林思齊東西學術交流研究所
David C. Lam Institute for East-West Studies (LEWI)

Working Paper Series 研究報告系列

Paper Number: 107
January 2011

**Housing Inequalities under Market Deepening:
The Case of Guangzhou, China**

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Abstract

Ever escalating land and housing prices in China's major metropolises have brought widespread discontent. The general impression is that housing inequality is rising, and that housing has become increasingly out of reach of the ordinary households. Yet, to date, much of the literature on housing consumption and housing inequalities in Chinese cities is based on data gathered in the early reform period. Very little has been written on what has happened since the 1998 housing reform when both the production and consumption of housing have become marketized. The present paper aims to address this deficiency by reference to surveys conducted in Guangzhou in 1996, 2001 and 2005. Quality-adjusted inequality indices including the Gini coefficient and the Theil index are computed to compare housing inequality before and after the ending of the welfare allocation of housing at the turn of the century.

Keywords: marketization, housing allocation, inequality indices, Guangzhou

I. Introduction

Beginning from the mid 1990s, especially since the pronouncement to end of the welfare allocation of housing in 1998, the market has gradually replaced the work units and municipal housing bureaux as the main institution governing housing allocation in urban China (Li, 2005; Li and Yi, 2007a). Globally, accompanying economic globalization is the emergence of the world city system and the growing importance of "headquarters economy" in defining a city's position in the world city hierarchy. A major consequence of this is the concentration of speculative capital in the central districts of the world's leading cities and rapidly rising real estate prices (Sassen, 2001).

In China, the accession to the World Trade Organization (WTO) in 2001 further triggered massive inflows of foreign direct investment (FDI) into the country and the scramble of major transnational corporations to set up regional headquarters in China's leading metropolises, especially Beijing and Shanghai. The enterprise reform of the late 1990s, which helped transform large state-owned enterprises (SOEs) to become some of the world's largest transnational corporations, added to the quest for headquarters

construction (Li, 2005). At the same time, municipal governments, which are increasingly relying on land leasing incomes consequent upon the 1994 taxation reform, have colluded with developers to form "growth coalitions", focussing on land development (Wu, 1999; Zhu, 1999).

All these developments have resulted in ever escalating land and housing prices in China's major metropolises such as Beijing, Shanghai and Guangzhou. The media reported widespread discontents, especially among people who were not able to benefit from the heavily discounted home sales under the housing reforms of the 1990s (Li and Yi, 2007a). These people include mainly the urban poor (Wang, 2004), migrants without the proper *hukou* status in the city (Wu, 2004), and young entrants to the job markets.

While luxurious apartment buildings and gated villa communities proliferate in both the central city and the suburbs (Huang, 2005), to many newcomers to the city finding a place to live may not be an easy proposition. The highly popular TV series Woju or Living in a Snail Shell, which tells the story of a young couple's struggle to find a place to live in the country's metropolis, presumably Shanghai, is a testimony to the plight of many well educated young urban-bound migrants amidst growing prosperity.

The Chinese government is not unaware of the discontents. Indeed, building a harmonious society has been the overriding concern of the current Chinese government under President Hu Jintao and Premier Wen Jiabao. And, the ability to access decent housing has clear implications for social stability. In recent years the Chinese government has made repeated attempts to cool down the property market. For instance, SCOI (*Guo Ban Fa* or State Council Office Issuance) 2005 No. 26, issued on 30 April 2005, called for strengthening planning control and improving the composition of commodity housing production so as to stabilize home prices. To dampen speculation and to ensure adequate supply of ordinary, i.e. not luxurious, housing, SCOI 2006 No. 37, issued on 24 May 2006 stipulated the following: (i) dwellings resold within 5 years of purchase would be subject to sales tax; (ii) mortgage loans were to be capped at 70 percent of sales value; and (iii) all new housing development projects had to set aside no less than 70 percent of housing units constructed for homes of 90 m^2 or smaller.

A firm grasp of the actual situation is a prerequisite to formulating appropriate policies. Published data show consistent and highly impressive improvements in housing

conditions. Per capita living space in urban areas jumped from 3.8 m^2 in 1978 to 13.5 m^2 in 1989, and further to 26.1 m^2 in 2005, irrespective of the tripling of the urban population since the launching of the reform in 1978 (Li and Li, 2008, p.384). The quality of the housing stock has shown equally impressive improvements, and the bulk of new housing estates are now equipped with landscaped gardens and sports facilities. While private homeownership was practically non-existent in the early reform times, the urban homeownership rate reached 82 per cent in 2005 (Li and Li, 2008, p. 386). Apparently, the widespread discontents that China's urban dwellers express are not consistent with objective data. Rather than signalling further deterioration in housing conditions, the discontents likely reflect perceived or actual increase in housing inequality.

Yet, to date, much of the literature on housing consumption and housing inequalities in Chinese cities is based on data generated in the early reform period, when housing commodification was largely restricted to the supply side (Li, 2000b). At that time the main purchasers of housing built by the newly established developing companies were state work units or *danwei*, which would allocate the commodity housing units they purchased to the workers according to established guidelines (see, for example, Logan and Bian, 1993; Logan et al, 1999; Li, 2000a and b; Huang and Clark, 2002; Wang, 2003; Sato, 2006). Very little has been written on what has happened since the 1998 housing reform, which pronounced to end the welfare allocation of housing in urban China. From the early 2000s onwards, both the production and consumption of housing have been primarily market-based (Li and Yi, 2007a).

In comparison with the meticulous works on ascertaining China's income inequality as gauged by commonly employed inequality measures such as the Gini coefficient and the Theil entropy measure (Kahn and Riskin, 2001 and 2006; Sylvie, Fournier and Li, 2006), to my knowledge no attempts have been made to estimate the above comprehensive measures in respect to housing inequality. Most studies cited above either frame their analysis by describing variations in floor space consumed (see, for example, Li, 2000a; Sato, 2006), or variations in selected housing attributes (see, for example, Logan et al, 1999; Wang, 2003). A more comprehensive measure surely will provide a clearer picture of the true extent of housing inequality and how it varies over time.

In this paper I try to address the deficiency in the literature by analysing survey data conducted in the City of Guangzhou in 1996, 2001 and 2005. More specifically, I attempt to compute the above-mentioned inequality indices to gauge the variations in housing consumption among urban households, and to what extent housing inequality has increased over time. While the Gini coefficient, which is a more common measure and has the intuitive appeal of falling within the 0 (absolute equality) and 1 (absolute inequality) range, the Theil entropy measure is additive-decomposable, thus enabling the assessment of the respective contributions of within and between group variations to the overall inequality.

The rest of the paper is organized as follows. The next section spells out in detail the methodology employed, and provides further information on the Guangzhou datasets. The main empirical findings are given in Sections III and IV. Section V summarizes and concludes the study.

II. Methodology and Data

Methodology

Unlike income, housing is a multi-dimensional good with varying quality: large or small, old or new, low- or high-rise, with well or poorly fitted kitchens, with or without a lift, more or less number of rooms in the dwelling, stand alone building or building in a large housing estate. Because of this, the computation of a comprehensive housing inequality index is not straightforward. Li (2000a) used floor space as a measure of housing consumption. But obviously this did not take consideration variations in housing quality. To address this, Logan et al (1999) assigned weights to selected housing attributes. However, the weights were arbitrary and based largely on convenience.

Most economic studies on housing demand invoke the concepts of "standardized housing units" and "housing service". The latter refers to the stream of service yielded by a dwelling over a period of time. At any given point in time and controlling for location, competitive equilibrium ensures that there exists a single price for housing service. Let p be the price per unit of service, h be the amount of housing service yielded by the dwelling, and Y be the market value of the dwelling. By definition,

Y = p·h.

As p = constant, how much h a dwelling emits is proportional to Y, i.e. its market value (Olsen, 1987).

Hedonic theory (Rosen, 1974) demonstrates that this value or price can be decomposed into the price of its constituent components, variously termed hedonic or attribute price. Also, location variation in price as given by the standard economic model of urban spatial structure is a result of market clearance, reflecting both the preference for specific locations and their relative scarcities (Olsen, 1987). The typical approach to reveal the price of individual housing attributes is to regress the observed dwelling value on such variables as location, type of housing, size and age of the dwelling, and ethnic composition and other neighbourhood attributes. Different functional forms have been tried, but the simple additive function seems to be as good as any other (Linneman, 1980).

In China, where the housing market remains highly segmented, it is difficult to envisage the presence of a unified market clearing price for housing. In particular, for reform housing, or housing sold to sitting tenants by work units under the reform, and the remaining stock of rental housing provided by work units and the municipal government, the observed dwelling value cannot be used as a measure of housing service. However, it may be argued that in the commodity sector housing price is determined primarily by supply and demand. Regression based on only observations in this sector yields estimates of the price of individual housing attributes. For dwellings in non-market sectors, the amount of housing service that a dwelling emits can be obtained by inserting the respective attribute values in the estimated regression equation.

More specifically, let Y_i be the value or price of dwelling i and $\hat{Y}_i$ be the predicted value of i based on the estimated equation, i = 1,.....,n, where n = total number of observations. The vector of housing attributes, including dwelling location, is given by $\mathbf{X}_i$. For simplicity, suppose that there are only two housing sectors, commodity and non-commodity.[1] Let n_1 = number of observations in the commodity sector, and n_2 = number in the non-commodity sector. Clearly, $n = n_1 + n_2$.

The procedure for computation is as follows. First, regress Y on $\mathbf{X}$, using the n_1 sub-sample. Then, compute $\hat{Y}_i$ using the estimated regression equation for all observations in

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[1] Extending this to k sectors, where k is any integer, is straightforward.

the sample, i.e. for i = 1,….,n. Third, compute the given inequality index using $\hat{Y}_i$, i = 1, …., n. The purpose of using of the predicted instead of observed values also in the commodity sub-sample is to minimize the effect due to random fluctuations.

The Theil entropy index belongs to a family of additive-decomposable indices and has been widely employed to gauge how much the overall level of inequality is due to variations within population groups and how much to variations between groups (Shorrocks, 1980; Conceição and Ferreira, 2000). Stratify the sample by housing types or population groups and decompose the Theil index of inequality accordingly. This allows the assessment of the relative contributions of intra- and between sector or group variations in housing consumption.

Data

With the assistance of the Centre of Urban and Regional Studies at Sun Yat-sen University, Guangzhou, I conducted a series of large-scale household surveys to unravel the housing consumption conditions of households in Guangzhou under the reform.

The first survey was undertaken in 1996, with a target sample of 1000 households or, equivalently, housing units. This survey only covered newly constructed commodity housing or housing put up for sale by developers at market price. The 1996 survey was carried out prior to the ending of the welfare allocation of housing. In Guangzhou supply-side commodification was well under way. Yet the main buyers of commodity housing then were the individual *danwei*, which bought the commodity housing units for subsequent allocation to their workers according to established rules. The latter include considerations such as seniority in the workplace, whether or not both the husband and the wife work in the same *danwei*, occupational rank, and membership and position in the Chinese Communist Party (Li, 2000; Logan et al 1999).

In the sample only about 25 per cent of households purchased or rented directly in the open market. The rest was subsidized housing, including housing provided to households affected by redevelopment programmes as compensation. Thus, to a certain extent the sample represented a snapshot of the distribution of households across different housing types in Guangzhou. Nonetheless, caution has to be exercised in interpreting the survey findings. By definition, all households in the sample were recent movers.

Moreover, they were either those who were privileged enough to be assigned new apartments by the given *danwei*, or those who were able to purchase or rent in the open market. All these suggest a built-in bias towards better-to-do groups. As such, the degree of housing inequality revealed by the sample is likely to be an underestimate of the true extent of housing inequality for the population as a whole. Comparisons with subsequent years based on the 1996 survey therefore give the lower bound of the increase in housing inequality over time.

The 2001 and 2005 surveys were meant to be general surveys, with the target population being all households in Guangzhou. Because of this, additional information was sought in respect to the age of dwelling and, for owners, the year of purchase. These surveys also covered "economic and comfortable housing", a form of social housing supposedly built for lower- and middle-income households, as well as "self-built housing", which was usually built by villagers on former agricultural lands in suburban districts. The 2001 and 2005 surveys also provide information on the presence or absence of lifts in the dwelling; the latter survey also inquired whether the housing unit was purchased by the household directly from the developer (primary market) or purchased in the secondary market. The target sample size of the 2001 survey was 1500, whereas that of the 2005 survey was 1200.

For all three surveys, a multi-level probability proportional to size (PPS) sampling strategy was adopted. For the 1996 survey, the list of presale commodity housing projects was used to construct the sampling frame. For the 2001 and 2005 samples, residents' committee-level (the lowest-level local authority in a city) population data provided by the public security bureau were employed. In each incidence, the sample was designed so that the number of housing units surveyed in each of the original eight urban districts of Guangzhou was proportional to the total number of households or housing units in the district.[2] In the case of the 2005 survey, the sample also included the northern part of Panyu District, which had undergone rapid urban development since the late 1990s. Within each urban district, a number of "streets" or sub-districts were selected on a

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[2] The original eight urban districts of Guangzhou were: Liwan, Yuexiu, Dongshan, Haizhu, Tianhe, Fangcun, Baiyun and Huangpu. In 2005, Yuexiu and Liwan were merged; so were Liwan and Fangcun. Also the former cities of Panyu and Huadu were annexed earlier in 2000 to become urban districts of the City of Guangzhou, and the southern part of Panyu was since carved out to form the District of Nansha.

randomized basis in accordance to the size distribution of the sub-districts. This geographically based sampling strategy ensured adequate representation of different types of residential areas and of all geographical districts of the city.

III. Hedonic Price Equations

Table 1 provides the results of hedonic price estimations. In all equations the dependent variable, price, is expressed in the logarithmic form. This ensures that the predicted home price or value is non-negative. Floor area and number of rooms are also expressed in the logarithmic form. Thus, the corresponding regression coefficients give the elasticity, i.e. percentage change in house price resulting from one percent change in the respective predictor, holding other variables constant. The coefficient of a given dummy variable gives the percentage difference in price between it and the reference class.

[Table 1 about here]

The R^2 obtained, which ranges from 0.43 to 0.65, compares well with similar studies conducted elsewhere. The coefficient estimates in general show the expected signs and are of reasonable magnitudes.

Reflecting rapid changes in the urban spatial structure (Li, 2010), especially with the rapid development of Tianhe as Guangzhou's new central business district (CBD) in the 1990s, the completion of a large number of bridges and tunnels crossing the Pearl River, and the gradual extension of the Guangzhou Metro to suburban areas, increasingly Haizhu, Tianhe and Fangcun are no longer considered outlying. In 1996 home prices in these districts were some 10-20 per cent lower than those in the old urban core of Liwan, Dongshan and Yuexiu. In 2005 the differences were much smaller in magnitude and no longer significant statistically. However, home prices in Baiyun and Panyu remained substantially lower than those in the old urban core.

The findings also suggest that households in Guangzhou are attaching greater importance to dwelling design over time. First, the number of rooms within a residential

unit, which was insignificant in the 1996 and 2001 equations, became a highly significant factor in the 2005 equation. Holding floor area constant, in the latter period an extra room would increase the value of a dwelling by 17.9 per cent. The result suggests that privacy provided by a room of one's own is of increasing importance in everyday life in Guangzhou. Second, higher floors usually are associated with better lighting, ventilation and privacy. Indicative of change in taste, it is only in the 2005 equation that higher floors commanded a price premium (in the order of 8 per cent) over lower floors. Of course, the availability of lift service would further enhance the premium. Third, related to the above, the 2005 equation showed that provision of recreation facilities in the housing estate raised home price by an average of 4.7 per cent.

Confirming the general impression, home price in the primary market commands a premium over price in the second hand market. The 2005 equation showed that the former was, on average, 18 per cent higher than the latter, everything else being constant.

New buildings too command higher prices. But, reflecting the general inflation of home prices, the greatest difference lies on the year of purchase. The 2005 equations suggested that those who bought in the 2000s had to pay some 42.4 per cent higher in price than those who bought in the 1980s or before, other variables being constant.

Apparently, households in Guangzhou are quite receptive to paying estate management fee, provided that higher management fee means better service. This variable had positive and significant effects on home price in all three years.

IV. Housing Inequality Indices

Overall inequality level

The relatively high explanatory powers of the regression equations and the reasonableness of the coefficient estimates give confidence in employing the equations to estimate the amount of housing service yielded by individual housing units and then construct the housing inequality indices. The result of the computation is provided in Table 2. For comparison purpose, the Gini coefficients based only on floor area are also given.

[Table 2 is about here]

The Gini coefficients based on floor area did not exhibit any increasing trend. It was 0.21 in 1996; 0.226 in 2001; and 0.21 in 2005. Judging from the fact that the 1996 sample was targeted only at newly constructed commodity housing units and hence by construction was relatively homogeneous in terms of housing quality, the lack of increase in the inequality index in the latter years was all the more surprising.

The Gini coefficients based on the hedonic regression estimations were more in line with the general impression of rising housing inequality. It rose from 0.277 in 1996 to 0.321 in 2001, and then modestly to 0.332 in 2005. The Theil entropy index showed a similar trend: from 0.125 in 1996, to 0.164 in 2001, and then to 0.177 in 2005. As the 1996 data pertained only to newly built commodity housing units, it is useful to restrict our attention to the commodity housing sector, especially the owned-commodity housing units. Decomposing the Theil Index according to housing type shows that inequality within the owned-commodity sector remained comparatively low and quite stable over time: it was 0.094 in 1996; 0.113 in 2001; and 0.119 in 2005 (Table 3). The slightly lower value for 1996 could be attributed largely to the fact that the 1996 survey covered only new commodity housing. However, reflecting the growing prevalence of owned-commodity housing in more recent years (14.9 per cent of the sample housing units in 2001; 44.8 per cent in 2005), in 2001 variations within this sector contributed 14.2 per cent to the overall inequality; in 2005 they contributed 39.8 per cent. To a significant extent, then, inequality in housing consumption today reflects inequality in the owned-commodity housing sector.

[Table 3 about here]

Variations between housing sectors

The decomposition of the Theil Index by housing sectors also reveals other interesting findings. While in all three years within sector inequalities accounted for the bulk of the overall housing inequality, the share of within sector inequalities declined from 82.45% in 1996 to 73.09% in 2001, and further to 68.70% in 2005. In part, this

could be attributed to the relative homogeneity of the 1996 sample. In part, however, this could reflect actual increase in the difference in quality between housing sectors.

This is confirmed by computing the mean predicted home price, the result of which is also given in Table 3. In all three years the mean predicted price of owned-commodity housing was either the highest (for the 2001 and 2005 samples) or second highest (for the 1996 sample) among all housing sectors. Moreover, the difference between owned-commodity housing and other sectors was the largest in 2005. In other words, those who were able to buy commodity housing enjoyed better housing than people living in other types of housing, and the relative supremacy of owned-commodity housing had strengthened over time.

Housing provided by the municipal housing bureau was of relatively poor quality in all three years. But the result showed that with the mass disposal of work-unit housing in the late 1990s, the remaining stock of work-unit rental housing was of equally poor quality in more recent times. It may be concluded that those who were left behind in the public rental sector experienced relative or even absolute declines in their housing lots under the housing reform. Because of the decreasing share of work-unit rental housing, the sector's contribution to the overall housing inequality decreased from 40.4 per cent in 1996 to 5.9 per cent in 2001, and 1.6 per cent in 2005.

In comparison, reform housing or housing which was sold to sitting tenants at heavy discounts was of relatively decent quality in all three years. Moreover, the degree of housing inequality within the reform housing sector was consistently low in all samples: the Theil index was 0.052 in 1996, 0.096 in 2001, and 0.069 in 2005. With the conferment of full property rights to most reform housing purchasers, reform housing too, has become trivialized. As a result, the sector's contribution to the overall inequality decreased from 21.56 per cent in 2001 to 4.87 per cent in 2005.

Economic and comfortable housing was projected to be the main form of social housing under the 1994 and 1998 housing reforms (Li and Li, 2008). A few observers point out that many economic and comfortable housing projects are in fact commodity housing in disguise (Zhang et al, 2010). Confirming this observation, in both 2001 and 2005 samples the mean market-equivalent home value of this sector was only slightly lower than that of the owned-commodity sector. While in both years the Theil index was

lower than the overall value, variations within the sector were smaller in 2005 (Theil index = 0.073) than in 2001 (Theil index = 0.116), suggesting growing homogeneity within the sector.

Individuals who were forced to relocate because of urban redevelopment are often seen as being underprivileged (Wu, F-L, 2004). However, a study conducted in Shanghai found that relocated households in fact are quite satisfied with their current residence (Li and Song, 2009). Echoing this finding, in all three Guangzhou samples the mean market-equivalent price of owned-relocated housing was only slightly lower than that of reform housing. In other words, like reform housing, owned-relocated housing was of relatively decent quality, far better than the conditions of the remaining stock of work-unit and housing bureau rental housing.

But for those relocated households who could not afford to buy and had to live in rental housing provided by the developers, their housing conditions were not much better than those who continued to rent work-unit and housing bureau housing. This was especially the case in the most recent year, i.e. 2005. The owner-renter divide in terms of housing consumption was quite apparent for compensation housing. An examination of the Theil indices shows that inequality within the compensation housing sector experienced consistent increases. For rented-compensation housing, the Theil index was 0.094 in 1996, 0.0755 in 2001, and 0.302 in 2005. For owned-compensation housing, the respective values were: 0.063, 0.112 and 0.184.

Under China's land tenure system, land in rural areas is the property of rural collectives, which essentially mean village committees. In actuality rural land is controlled by individual peasant households. Every peasant household is entitled to build a house as its residence on a plot of land designated by the respective village committee. In Table 3, self-built housing is mainly the housing built by peasants on (former) urban-rural fringe. With urban expansion many former rural villages are now encircled by urban development. Such villages are termed urban villages (Wu, W-P, 2004). Much of the housing in urban villages is of dubious quality and legal status. It was constructed to generate rental income. The bulk of this housing is rented to migrant workers. But a substantial portion of self-built housing was also built for the former peasants' self consumption. In the 2001 sample, the average predicted or market-equivalent home value

for self-built housing was only RMB 55,500, which was about the same as that of work-unit rental housing. In the 2005 sample, the stock of self-built housing was of much better quality, with the mean market-equivalent value standing at RMB 150,300, as compared with work-unit rental housing's RMB 99,100. Theil index computation shows that housing inequality in this sector was close to the overall inequality level of the city in both 2001 and 2005.

Decomposition by socio-demographic attributes

To analyse how housing inequality varies over socio-demographic groups as defined by age, occupational status and *hukou* status of the head of household, I compute both the mean predicted home values of the resultant population groups and the associated Theil indices. The former computation supports the general impression that housing inequality between occupational groups has increased with market deepening. In particular, while the differences in the mean market-equivalent home values were quite small among occupational groups in the 1996 sample, professional and managerial workers, on average, enjoyed much better housing, than other workers in both 2001 and 2005 samples. This increase in housing inequality between occupational groups over time is confirmed by the Theil indices. Whereas between group variations only contributed to 5.30 per cent of the overall inequality in 1996, in 2001 and 2005 they contributed to 12.25 per cent and 13.17 per cent, respectively.

Despite the general impression of widespread discontents among young people referred to above, the results of Theil index computation indicate that variations between age groups contributed no more than 1.5 per cent to the overall level of housing inequality. More surprisingly, it was only in 1996 that the mean market-equivalent home value for young households was somewhat the lower than other age groups. In both 2001 and 2005 samples, young households on average lived in homes with the highest market-equivalent values. It was the older people that were relatively less well off.

Regarding *hukou* status, because of the sampling design, the 1996 respondents with non-local *hukou* were primarily those better-off households who were able to buy commodity housing in the open market with the view to obtaining the Guangzhou *hukou* status. As such it was not surprising they consumed somewhat better housing than local

hukou holders. The 2001 and 2005 samples were meant to represent the population at the time of survey. The mean predicted home value for non-local *hukou* holders in the 2001 sample continued to be higher than that for local *hukou* holders. The 2005 survey yielded results more in line with expectation: the mean predicted value for local *hukou* holders was some RMB 44,500 or 25.3 per cent higher than that for non-local *hukou* holders. However, the Theil index decomposition shows that housing in all three samples the observed housing inequality was almost entirely attributed to variation or inequality within *hukou* groups.

V. Summary and Conclusions

By employing hedonic price regressions and using survey data collected in 1996, 2001 and 2005, the present paper provided quality- and location-controlled estimates of the degree of housing inequality in Guangzhou before and after the ending of the welfare allocation of housing in China in 1998. The quality- and location-controlled inequality indices show an increase in housing inequality in the later survey years, as compared with 1996. However, decomposing the Theil index shows that within the owned-commodity housing sector the level of inequality was relatively low for all three years. Moreover, the increase in inequality within this sector was quite small. Much of this increase could be attributed to the fact that the 1996 sample contained only newly completed commodity housing units.

The results also show that the differences in housing conditions between housing sectors as gauged by their percentage contributions to the overall inequality were larger in the more recent samples. Naturally, those in the owned-commodity sector enjoyed better housing than others. This was followed by buyers of economic and comfortable housing. Policy restrictions suggest a high degree of homogeneity of economic and comfortable housing. The sector-specific Theil indices confirm this. This was especially the case in 2001 and 2005. Owners of reform housing also enjoyed relatively decent housing. Moreover, inequality within this sector was low for all three samples. People who were trapped in the remaining stock of work-unit and housing bureau rental housing had to endure the worst housing conditions in more recent times. There have been frequent

stories of immense sufferings of residents uprooted by redevelopment programmes. The findings of the present study depict a rather mixed picture, however. Those who were offered and able to purchase compensation housing tended to enjoy relatively good housing. However, the housing conditions for those who had to rent were as poor as those of the remaining work-unit rental housing residents.

Decomposing the Theil index by socio-demographic groups also yields quite unexpected results. In particular, in almost every instance within group variations contribute to 85 per cent or more of the overall housing inequality. In the case of decomposition by *hukou* status for the 2005 sample, within group contributions amounted to close to 100 per cent. Similarly, in the case of decomposition by age groups, within group variations contributed to 98.5 per cent or more to the overall inequality for all three samples. The findings simply do not support the view that younger households are the losers of the market-based 1998 housing reform.

The results obtained are not in total agreement with the common perception of rapidly rising housing inequality in China. Perhaps this relatively lack of increase in housing inequality is restricted to the case of Guangzhou. Perhaps it should also be pointed out that market institutions were more established in Guangzhou even before the 1998 housing reform because of the influence of Hong Kong. In cities where the state sectors had a much stronger dominance over the economy and society, and where *danwei* provision of housing was much more entrenched, the picture could be somewhat different. It would be useful to conduct studies using data from other cities in future to provide a comparative perspective. But the Guangzhou findings do suggest that the general impression of rising housing inequality may not reflect reality. Given rapid increase in income levels, most households in Guangzhou would have benefited from the prolonged housing construction boom. Yet, it is often the subjective perception of increasing inequality that causes widespread dissatisfaction and even social discontents. This could arise from, for example, the rising aspirations for homeownership especially among young professionals and the increasing difficulty to fulfil this dream because of rapid increase in home prices. An important factor underlying the rising aspirations, for course, is developers' aggressive advertising campaigns promoting super luxurious villa housing and condominiums as the dream home.

Regardless of the inconclusiveness of the findings, calming social discontents arising from perceived inequalities is nonetheless important. The huge increase in urban population due to migration means that the number of households suffering from inadequate housing provision is huge, whether or not the perception of increasing and immense housing inequality is supported by facts. In addition to introducing measures to control rampant speculation in the property markets, in recent years there has been a subtle change in policy discourse from one of promoting private ownership to renewed interest in social housing, including the construction of cheap rental housing (*lianzu fang*) by municipal governments. For instance, SCOI 2010 No 4 issued on 1 January 2010 set a target of providing decent housing to some 15.4 million urban households currently living inadequate housing by 2012 either in the form of economic and comfortable housing or as cheap rental housing. But this change in policy emphasis has to be backed up by adequate funding support to local governments, which have to rely on land-related revenues to finance their ambitious developmental plans to date (Wu, 1999; Zhu, 1999).

Table 1. Hedonic Price Equations: Guangzhou Commodity Housing Units 1996, 2001 and 2005 (Depending Variable: Log Price in RMB 10000)

	1996		2001		2005	
	B	t	B	t	B	t
(Constant)	-0.240	-0.958	-0.520	-1.699	-0.409	-2.393*
District [1]						
Haizhu	-0.098	-2.671**	0.065	1.309	-0.042	-1.303
Tianhe	-0.193	5.046***	0.089	1.638	-0.020	-0.658
Fangcun	-0.198	4.602***	-0.168	-2.227*	0.097	1.155
Baiyun+huangpu	-0.325	6.993***	-0.028	-0.549	0.135	3.537***
Panyu					-0.092	-2.959**
Log floor area	1.055	7.058***	0.688	3.728***	0.588	5.891***
Log N rooms	-0.133	-0.853	-0.108	-0.734	0.179	2.160*
Recreation Facility (1 = yes)					0.047	2.238*
Flat Floor						
Floor 5-9	-0.035	-0.657	0.067	1.904	0.020	1.059
Floor 10+	0.009	0.150	0.061	0.862	0.082	2.066*
Lift (1 = present)					0.052	2.450*
Firsthand Purchase (1 = yes)					0.182	8.929***
Year of Construction						
Built 1990s			0.213	2.846**	0.111	3.982***
Built 2000s			0.306	3.714***	0.078	2.364*
Year of Purchase						
Bought 1990s			0.221	4.390***	0.351	8.392***
Bought 2000s					0.424	9.731***
Management Fee						
fee 50-99	0.086	2.223*	-0.024	-0.561	0.000	-0.021
fee 100+	0.112	2.463**	0.229	2.698**	0.104	3.909***
R Squared	0.491		0.435		0.650	
N	258		196		517	

Notes: * $p<.05$; ** $p<.01$; *** $p<.001$.
(1) Reference: The old urban core of Liwan, Yuexiu and Dongshan

Source: Survey data

Table 2. Housing Inequality Indices

	1996	2001	2005
Gini Coefficient (floor area)	0.198	0.226	0.210
Gini Coefficient (controlled for housing quality)	0.277	0.321	0.332
Theil Index	0.125	0.164	0.177

Source: Computed by the author

Table 3. Theil Indices Decomposed by Housing Sectors and Predicted Mean Home Value

	1996			2001			2005		
	Entro-py Index	% Contri bution	Predicted mean home value [1]	Entro -py Index	% Contri bution	Predicted mean home value [1]	Entro -py Index	% Contri bution	Predicted mean home value [1]
Rent work-unit	0.120	40.42	39.78	0.205	5.90	7.50	0.153	1.66	9.82
Rent Housing Bureau	0.079	1.43	21.16	0.193	7.50	5.41	0.246	3.90	9.91
Rent Market	0.146	3.97	54.22	0.133	9.02	11.19	0.138	6.28	16.36
Rent Free	0.173	2.17	35.30	0.132	4.51	9.88	0.125	1.07	18.89
Rent Compensated	0.087	6.27	28.72	0.076	1.25	10.83	0.302	0.48	9.19
Owned Commodity	0.094	24.09	46.88	0.113	14.19	14.68	0.119	39.84	28.80
Owned Reform	0.052	1.86	32.95	0.096	21.56	12.41	0.069	4.87	17.73
Owned Compensated	0.063	2.21	26.48	0.112	4.91	10.12	0.184	3.13	15.68
Economic & Comfortable Housing				0.116	1.42	11.44	0.073	2.07	25.17
Self-Built Housing				0.149	2.82	5.55	0.177	5.41	15.03
All Sectors	0.125			0.164			0.177		
Within Group		82.45			73.09			68.70	
Between Group		17.05			26.91			31.30	

Notes: (1) The unit is RMB 10000. Current (1 December 2010) exchange rate: USD 1.00 = RMB 6.68 approximately.

Source: Computed by the author.

Table 4. Theil Indices Decomposed by Socio-demographic Attributes and Predicted Mean Home Value

	1996			2001			2005		
	Theil Index	% Contribution	Predicted mean home value [(1)]	Theil Index	% Contribution	Predicted mean home value [(1)]	Theil Index	% Contribution	Predicted mean home value [(1)]
a. By Occupational Group									
Professional	0.109	9.19	37.70	0.092	4.16	14.84	0.113	6.60	29.67
Managerial	0.111	35.52	42.71	0.119	25.92	13.09	0.126	24.80	26.15
Skilled	0.133	16.26	32.23	0.153	28.59	10.05	0.157	19.06	18.43
Unskilled	0.128	5.30	29.87	0.177	17.41	8.11	0.173	13.62	15.28
Others	0.123	28.43	39.73	0.188	11.66	8.90	0.206	22.74	22.96
All Sectors	0.125			0.164			0.177		
Within Group		94.70			87.74			86.83	
Between Group		5.30			12.26			13.17	
b. By Age Group									
Young	0.114	32.27	36.14	0.148	40.53	11.47	0.153	40.40	23.17
Middle	0.127	50.20	39.55	0.167	51.94	10.13	0.189	55.44	20.76
Old	0.135	16.47	41.57	0.220	05.99	8.99	0.332	02.88	16.06
All Sectors	0.125			0.164			0.177		
Within Group		98.93			98.46			98.72	
Between Group		01.07			01.54			01.28	
c. By *Hukou* Status									
Local	0.113	79.79	36.93	0.163	91.92	10.49	0.178	92.22	22.17
Non-local	0.137	13.08	57.03	0.157	07.41	12.57	0.144	6.58	17.60
All Sectors	0.125			0.164			0.177		
Within Group		92.88			99.32			98.80	
Between Group		07.12			00.68			01.20	

Notes: (1) The unit is RMB 10000. Current (1 Dec 2010) exchange rate: USD 1.00 USD = RMB 6.68 approximately .

Source: Computed by the Author.

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