesis that a reciprocal relationship between urbanization and urban housing provision may appear in China, just as it has in many developing countries (Zax 1997; Shen 2000).

Other authors trying to answer the above questions have mainly approached the subject by reviewing macro-aspects of China’s housing system, particularly housing policies (Wang and Murie 1996, 1999) and housing consumption (Li 2003; Li and Zheng 2007). However, regional variations in urbanization and urban housing markets remain under-exposed; many studies treat China’s urbanization and urban housing growth as a whole. The lack of provincial data and suitable evaluation methods is the main reason for this gap. Based on data from the Chinese Statistical Yearbooks published by NBSC (National Bureau of Statistics of China), this article explores the contemporary situation of urbanization and urban housing growth in urban China since the mid-1990s. It calculates urbanization rates and urban commodity housing prices for each province between 1995

<sup>1</sup> This report can be obtained from The Urban Land Institute (<http://www.uli.org>).

<sup>2</sup> Chinese Household Registration System was promulgated by 1958 *Hukou* regulation (*Hukou dengji tiaoli*). The Household Registration or *Hukou* is an identification system in which every citizen is registered at the place of his/her birth, the place to which he or she is permitted to move, or his or her mother’s place of registration. In the pre-reform era, one’s *Hukou* status was often associated with various subsidies or other benefits provided by the government. It divides Chinese citizens into two major categories: agricultural and non-agricultural residents. People with non-agricultural *Hukou* status often enjoyed more benefits than those with agricultural status, e.g. non-agricultural residents in cities could enjoy free or cheap housing, medical services, education, and employment opportunities, while their counterparts with agricultural *Hukou* status would not normally be entitled. See Guo and Iredale (2004), Cheng and Selden (1994), and Yang (1993) for a detailed discussion.

and 2005. Then it discusses the empirical correlation between China's urbanization levels and urban housing growth.

The remainder of this article is organized as follows. The next section gives a brief review of China's urbanization process and urban housing growth. The third section introduces an improved method to calculate the annual urbanization rate for each province. The data on urban commodity housing prices between 1995 and 2005 is presented in the fourth section to reflect urban housing development. In addition, GIS is used to depict the spatial distribution of urbanization levels and urban commodity house prices in these two sections. The fifth section concerns the empirical relationship between urbanization levels and urban commodity house prices in China. In the discussion section, the implications of the findings are placed in the context of China's urbanization and housing scene.

## 2 Urbanization and urban housing growth

The urbanization pattern in many developing countries is often described as distorted, characterized by high fertility rates, over-urbanization, poverty, and extreme urban primacy (Bairoch 1982). In the view of Bradshaw and Fraser, however, China does not suffer from over-urbanization and structural imbalance. To some extent, urbanization (especially on a large scale) is a positive feature (Bradshaw and Fraser 1989, p. 988). The main reason is the strict regulation of intra-country migration (Kojima 1995). For a long time, China followed the Russian model of economic growth. This produced a form of urbanization similar to that of FSU (the Former Soviet Union) and ECE (East and Central European) countries, which emphasized a low level of urbanization and the 'anti-urban bias of Chinese ruling ideology' (Ma 2002: p. 1548). In 1949, only 10.6% of China's population was living in urban places, yet their number (57.6 million people) was more than the total population of all but 11 countries in the world as recently as 1983 (Song and Timberlake 1996, p. 290). After 33 years, according to the 1982 census, China's urbanization level had doubled (compared to the percentage of 1949) to 20.8%, and there were 211.3 million people living in its urban areas. By that time, the size of China's urban population was only exceeded by the total population of just three countries (the USA, USSR, and India) and was still well below the relative level in developing countries as a whole (Goldstein 1988). Some scholars have characterized this period of low urbanization before the 1990s as one of 'under-urbanization' or 'industrialization with controlled urbanization' (Murray and Szelenyi 1984; Ma and Cui 1987; Lin 1998).

China embarked on two important changes after 1990. The first was the sharp increase in rural-urban migration to major urban centers and new small towns. In the 1990s more than 100 million peasants left the farms seeking employment in the cities each year (Wang 2000). The total net migration in the 1990s is almost equal to the sum of the previous four decades. Since the mid-1990s, China has instituted the latest round of reforms to the *Hukou* system, which has divided Chinese citizens into two classes over the past five decades. After 1990, some large cities introduced a temporary residential permit, such as the 'blue stamp' *Hukou* in Shanghai. Once a person obtains a temporary residential permit, he/she can enjoy the privilege of residence and certain urban welfare amenities. Some media in the West even reported that the *Hukou* was about to be abolished (Rosenthal 2001). This official loosening of the urban household registration system (*Hukou*) to some extent facilitated rural-urban migration after 1990. In many provinces, the urban population growth rates had risen far beyond the urban population fertility rates. This means that the

natural population growth in urban areas cannot lead to such a fast increase in the urban population without rapid growth in the number of rural migrants.

Compared to the urbanization process, China's urban housing growth went through a more complicated transition due to the sensitive issue of land ownership in this socialist country. Before the Reform and Opening-up Policy of 1978, there was no urban housing market, and urban housing provision was part of the socialist welfare system. Even after economic reforms were instituted in 1978, the commercialization of urban welfare-oriented housing still progressed slowly, mainly owing to the long-running debate on state-owned land and the cession of welfare housing distributed by work units (*Danwei*). At that time legal recognition of private homeownership was a great challenge to the government, given its socialist context. Throughout the 1990s, the reform of the urban housing system experienced several critical turning points. In 1992, the government established a housing reform office in almost every city, making it responsible for the cession of state-owned and *Danwei*-owned houses and the mandatory urban Housing Provident Fund (HPF).<sup>3</sup> After 1995, China introduced market mechanisms and established an urban housing market. The welfare housing distribution within state-owned enterprises and government ministries was abolished through the transition from welfare housing to private property.<sup>4</sup> Before this transition, 80% to 90% of housing investment came from government or state-owned enterprises. That percentage decreased to less than 50% after 1995. In 2001, around 80% of homes in urban China were privately owned (People's Bank of China, 2002). The revolutionary transition from state-sponsored welfare housing allocation to market-oriented homeownership was completed in only about 10 years.

Recently, the urban housing market has become the principal track for most Chinese urban residents and migrants seeking to obtain a dwelling for their family (Chen et al. 2010). Rural–urban migrants without an urban *Hukou* do not qualify for state-sponsored UAH (Urban Affordable Housing), which is far cheaper than the normal price in the local housing market. In addition, the limited supply of UAH and the strict application requirements force most urban residents to fulfill their housing dreams on the urban commodity housing market. Theoretically, China's rapidly increasing urban population (including a mass of temporary population without a local urban *Hukou*) would have led to a thriving demand for housing. A hypothesis could be advanced that the rapid urbanization and incredible rural–urban migration since the 1990s have produced a large demand for houses and facilitated the urban housing growth. Before exploring the relationship between China's urbanization process and urban housing growth during the period from 1995 to 2005, we must consider the challenge of the detailed measurement of urbanization levels and urban commodity housing prices at the provincial level. Using data from the Chinese Statistical Yearbooks published by NBSC, the following two sections attempt to resolve this difficulty.

<sup>3</sup> China's compulsory Housing Provident Fund (HPF) was initially introduced as a pilot program in Shanghai in late 1991, and was extended nationwide in 1995. HPF is similar to housing fund programs in other countries, such as Singapore and the United States. HPF provides citizens with an account that combines saving and retirement functions with subsidized mortgage rates and housing price discounts. See Buttner et al. (2004) and Burrell (2006) for a detailed discussion.

<sup>4</sup> The welfare housing is known as *Danwei* housing. *Danwei* housing is usually built by public-sector work units (*Danwei*) and distributed for free or sold to employees at a very low price according to the working time of these employees (Gongling) or the rank of their official position (Xingzheng Jibie).

### 3 Provincial urbanization levels since the mid-1990s

The most common methodology to calculate urbanization level is the UN (United Nations) Method. It was designed for this purpose by the United Nations Population Division and uses incomplete data to estimate the urban–rural population rate, namely, the level of urbanization. This method is commonly applied in developing countries, where complete figures on the annual urban–rural population rate are rare. Detailed information on the United Nations Method can be found in No. 55 Population Studies, published by the UN Department of Economic and Social Affairs.

This article uses an adjusted method to amend the urbanization levels calculated by the UN Method. Zhou and Ma (2003) found that China has annual agricultural and non-agricultural population data which is based on the *Hukou* system. Compared with urban and rural population data, agricultural and non-agricultural population data would not cover temporary migrants living in urban areas. Nonetheless, it has advantages such as availability and consistent definitions, and it is not distorted by changes in the definition of urban areas. This paper takes the unique characteristics of China’s urban and rural composition into consideration. It also evaluates the longitudinal measurements of urbanization level in each province that were made between 1995 and 2005. The detailed steps of this method are presented in endnote 5.<sup>5</sup> Using annual non-agricultural rates published between 1995 and 2005, the deviation coefficient “*r*”<sup>6</sup> is used to adjust the interpolated urban–rural rate in each province. In this way, adjusted urbanization levels in each province were determined for 1995–2005. In view of the uneven regional development, all provinces have been aggregated and then divided into three large regions (coastal, central, and western China) to illustrate the variation in urbanization. The results suggest that China’s urbanization process is not uniform but unbalanced, in light of the high urbanization levels in developed provinces in the coastal region. However, most provinces have experienced a relatively slow increase in urbanization level. Those situated in the central region experienced a rapid growth in urbanization from 1995 to 2005. Provinces located in the western part had both the lowest urbanization levels and the slowest development of urbanization between 1995 and 2005.

To illustrate the regional variation in urbanization, the Comparable Urbanization Growth Rate (CUGR) was measured in each province. We calculated the proportion of the provincial urbanization growth and the national average increase in urbanization level between 1995 and 2005. The results were mapped out with the help of Mapinfo, as shown in Fig. 1. It appears that in some developed provinces in coastal China—such as Beijing, Shanghai, and Tianjin—the pace of urbanization was not very fast from 1995 to 2005, mainly owing to existing high urbanization levels. In contrast, many moderately developed

<sup>5</sup> The UGRD in this article is defined as the Urbanization Growth Rate Difference between 1995 and 2005:

$$UGRD_{1995-2005} = \frac{\ln \left( \frac{PU_{2005}}{1-PU_{2005}} / \frac{PU_{1995}}{1-PU_{1995}} \right)}{n}$$

where  $PU_{1995}$  and  $PU_{2005}$  are the urban population percentage of the national 1% population sample survey in 1995 and 2005;  $n$  is the number of years between 1995 and 2005. This index is based on the United Nations Method, which is widely used to forecast levels of urbanization. See United Nations, “Manual VIII: Methods for Projections of Urban and Rural Population No. 55,” Department of Economic and Social Affairs, Population Studies New York, United Nations, 1974. This index is also used in the studies by Zhou and Ma (2003) and Chan and Hu (2003).

<sup>6</sup> The deviation coefficient “*r*” is the ratio of the published annual non-agricultural rate to the estimated annual non-agricultural rate calculated by the United Nations extrapolation method. As for the United Nations method, see endnote 5 for the reference.

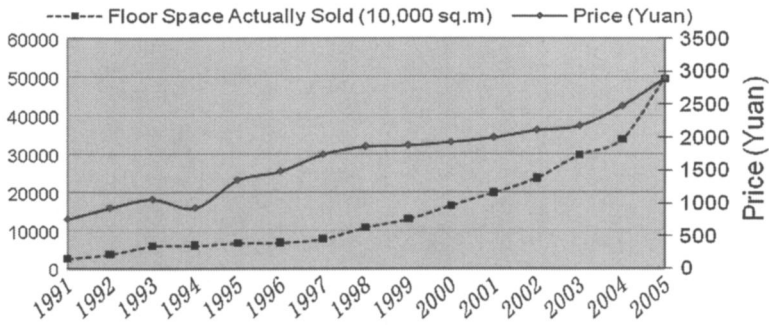


**Fig. 1** Spatial distribution of comparable urbanization speed from 1995 to 2005. Chongqing was not separated from Sichuan province until 1997, when it became a Centrally Administered City

provinces—such as Fujian, Henan, Anhui, Jiangxi, and Henan—also experienced rapid growth in this period, though their urbanization rates remained relatively low. Urbanization levels in many late-developed provinces increased slowly during this period. For example, while Shanghai had a fairly slow increase in urbanization level, rising only by 6.4% from 1995 to 2005, it had the highest urbanization rate in the country, with more than 89% of the population living in the urban area. In addition, the urbanization levels in many late-developed provinces continued to rise gradually during this period, though they were still quite low. For example, the urbanization rate of Guizhou province grew from 22.68% in 1995 to 26.87% in 2005, an increase of only 19%. The empirical results discussed above show that China's urbanization process distinguishes itself as a form of uneven regional development with a huge gap in urbanization level.

#### 4 Urban housing growth since the mid-1990s

Unlike the urbanization level, there is no authoritative method to measure urban housing growth. In many countries, housing price is the common indicator of the situation in the urban housing market (Hallett 1993). However, NBSC did not publish quarterly data on housing prices until 2002. Moreover, due to the missing values for annual urban housing prices in some late-developed provinces of China, it is hard to investigate urban housing growth at the provincial level. This study adopts the data of Floor Space of actually Sold Commodity Houses (FSSCH) and the Sales Value of Commodity Houses (SVCH) from NBSC to calculate the urban commodity housing price in each province. FSSCH is a comprehensive indicator of urban commodity housing consumption (floor space actually sold). Moreover, FSSCH reflects the situation of homeownership sold in the urban housing market, which is different from the collective ownership regulated by the welfare-oriented housing provision before 1998. Using the data of FSSCH and SVCH, this study evaluates the urban commodity housing price in each province of China by comparing SVCH to



**Fig. 2** Urban floor space of actually sold commercial residential housing and CPI deflator-adjusted commodity housing price in China: 1991–2005. *Source* National Bureau of Statistics of China



**Fig. 3** Spatial distribution of commodity house price in 1995 (Yuan/sq m)

FSSCH. In light of the CPI (Consumer Price Index), Fig. 2 depicts the structure of commodity housing prices at the national level during the period from 1995 to 2005.

The results suggest that both housing transaction volume and housing price in each province of China increased rapidly from 1995 to 2005. For example, relative to the CPI deflator, the adjusted price of urban commodity housing at the national level in 2005 is more than six times higher than that of 1991. Particularly, the official end to the provision of welfare housing in 1998 offered an institutional impetus for the rapid increase in not only urban housing transaction volume but also the urban housing price. From then onwards, the urban housing market becomes the major, sometimes even the sole, source of housing provision, leading to the appreciation in house prices.

In order to reflect the growth of commodity housing price in each province, Mapinfo was used to map out the spatial distribution of commodity housing prices in three critical years: 1995 (Fig. 3), 2000 (Fig. 4), and 2005 (Fig. 5). The first year in which a dual





**Fig. 4** Spatial distribution of commodity house price in 2000 (Yuan/sq m)



**Fig. 5** Spatial distribution of commodity house price in 2005 (Yuan/sq m)

housing provision system was established in urban China was 1995. It comprised a social housing sector of ‘economical and comfortable housing’ for low- and middle-income urban local households and a commodity housing sector targeting the higher-income group (Li and Huang 2006). However, it should be mentioned that ‘economical and comfortable housing’ plays only a small part in the dual system. Moreover, the

qualification standards for 'economical and comfortable housing' set by the municipality are so loose that many upper-middle-income households are also eligible for it. In many cases, applicants with privilege or multiple sources of income may not be strictly monitored due to backdoor deals (Tomba 2004; Wang 2001). In addition, 2000 is regarded as the year when partial homeownership was terminated in urban areas; the urban secondary housing market was opened to the owners of 'reform housing' under resale restrictions in 2001 (Li and Zheng 2007). Since then, 'economical and comfortable housing', a former category of public housing, can be resold as a special type of commodity house in an urban housing market after the restricted trade period (normally 5 years). In China's large cities, where commercial housing is much too expensive for ordinary households, affordable 'economical and comfortable housing' is popular. Although the opening up of 'economical and comfortable housing' to sales has been affected by a temporary dip in house prices in large cities, it seems that this type of housing is gradually losing its original function as a form of public housing. Urban house prices began to skyrocket in 2005, and growth has remained in the double digits ever since July 2005, when China started to cover more cities in its monthly housing price survey. In 2005, the housing structure entered an era of complete homeownership and has become a major concern of Chinese citizens and governments.

Figure 3 illustrates the regional variation of urban commodity housing in 1995. Those provinces located in the coastal region (Guangdong, Jiangsu, Zhejiang, Hainan, and others) and the centrally administered cities (Beijing, Shanghai, and Tianjin) had higher commodity housing prices in 1995, compared to other provinces. A possible reason is that China's earliest round of urban housing reform was first instituted in these developed provinces. In contrast, those provinces experiencing moderate development in the urban commodity housing market are mainly in the central region or northeastern China, which are the old industrial bases. Those provinces with very low prices for urban commodity housing are mainly located in the western region, which has the weakest economic base and the slowest urbanization process.

The rapid growth of the urban housing market in late-developed provinces was a distinguishing feature in 2000, mainly owing to China's West Development Program. As shown in Fig. 4, although there was still regional variation in urban commodity housing, the provincial gap was not as apparent in 2000 as it was in 1995. After a round of housing reforms in 1994 (Housing Reform Steering Group of the State Council, 1994), the focus of urban housing commercialization has gradually been shifting to less-developed inland provinces, possibly in the path of China's West Development Program.

Figure 5 illustrates the spatial distribution of China's urban commodity housing prices in 2005. The government abolished the practice of welfare housing distribution by public-sector employers, including state-owned enterprises and government organizations, to their employees in July 1998 (Chiu 2001). The welfare housing that had been distributed before 1998 could still be sold in the urban secondary housing market in 2001. The supply and demand of housing in the provinces shows some regional divergence. When welfare housing in late-developed provinces was opened up for sales, the housing supply increased in the local urban housing market. The growth in urban housing in those late-developed provinces slowed down from 2000 to 2005 as a result of a sufficient housing supply and the outflow of the labor force to developed coastal provinces. In contrast, the official cessation of welfare housing distribution through *Danwei* would change the structure of urban housing provision, particularly in those developed provinces with a huge urban population such as Beijing, Shanghai, Tianjin, Jiangsu, Zhejiang, Fujian, and Guangzhou.

**Table 1** Correlation coefficient between provincial adjusted urbanization levels and urban house prices in China from 1995 to 2005

Region	Correlation coefficient	Region	Correlation coefficient
Beijing	0.534*	Henan	0.942**
Tianjin	0.857**	Hubei	0.736**
Hebei	0.635*	Hunan	0.959**
Shanxi	0.943**	Guangdong	0.426
Inner Mongolia	0.856**	Guangxi	0.986**
Niaoning	0.982**	Hainan	0.525
Jilin	0.896**	Sichuan	0.854**
Heilongjiang	0.774**	Guizhou	0.824**
Shanghai	0.796**	Yunnan	0.939**
Jiangsu	0.950**	Tibet	0.951**
Zhejiang	0.976**	Shanxi	0.812**
Anhui	0.896**	Gansu	0.703*
Fujian	0.727*	Qinghai	0.753**
Jiangxi	0.920**	Ningxia	0.927**
Shandong	0.965**	Xinjiang	0.639*

Chongqing was part of Sichuan province until 1997, when it became a Centrally Administered City

\* Level of significance: 5%

\*\* Level of significance: 1%

## 5 Relationship between urbanization and urban housing growth since the mid-1990s

China's urbanization and urban housing system are two contingent issues situated in complex historical, political, and economic contexts. In less than 20 years, China has seen a fast increase in the commodity housing price and a rapid pace of urbanization. However, from the perspective of regional development, many detailed forces, internal and external, have mingled to cause provincial variations in the urbanization process and urban housing growth. To our knowledge, this article is the first attempt to explore the regional disparities of urbanization levels and urban housing prices in China. Based on the evaluated urbanization levels and the commodity housing prices, a cross-correlation analysis was used to analyze the relationship between two sets of panel data. The findings reflect not only the provincial situation but also the time series changes since the mid-1990s (Table 1).

The results suggest that in most provinces the growth in urban house prices had a significant correlation with the levels of urbanization between 1995 and 2005, except in Guangdong and Hainan. The latter provinces have a unique correlation between urbanization levels and changes in urban commodity housing prices during the period from 1995 to 2005. Given that Hainan's real estate bubble burst in the 1990s, that insignificant result is not surprising. Soon after being designated a special economic zone in 1988, Hainan experienced an economic bubble fuelled by a housing boom. Floor space under construction in Hainan surged by 750% between 1990 and 1998 and exceeded 50 sq m per person in 1998, while that of Beijing was only 9 sq m per capita in the same period. Even though economic migrants arrived from elsewhere in China and the authorities encouraged property development in the early 1990s, Hainan's housing bubble collapsed by the end of 1998. This left 7.03 million sq m of housing unsold, a tenth of the national total in that year. Guangdong's insignificant result is in sharp contrast with the experience in Hainan province, where the large amount of temporary migrants has posed the biggest challenge to the process of urbanization and local urban housing growth. In the absence of official

annual statistics on the temporary population in China, this article uses data on the agricultural and non-agricultural population to evaluate China's provincial urbanization levels. However, this method ignores the background that Guangdong has been one of the provinces with the most migration and mobility. During the 10 years from 1995 to 2005, migration (both intra-migration and inter-migration) in Guangdong was the highest of all provinces. It surpassed Henan and Sichuan to become the most populous province in January 2005. There were 79 million permanent residents and 31 million migrants without a local *Hukou* living in Guangdong for at least 6 months of the year. If we were to take into account the temporary migrants who work and live in the cities of Guangdong but hold the rural *Hukou* (which means they are classified as agricultural population), Guangdong's urbanization levels during 1995 to 2005 would be quite different. To some extent, the systematic deviation of urbanization level in Guangdong caused by the temporary migrants may be the major reason for the insignificant correlation coefficient in Guangdong province.

With respect to other provinces, the extent of significant connection between urbanization levels and urban housing prices presents regional variations and can be classified into three categories. The first is seen among most coastal and developed provinces, such as Beijing, Tianjin, Shanghai, and Fujian. While the growth of urban housing prices in these provinces has a significant correlation with the changes in urbanization levels, the correlation coefficients are not very high, all less than 0.9. In contrast, the second category demonstrates the situation in late-developed provinces such as Qinghai, Gansu, Xinjiang, and Hebei. Most correlation coefficients in these western provinces are also fairly low. The likely reasons for these two similar results, however, are totally different. The low correlation coefficients in coastal and developed provinces are mainly due to the existing high urbanization levels in combination with a rapid increase in urban commodity housing prices. For example, while Beijing's urbanization level merely increased from 69.74% in 1995 to 83.62% in 2005, the commodity housing price in Beijing rose more than 73 percent during the same period. Data from the National Bureau of Statistics (CNBS) suggest that relatively little space has been left for expanding the urbanization level in Beijing above the current very high rate. In contrast, the commodity housing price in Beijing has been skyrocketing, rising from 4747 Yuan per sq m in 2005 to 14276 in 2009, more than tripling in just 4 years.

By contrast, the situation in the late-developed provinces is totally different. China's development policies rely on rapid coastal growth to drive economic improvement in poor inland regions. Compared with the prosperous urban housing development in coastal provinces, the urban housing growth in these late-developed inland provinces has stagnated due to the relatively slow economic development and the tendency of the labor force to move out. The scope for raising the urbanization levels in these late-developed provinces is limited in the near term, given the pressure on economic growth. However, with the national housing boom since the mid-1990s, the growth rate of commodity housing prices in these late-developed provinces is quite high, despite the fact that the absolute prices of commodity housing are much lower than in developed provinces. For example, the commodity housing price in Hebei province increased from only 706 Yuan per sq m in 1995 to 1486 in 2005.

Consider, finally, the moderately developed provinces (e.g., Liaoning, Shandong, Zhejiang, Jiangsu). Their correlation coefficients shown in Table 1 are significant and high, all distinctly greater than 0.9. Most of them have experienced both rapid urbanization and a fast increase in urban commodity housing prices. We have no direct evidence to prove the impact of urbanization on the growth of urban commodity housing in these moderately

developed provinces. Yet the high correlation coefficients suggest that the rapid urbanization process is an important factor promoting the commercialization of urban housing there. In addition, the pattern of urbanization in these provinces is shaped by the growth of medium-sized and small cities and towns. Residents of these newly designated small cities and towns are classified in statistical sources as an urban population, even though some of the labor force has remained agricultural (Ma and Lin 1993). This is a major reason why the urbanization levels in moderately developed provinces have maintained their rapid expansion since the mid-1990s. For example, Jiangsu's urbanization level increased swiftly from 1995 to 2005, almost doubling in a decade. Moreover, these provinces have experienced a similarly fast growth of urban commodity housing prices during the same period. Given the CPI deflator, Jiangsu's urban commodity housing price grew rapidly from 1995 to 2005, surging 134% in 10 years. It is clear that the development of new urban centers and the massive influx of residents from rural areas have made a significant contribution to the growth of the local commodity housing market. These factors have played important roles in promoting regional economic development and commercialization of urban commodity housing in moderately developed provinces.

## 6 Discussion

The urbanization process and the structure of urban housing provision in China have undergone a profound transformation over the thirty-plus years of economic and housing reforms. China's urbanization process and its urban housing commercialization are affected by interwoven institutional and economic factors that are situated in a complex regional context. Studies at the national level can hardly capture the dynamism of different provinces, where Deng's uneven development policy has led to a widening gap between the coastal areas and the interior (Fan 2002).

Using an improved method based on the UN technique of urbanization evaluation, this study first evaluated the annual urbanization level in each province of China during the period from 1995 to 2005. The results presented in Fig. 1 suggest a noticeable variation in the urbanization process across different provinces, reflecting the uneven nature of China's regional development. The time series results for the urbanization level suggest that each province experienced a growth of urbanization from 1995 to 2005. The cross-sectional results, in contrast, depict quite distinct regional urbanization processes across different provinces. Most of the moderately developed provinces experienced a fast increase in urbanization level between 1995 and 2005. In contrast, most of the developed provinces had a quite slow increase in urbanization levels during the same period, mainly due to their already high urbanization rates.

Uneven regional development has long been regarded as an adequate and effective policy to correct the failure of Maoist redistributive strategy (Fan 2002). However, the recent problem of labor shortage in many coastal provinces demonstrates that capitalist firms have begun to seek out new locations in inland provinces with low production costs. Predictably, those late-developed provinces situated in the interior have tremendous room for urban growth in the future, due to the enormous gap between coastal and inland provinces in urbanization rates.

Second, in recent years, there has been increasing concern about urban housing reform and the rapid increase in urban housing prices. However, the regional variation in urban commodity housing prices during China's housing reforms has not been sufficiently examined in many studies, mainly because no time series data on urban housing prices had

been available until 2002. This article is unique in that it explores China's urban commodity housing prices at the regional level from the perspective of the urbanization process. Our extrapolation suggests that most provinces have experienced a rapid increase in urban commodity housing price, though reflecting the uneven geographic structure of urban housing market across the different provinces. Relative to the CPI deflator, the regional difference in urban commodity housing could be clarified by delimiting two periods, during which China has experienced considerable regional variations in the urbanization process and migration patterns. During the first 5 years, from 1995 to 2000, the prices of urban commodity housing in most late-developed provinces grew rapidly, mainly due to China's West Development Program. But then, from 2000 to 2005, those prices in developed provinces located in the coastal region increased fast, showing at least double the rate of growth found in the late-developed provinces. A possible reason for this difference could be the remarkable shift of the labor force from rural to urban areas, whereby most of the migrants try to settle in urban areas.

In the last section of this study, a cross-correlation analysis was used to explore the relationship between urbanization and urban housing growth in each province during the 10 years from 1995 to 2005. Except for Guangdong and Hainan, the correlation coefficients in all other provinces diverge significantly from each other and present three different patterns of urbanization and urban housing growth. The relationship between urban commodity housing prices and urbanization levels in developed provinces of China is not strong, mainly due to the existing high urbanization levels, but still boosting urban commodity housing prices in these prosperous provinces. In addition, most correlation coefficients in late-developed provinces of China are also quite low, owing to the slow economic development and weak urban housing growth in these relatively undeveloped inland provinces. In contrast, the moderately developed provinces benefit from the relatively even expansion of both urbanization and urban commodity housing prices.

In short, China's urbanization process and the growth of urban commodity housing are multifaceted and complex. Along with efforts to address uneven regional development, it seems appropriate for policy-makers to consider regional conditions and trends in the urbanization process, the level and composition of population shifts from rural to urban areas, and the urban housing growth.

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