

**Does Market-Based Housing Offer Higher Housing Satisfaction to Urban  
Residents than Other Housing Access in China?  
Evidence from the 2005 Beijing Livable City Evaluation Survey**

Yizhao Yang, Wenzhong Zhang, Zhilin Liu, and Yao Li

© 2012 Lincoln Institute of Land Policy

**Lincoln Institute of Land Policy  
Working Paper**

The findings and conclusions of this Working Paper reflect the views of the author(s) and have not been subject to a detailed review by the staff of the Lincoln Institute of Land Policy.

Contact the Lincoln Institute with questions or requests for permission to reprint this paper. [help@lincolninst.edu](mailto:help@lincolninst.edu)

**Lincoln Institute Product Code: WP13YY1**

## **Abstract**

Tremendous changes have been made to China's urban housing since the housing policy reform began 30 years ago. These changes can be objectively assessed in terms of housing supply, housing quality, and housing access options available to urban residents. But using residents' subjective assessment to evaluate the impacts of housing policy reform has been very limited. This paper uses urban residents' housing satisfaction as a basis to see if housing obtained through post-reform transitional market can deliver higher satisfaction levels to their residents than housing accessed through other options. We take advantage of a large-scale 2005 residential satisfaction survey data that was collected to assess City of Beijing's livability. Based on more than 6000 sample cases we conduct statistical analysis to study residents' satisfaction toward their housing in relation to their housing access types.

Our analysis shows that residents who acquired housing through the housing market were more likely to be satisfied with their housing than those living in similar housing that were acquired from other housing options such as affordable housing, past public housing, and replacement housing. Accessing housing in the market can improve the chance of obtaining satisfactory housing especially for low-income residents. Since low-income residents who lived in affordable housing units were less likely to be satisfied with their housing than their counterparts living in market housing, we suggest that a more effective policy to solve low-income residents' housing problem is to allow them more opportunities to obtain housing through market mechanism (e.g., housing voucher).

**Keywords:** People's Republic of China, Housing, Land Use, Planning, Urban, Development, Suburban, Economics

## About the Authors

**Yizhao Yang** is an Assistant Professor in the Department of Planning, Public Policy and Management at the University of Oregon. Professor Yang has a Bachelor of Architecture from Tianjin University, China; Master in Building Science from Tsinghua University, China, and Master and Ph.D. in urban planning from Cornell University. Dr. Yang's research interests focus on the social and behavioral impacts of physical planning and design, particularly issues related to good urban form supportive of "green" behavior. Contact: [yizhao@uoregon.edu](mailto:yizhao@uoregon.edu)

**Wenzhong Zhang** is a senior researcher at the Institute of Geographic Science and Natural Resource Research, Chinese Academy of Science. He is Vice Director of the laboratory of economic geography and regional development and the Secretary-General of academic research committee of urban and regional development strategy and China's development strategy committee. His research focuses on the study of urban and regional development. Dr. Zhang holds Ph.D. from Northeast Normal. Contact: [zhangwz@igsnr.ac.cn](mailto:zhangwz@igsnr.ac.cn)

**Zhilin Liu** is an associate professor in the School of Public Policy and Management, Tsinghua University, Beijing, China. She received her Ph.D degree in city and regional planning from Cornell University in 2007. Her main research interests are in affordable housing policy, urban planning and governance, sustainable development, and new institutionalism theory. Contact: [zhilinliu@tsinghua.edu.cn](mailto:zhilinliu@tsinghua.edu.cn)

**Yao Li** holds a master degree in Public Administration from University of Oregon. She is currently working in Beijing, China.

## Acknowledgements

Research sponsored by the Peking University–Lincoln Institute Center for Urban Development and Land Policy and National Natural Science Foundation of China (Grant No. 40801056)

## Table of Contents

1. Introduction.....	1
2. China’s Urban Housing Policy Reform and Its Impacts on Housing Consumption.....	2
2.1 Summary of Policy Reform and Impacts .....	2
2.2 Lack of Subjective Assessment.....	6
3. Housing Satisfaction—Concepts, Research Methods, and Evidence.....	7
3.1 Definition and a Conceptual Framework .....	7
4. Research Design and Methodology—A Case Study of Beijing.....	9
4.1 The Study Area: Beijing.....	9
4.2 Data .....	11
4.3 Concepts, Variables, and Descriptive Statistics .....	11
5. Findings .....	14
6. Discussion and Policy Implication.....	19
References.....	21
Appendix.....	24

# **Does Market-Based Housing Offer Higher Housing Satisfaction to Urban Residents than Other Housing Access in China? Evidence from the 2005 Beijing Livable City Evaluation Survey**

## **1. Introduction**

Housing policy reform in China was launched more than 30 years ago, which eventually has transformed urban housing from a welfare provision to a market-oriented system. It has brought tremendous changes to urban housing in China in various aspects. Government statistics and reports clearly demonstrate direct impacts of the reform on increasing housing supply, improving urban housing quality, and changing spatial distribution of urban housing (Wang, 1999; Zhu 2007). Objectively speaking, compared with the pre-policy reform era urban residents in China now enjoy larger and better housing and greater freedom in choosing housing types and location.

A different approach to assessing the impacts of the housing policy reform is to use residents' subjective assessment as a basis to see if housing supplied in the post-reform era or obtained through post-reform transitional market can deliver high satisfaction levels to their residents. Residential satisfaction addresses the relationship between people and their residential environments. Western literature has suggested that residential satisfaction is an important measure that can be used to compare different residential settings and to predict such housing behaviors as location choice and residential mobility (Francescato, 2002). More importantly improved understanding of residential satisfaction can be of great importance to the evaluation of the success of China's housing policy reform and can inform policies aimed at prioritizing public investment and intervention in transitional housing market.

Drawing from literature on quality of life, subjective wellbeing, and residential satisfaction, this paper uses housing and residential satisfaction as an evaluative indicator to compare perceived quality of housing consumption in relation to multiple housing attainment avenues. These housing attainment avenues co-exist in the post-reform transitional housing market, and include housing obtained through past welfare housing system (i.e., privatized public housing or renting welfare public housing), housing obtained through market-based transaction (i.e., purchasing or renting private housing), and housing acquired through quasi-market mechanism (i.e., government subsidized and allocated affordable housing).

The objectives of this research are two folded—first, we examine whether market-based housing access offers better satisfaction compared with other types of housing access options, since one of the major goals of the housing policy reform was to use market mechanism to solve China's urban housing problems in the late 1970s. Second, we focus on middle- to low-income households, a typically vulnerable group in market competition, and investigate whether this group benefit from the market-transition resulting from the housing policy reform. We take advantage of a large-scale 2005 residential satisfaction survey data that was collected to assess City of Beijing's livability. Based on more than 6000 sample cases we conduct statistical analysis to study residents' satisfaction toward their housing in relation to their housing access types.

This paper consists of six parts. Following the introduction, part two provides a review of satisfaction research based on market-oriented housing systems and summarizes current studies on residential satisfaction in China. Part three provides a short overview of housing policy reform in China and discusses the impacts of the reform on important factors affecting housing and residential satisfaction. Part four introduces our study case, the City of Beijing, and presents the survey data used in our analysis. Part five presents our analysis findings, followed by part six which provides discussion and conclusion.

## **2. China's Urban Housing Policy Reform and Its Impacts on Housing Consumption**

### **2.1 Summary of Policy Reform and Impacts**

Extensive review of China's urban housing policy reform is provided by Wang (1999), Wang and Murie (2000), and Liu (2007). From 1979 to 2005, housing reform in China has been an experimental, incremental, yet steady process. By the end of 2000, the housing reform touched upon almost every aspect related to housing, from investment, construction, allocation, to maintenance. We summarize the changes in these areas in Table 1.<sup>1</sup>

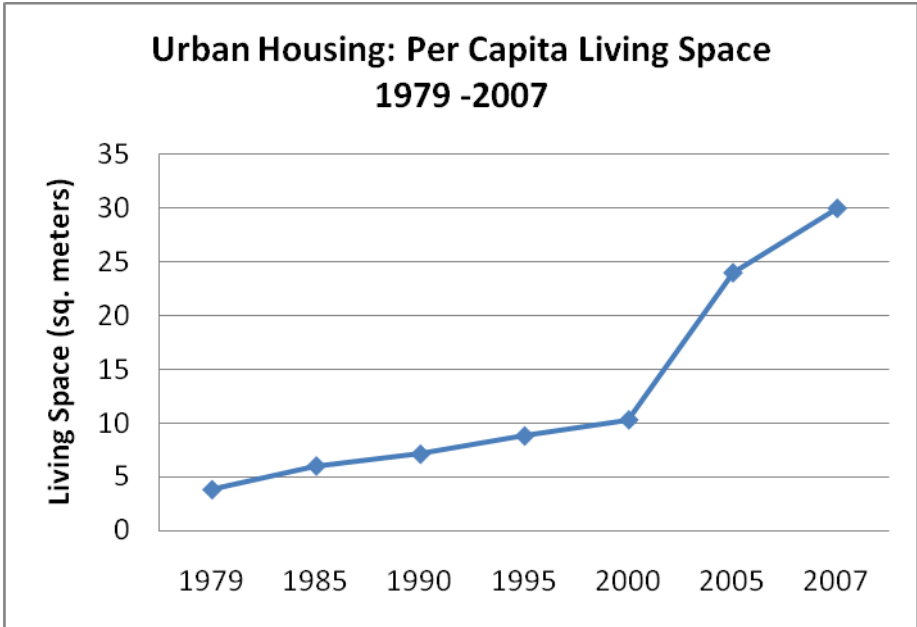
The impacts of housing policy reform can be summarized in three aspects: 1. improving housing consumption in both quantity and quality, 2. increasing homeownership rate that redefines the social meaning of housing, 3. allowing housing consumers greater choices and freedom in housing access.

Larger housing and better neighborhood: Housing policy reform has allowed increased supply of better and larger housing. Accompanied these changes in housing supply are rising housing consumption for average urban households. From 1978 to 2007, the per capita living space in urban China increased from 4.5 sq. meters to 30 sq. meters (see Figure 1). Housing unit design also becomes more sensitive to residents' living experience with more functional and psychological considerations. For example, Chen (2003) evaluated the housing facilities through a pilot housing project. He noted that new unit types were designed with a short corridor from the entry door to serve as a transitional space between the door and the main rooms; bedrooms were designed with larger space for the leisure purpose; dining rooms were designed for daily use and commonly found in the living room; and service areas were also highly concerned with function. Yet, some major problems—such as monotonous housing forms, incomplete equipment, and low quality of construction—are still no uncommon in many housing projects (Feng, 2003; Tan, 1994).

---

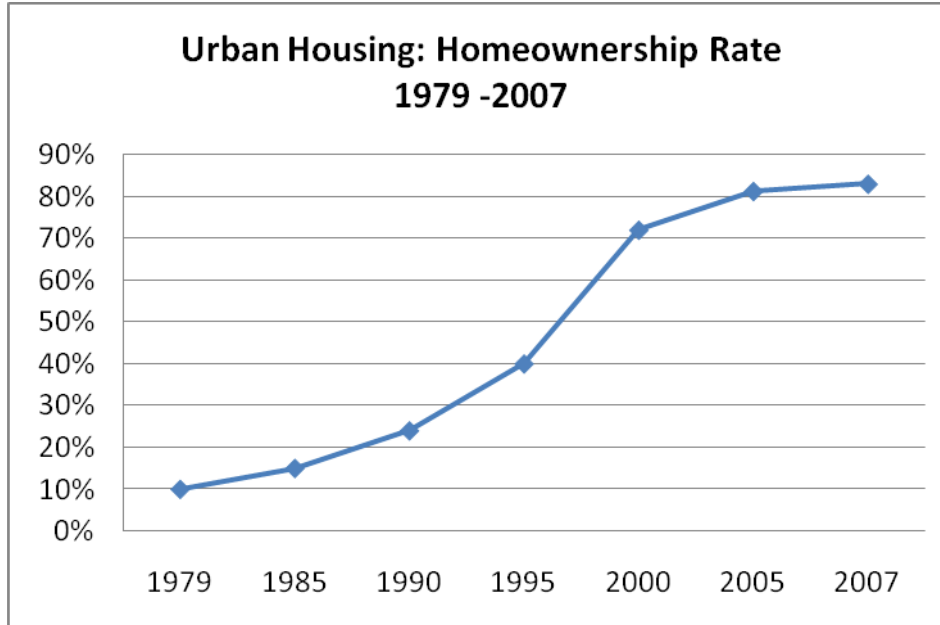
<sup>1</sup> Table 1 is in appendix.

**Figure 1. Per Capita Living Space Change in Cities in China, 1979-2007**



Home ownership: The reform’s most striking impact on urban housing consumption is probably the changes in homeownership rate, which rose from a tiny fraction of 5% at 1978 to above 80% within 20 to 30 years. In the 2000 National Population Census, 72% of urban households were reported as homeowners (NBSC, 2003, p.1865; from, Li & Yi, 2005), compared to only about 20% in the 1980s and 46% in 1996 (Huang & Clark, 2002; Li & Yi, 2005). But homeownership was not readily accepted at the beginning of the policy reform when the almost all urban residents lived in public rental housing provided by their employers or municipal governments. Chen (1996) showed that people were resistant to the idea of becoming homeowners because acquiring housing ownership incurred high costs and also transferred responsibility of housing maintenance to the owner. Thus the cost of owning a housing unit is higher for a family compared to the rent it used to pay for living in the same housing unit. Now more that 87% of urban residents own their own housing units (Man et al, 2010). As housing price continues to increase, housing has become the largest investment that an urban household can possess. While it is evident that homeownership is closely connected with economic benefits, it is unclear whether owner-occupied housing delivers better residential experience to its inhabitants.

**Figure 2. Homeownership Rate Change in Cities in China, 1979–2007**



Choice and Freedom in Housing Access: Prior to the housing policy reform, urban residents' housing access options were very limited. The majority of urban residents rented housing from their employer (i.e., the working unit) for a nominal monthly payment. These housing units were public housing likely constructed, owned, and maintained by working units or by a combination of working units and municipal governments. While they enjoyed housing as welfare benefits, residents living in these public rental housing had little freedom in their housing-related decisions because the housing allocation mechanism was based on one's administrative ranking, job seniority, and work performance, and was seldom connected with residents' housing needs and consumption capacity (Huang, 2006). For urban residents whose employer could not provide housing or who were not affiliated with any work unit, their housing attainment was through local municipal housing management bureau, through help from family members or friends, or through renting privately-owned housing. Similarly, these urban residents did not have freedom in choosing where to live and how much housing to consume.

More than 30 years after the beginning of housing-policy reform, China's urban housing now consists of housing obtained through a complex set of housing access options. Different access options afford varying levels of freedom and rationality in residents' housing-choice process. Whether a housing unit is accessed through market has implications for the level of freedom one can experience in his or her housing decision-making process.

Figure 3 summarizes several housing types based on the combination of housing sources, property rights, and housing attainment mechanism that co-exist in China's post-reform urban housing system (cited from Man et al., 2010). About 42% of urban housing in China was accessed through market-based transactions in 2007, which includes housing purchased (33%) and rented (9%) in the housing market. For urban residents, obtaining market housing is through voluntary residential mobility, and characterized by a more or less rational decision-making



process in that housing consumers choose housing that meet their housing needs and is within their resource limit. Several scholars point out that, although obtaining housing in the market offers choices, it is likely that only the high-income group can truly enjoy the freedom (Huang, 2003; 2006).

Among the housing not accessed through market-based transactions, the past welfare public housing units accounted for the largest proportion. The housing policy reform has pushed the privatization of those welfare housing. Starting from the mid-1990s, existing public housing stock was sold to their sitting tenants at a deeply discounted price, and this privatization process continued after 2000. By the year of 2007 about 42% of the housing stock was inherited from the legacy of the past welfare housing system, which includes privatized public housing (35%) and public housing still rented to residents (7%).

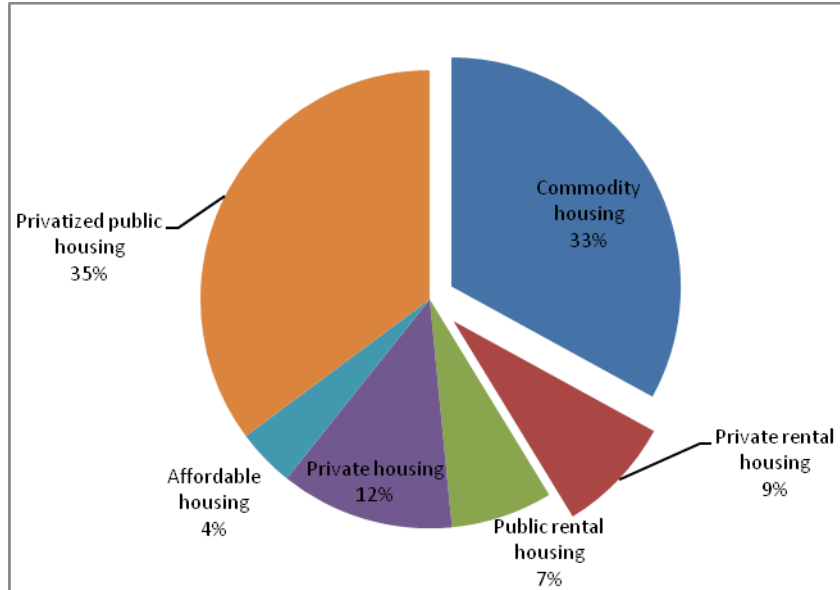
Acquiring affordable housing is considered quasi-market because these housing is built by real estate developed but is allocated through government programs. The main component of affordable housing until 2007 was Economic Housing (jingji shiyong zhufang), a homeownership-oriented housing program initiated nationwide in 1998. Developers of Economic Housing receive government subsidies, typically in forms of free land through administrative allocation and tax and fee reductions, and thus are required to sell these units to medium to low income residents at government-controlled prices. Many affordable housing projects are sited in locations where land price is inexpensive to reduce housing costs (Liu, 2007). While residents have the freedom of deciding whether acquiring affordable housing, their housing attainment process is characterized by very few choices in terms of location of housing and sizes of housing. While this type of housing was intended as low-cost and smaller housing to offer ownership to middle- to low-income urban residents, the policy implementation has not been effective (Han and Chai, 2009). There are also concerns that affordable housing is of inferior quality because of developers' desire to increase profits by using low-quality materials in construction (Liu, 2007). Affordable housing accounted for 4% of the urban housing stock nationally.

Another type quasi-market housing is also a component of government-subsidized affordable housing stock—Cheap Rental Housing (or, lianzu zhufang), a rental-oriented housing program adopted in 1995. However, the implementation had been very limited in the first decade after being adopted. Nationwide only 328 thousand families benefited from this program, among which 84.2% were covered through rent reduction (55.3%) or rent subsidy (28.9%), while only 14.4% received in-kind allocation of Cheap Rental Housing (Ministry of Construction, 2006).<sup>2</sup> The stock of Cheap Rental Housing only began sharp increase after 2007, when the government shifted its priority in affordable housing from promoting low-cost homeownership toward providing low-cost rental housing to low-income residents.

---

<sup>2</sup> Ministry of Construction. 2006. Report on Construction and Implementation of Cheap Rental Housing Program in Cities and Towns (MOC-Housing [2006] No.63). 关于城镇廉租住房制度建设和实施情况的通报 (建住房[2006]63号). Accessed February 21, 2011, from: [http://www.mohurd.gov.cn/zcfg/jswj/fdcy/200611/t20061101\\_157766.htm](http://www.mohurd.gov.cn/zcfg/jswj/fdcy/200611/t20061101_157766.htm).

**Figure 3. Urban Housing Type by Property Rights and Sources (2007)**



## **2.2 Lack of Subjective Assessment**

There is a very limited research on satisfaction for urban residents in China. While some studies have reported residents' subjective perceptions and satisfaction, they are mainly descriptive at reporting satisfaction levels or comparing them among population groups or toward various housing components. For example, Wu (2002) reported that migrants in general reported lower satisfaction levels compared with urban residents. Wong and Siu (1998) studied satisfaction for residents in newly-built housing projects in Guangzhou, and revealed that households generally were slightly more satisfied with their neighborhood than with their dwelling.

Currently there are no surveys conducted at national level that collect information specifically about residents' subjective perception and assessment of their residential environments. The Chinese Household Income Project (2002) included a module on subjective wellbeing. Data collected through this project has enabled scholars to study life satisfaction in China, to compare Chinese life satisfaction with other countries, and to investigate how overall life satisfaction is affected by satisfaction with various aspects of life (Appleton and Song, 2008). Housing satisfaction has been identified as one of the most important determinants of overall life satisfaction. Unfortunately the data did not provide information on specific factors affecting housing satisfaction.

In the following section, we provide a review of methods for housing satisfaction research.

### 3. Housing Satisfaction—Concepts, Research Methods, and Evidence

#### 3.1 Definition and a Conceptual Framework

##### Concepts and Definitions

In the US, studies of satisfaction has benefited from the progress made in research on subjective wellbeing and quality of life in the 1950s and from subsequent social indicator movement in the 1960s and 70s (Diener and Suh, 1997). Satisfaction is considered as a valid and effective instrument to assess one's quality of life and wellbeing, whether it is with one's life as a whole or with particular aspect of one's life (Marans, 2006). The general definition of satisfaction developed by Campbell, Converse, and Rodgers follows that one's subjective satisfaction with any given aspect of life reflects the gap between one's aspiration level and one's perceived situation, and one's overall satisfaction is often an cumulative result of satisfaction with various aspects of life with each of the aspects assigned a priority (weight) for their importance to one's overall quality of life (Inglehart, 1977).

Such conceptualization of satisfaction essentially treats satisfaction as a function of how much (and how good) one can acquire and how close his perceived situation is to his or her aspired-to level. This definition helps explain both the existence of a strong correlation between one's material wellbeing and his or her subjective satisfaction and the lack of absolute correspondence between the two. In discussing the basis of subjective wellbeing, Inglehart (1977) further suggests that the process via which one derives satisfaction is likely a voluntary, goal-seeking one and that one's aspired-to conditions are likely socially-constructed with roots in social norm and values and can change as one's material or perceive situations change (Inglehart, 1977).

In short, we consider that housing and residential satisfaction reflect the degree to which residential environment can meet the needs of its inhabitants and further the attainment of their goals (see Francescato, 2002).

##### Measures and Operationalization

Based on the aforementioned conceptualization, researchers suggest that when appropriately operationalized and measured, "satisfaction" can be used to make inferences about properties of places and to compare different settings (Francescato, 2002). Operationalization of residential satisfaction often takes the form of households' evaluation (ranking or rating) of their living condition, which is generally collected through survey instruments that ask residents what qualities they associate with a good housing environment, how they rate their residential environment, and/or the reasons for giving positive ratings (Brower, 1996). Generally the households are provided with a scalar measure (1 to 10, 0 to 4, for example) to express their satisfaction, with the two extremes representing least satisfied and completely satisfied respectively. The rating can be obtained for the residential environment as a whole or for specific features of the living environment. While most existing satisfaction studies are based on the researchers' own survey data, some researchers have used large national survey data such as the American Housing Survey (Cook, 1993; Spain, 1988; Lu, 1999; Varady, 1983; Dahmann, 1983) or National Survey of Black Americans (Scanlon, 1998) to perform satisfaction-related analyses.

## Empirical Evidence

The western research on residential satisfaction have identified several themes as affecting residential satisfaction: housing unit, quality of and access to community and neighborhood services, community and neighborhood social and physical environments, and household background characteristics (Lansing et al. 1970, Speare 1974, Speare et al 1974, Galster 1987).

## Housing Features

In the western countries, enforcement of building codes for public health and safety reasons has required minimum standards to be met for most of such housing attributes as housing (room) size, construction qualities, equipment and facilities, and density. Homeownership greatly correlates with these housing attributes that are important to residential satisfaction. Compared with renters, homeowners are found to have higher residential satisfaction as owner-occupied housing tend to be of single-family dwelling type, of larger size, located in lower-density neighborhoods of relatively higher (or more homogenous) socioeconomic status and with more open space (Rohe and Stegman, 1994). According to American Housing Survey (see national surveys 2005 and 2009), owner-occupied housing is more likely to have amenities such as porch, deck, fireplace, separate dining room, garage etc.

## Neighborhood Features

A comprehensive summary of neighborhood features that have had an impact on satisfaction (Sirgy and Cornwell, 2002) includes physical, social, and economic features. The physical features include upkeep of neighborhood properties and environment, landscape in the neighborhood, street lighting in the neighborhood, crowding and noise level, nearness of supporting facilities, and adequacy of outdoor play space. The social features include social interaction with neighbors, ties with people living in the neighborhood or community, crime, race relations in the community, and sense of privacy at home. Economic features associating with neighborhood satisfaction, finally, include neighborhood housing values, cost of living in the community, socio-economic status of neighborhood, and neighborhood improvement.

Empirical research has suggested that satisfaction with neighborhood is most strongly determined by the individual's perception of the neighborhood housing and maintenance; of the friendliness of their neighbors; of their security from criminals; and of the convenience to work and shopping (Campbell, 1981).

Summarizing previous research, Brower (1996) listed 33 neighborhood qualities that emerge from those surveys. While some of the qualities hold varying levels of appeal to different populations, the most salient and frequently mentioned characteristics of satisfying neighborhoods include privacy, safety, tranquility, compatible social interaction, and good accessibility (Brower, 1996). All these qualities are deemed essential for a good neighborhood environment from residents' view, but households place widely differing weights on the importance of these qualities. When households cannot find all the qualities at a single locality, they make trade-offs between locations to find the most satisfactory combination.

## Household Characteristics

Among the household background characteristics, some significant ones include socioeconomic status, tenure, life cycle stages, gender of householder, and length of residence; their effects are mediated, however, by housing and neighborhood conditions. Using American Housing Survey data, Varady's (1983) study revealed that household background characteristics (e.g., race and income) are determinants of the number and types of the housing and neighborhood problems they are likely to face, and thus they correlate with the level of satisfaction reported. Thus it is not surprising that most of the studies of residential satisfaction that consider the characteristics of respondent households have shown that low-income households, households headed by minorities, and single-parent headed households have lower satisfaction levels (Cook, 1993; Spain, 1988).

Different population groups have varied needs, preferences, and aspirations in their housing consumption and thus may be satisfied by differing neighborhood and housing elements and through different spatial arrangements or configurations. Galster's (1987) study confirmed that the impacts of housing characteristics (e.g., adequacy of interior space and yard size, and plumbing facilities) on homeowners' satisfaction are dependent upon household needs, highly variable across household strata, and nonlinear.

### **4. Research Design and Methodology—A Case Study of Beijing**

This paper addresses two main research questions: Does market-based housing consumption provide their residents higher satisfaction levels compared with other types of housing access options? Do different housing access options offer similar level of satisfaction for middle- to low-income households? To answer these questions we use a case study and employ statistical analysis based on a large-scale survey data.

#### **4.1 The Study Area: Beijing**

We use the city of Beijing as the object of our case study. Beijing is a fast-growing, dynamic metropolis in China with more than 19 million permanent residents (16.8 million living in urban districts of Beijing Municipality) and a floating population of over 7 million, according to the Sixth Population Census in 2010,<sup>3</sup> up from 15.4 million total populations and 12.8 million urban populations in 2005.<sup>4</sup> It is representative because it broadly covers low-, middle- and high-income groups. Within Beijing, high-income residents locate near the city center, which is similar to most European cities and a few older American cities (Zheng et al., 2006). These places are also featured with more amenities and attract a more educated population (Waldfoegel, 2006). Figures 4 show a map of Beijing's districts.

---

<sup>3</sup> [http://www.bjstats.gov.cn/rkpc\\_6/pcdt/pcxw/201105/t20110504\\_201365.htm](http://www.bjstats.gov.cn/rkpc_6/pcdt/pcxw/201105/t20110504_201365.htm)

<sup>4</sup> [http://www.cpdrc.org.cn/tjsj/tjsj\\_gb\\_detail1.asp?id=6674](http://www.cpdrc.org.cn/tjsj/tjsj_gb_detail1.asp?id=6674)

**Figure 4. Map of Districts in City of Beijing**



Note: Among the 8 urban districts, districts from number 1 to 4 are identified as the inner city districts and districts number 5 to 8 the middle city. The rest area is the outer city.

As the capital of China, Beijing is important in policy making and implementation (Wang, 2001). Transformation of the urban housing policy in Beijing largely resembled the incremental process of the national housing reform. Until the mid-1990s, housing reform agendas had been piecemeal, focusing on a series of experimental programs such as rent increase for public housing stock and private investment in real estate development. It was until the adoption of the 1994 national housing reform agendas that the housing system began systematic transition through privatization of public housing stock to sitting tenants (i.e. privatized public housing), and promotion of commodity housing development.

After 1998, in-kind welfare housing allocation from work units was officially prohibited and residents were expected to meet their housing needs through market mechanisms. Nevertheless, partly owing to mounted pressure from rapid housing price inflation since 2004, various forms of subsidized housing allocation from work units were acknowledged by affordable housing policy in Chinese cities such as Beijing, where many powerful central government agencies and state-owned enterprises are located.

The piecemeal housing reform in the last two decades has resulted in a complex ownership structure of the urban housing system in Beijing, which includes all the types of housing discussed earlier. Compared with the national statistics, Beijing has a relatively lower

homeownership rate and higher percentage of its housing stock belongs to past public housing (privatized or rental). The proportion of affordable housing stock is relatively higher in Beijing than in the rest of the country as Beijing has been a pilot city to implement affordable housing programs (Liu, 2007).

## 4.2 Data

We took advantage of a large-scale household survey data collected from City of Beijing in 2005. The data was collected for the purpose of studying conditions of livability in cities in China, and was from residents throughout 11 districts in Beijing (Dongcheng, Xicheng, Chongwen, Xuanwu, Haidian, Chaoyang, Shijingshan and Fengtai District, Tongzhou, Daxing and Changping).

The target population in this survey was regular residents living in the city of Beijing for at least six months. It was assumed that only residents who had lived in Beijing for a long time were familiar enough with their residential environments to formulate good evaluations. Several sampling strategies were used (systematic random sampling, convenience sampling, population density based sampling, and cross-control quota sampling gender and age) to identify about 11,000 sample households. Eventually 7647 households participated in the survey, resulting in approximately 6330 valid cases. Zhang et al. (2006) reported that the sample was representative of the overall population of Beijing residents.

## 4.3 Concepts, Variables, and Descriptive Statistics

### Measuring Residential Satisfaction

The survey asked respondents to report their satisfaction toward housing unit. The question simply asked whether a respondent was somewhat satisfied with their housing unit. This variable is coded as a dummy variable indicating yes (satisfied) or no (not satisfied). Among all valid sample cases (N=6330), 55.1% reported somewhat satisfied with their housing condition.

### Types of Housing Access

We identified four types of housing access from the survey data based on the level of freedom in housing access (see Table 2):

**Table 2. Types of Housing Access Identified in the Survey Data**

Type of housing access		Freedom in Housing Access	Percentage (N=6331)
<b>Market Housing</b>	Housing purchased and rented through the market (new housing and second-hand housing)	Choice over where and what type of housing	31.5%
Housing rented or purchased through market, including housing stock (new and second-hand)			

produced by private developers, and originally privatized public housing stock now available for transactions in market			
<b>Quasi-market Affordable Housing</b> Housing largely produced by private developers with public subsidies and sold at discounted prices	Housing purchased at a subsidized price (Jingji Shiyong Zhufang)	limited choice over housing location	11.3%
<b>Non-market Housing</b> Housing produced and allocated through past socialist housing system, continued to be occupied (owned or rented) by sitting residents. New public housing (Cheap renter housing)	Public housing sold to sitting residents; Public housing still rented to original residents it was allocated to.	Little choice over where to live and what type of housing	50.9%
<b>Replacement Housing</b> Housing produced by private developers, sold to people displaced by inner-city redevelopment programs or rural land acquisition by city government at discounted prices	Replacement housing for displaced households due to urban expansion and redevelopment	Little choice, oftentimes involve involuntary move	6.3%

Similar to the housing attainment options discussed earlier, housing access types present in City of Beijing include market housing, quasi-market housing (affordable housing), and non-market housing (privatized and rented public housing). A fourth type of housing access is added to the list—replacement housing. This housing includes units that were sold or offered to residents who had been displaced by various urban (re)development projects. While they obtained the on-site or off-site replacement housing as compensation for their rural housing or urban housing, these relocated residents often had little choice over where the replacement housing sites could be located. Studies also revealed adverse psychological impacts of the replacement process on urban residents displaced from tightly knitted old urban neighborhoods. Compared with other three types of housing access, the replacement housing offers the least freedom and may involve involuntary move.



## Control Variables

Informed by research on residential satisfaction, we consider in our analysis other variables that have important impacts on housing satisfaction.

### *Housing Characteristics*

Variables characterizing housing conditions include size of unit and housing tenure type (owner vs. renter) (Table 3). Housing size is classified into four types following typically used thresholds. Since information about interior housing facilities was not collected in this survey, we used housing size categories as a proxy for housing functional completeness, believing that larger housing units tend to have complete housing room functions and better interior facilities.

**Table 3. Information about Housing Characteristics Collected in the Survey**

Variable	Frequency	Percent
Square footage per unit		
Small ( $\leq 50$ sq. m)	1,190	18.94%
Medium (51-89 sq. m)	3281	52.23%
Med-large (90 -119 sq. m)	1226	19.52%
Large ( $\geq 120$ sq. m)	584	9.30%
Ownership		
Renter	1,639	25.9%
Owner	4,692	74.1%
Location		
Inner city	1,586	25.07%
Middle city	4,137	65.41%
Outer city	602	9.52%

We also include housing location characterized as inner city zone (4 districts including: Dongcheng, Xicheng, Chongwen, Xuanwu), middle city zone (4 districts: Haidian, Chaoyang, Shijingshan and Fengtai District), and outer city zone (three districts: Tongzhou, Daxing and Changping District) in Beijing (see Figure 4).

### *Household Characteristics*

Variables characterizing a household include a respondent's background characteristics (age, gender, education, administrative ranking, and occupation), household size and income, and the year when a household moved into their housing unit (Table 4).

**Table 4. Descriptive Statistics for Household Variables**

Variable	Frequency	Percent
<b>Age</b>		
Below 30	2,750	43.48%
30-39	1,431	22.62%
40-49	1,427	22.56%
50-59	572	9.04%
Above 60	145	2.29%
Total	6,325	100%
<b>Gender</b>		
Female	3,197	50.56%
Male	3,127	49.44%
Total	6,324	
<b>Education</b>		
Middle school or lower	501	7.92%
High school	1,704	26.94%
Undergraduate	3,760	59.45%
Graduate	360	5.69%
Total	6,325	100%
<b>Monthly income</b>		
Low (<3,000yuan)	1,697	26.83%
Medium low (3,000-4,999yuan)	2,389	37.78%
Medium high (5,000-10,000yuan)	1,750	27.66%
High (>10,000yuan)	489	7.73%
Total	6,325	100%
<b>Moved-in year</b>		
Pre-1995	3,609	57.07%
1995-2000	650	10.28%
Post-2000 (2000-2005)	2,066	32.66%
Total	6,326	
<b>Household size</b>		
Range (1 to 5)	Avg: 2.61	

## 5. Findings

### Satisfaction across Housing Types

We use mean comparison to study the discrepancy in housing satisfaction across four types of housing access. Table 5 shows that respondents who acquired housing through market were more likely to be satisfied with their housing compared with residents from other type of housing—close to two thirds (65.5%) of the market-housing residents reported satisfaction with their housing. Among the four types of housing, residents from the past public housing units were on

average least likely to be satisfied with their housing unit condition—only slightly more than half (51.5%) reported so.

But a closer look at housing by tenure suggests that rental housing in the market did not necessarily provided more satisfactory housing to residents compared with rental housing obtained through the public housing system. Renters who had access housing through the two avenues were of similarly likelihood of being satisfied with their housing condition—less than 50% of renters from these two groups reported so.

**Table 5. Percentage of Residents Reporting Satisfied with Housing by Housing Access Type and Tenure**

	Owner		Renter		Overall	
	% satisfied	N	% satisfied	N	% satisfied	N
Market	65.5%	1430	48.8%	562	60.8%	1992
Affordable	55.6%	717	n/a	-	55.6%	717
Non-market	52.5%	2145	48.7%	1077	51.2%	3222
Replacement	57.2%	397	n/a	-	57.2%	397
overall	57.4%	4689	48.7%	1639	55.1%	6328

Independent Effects of Housing Access on Housing Satisfaction

The greater likelihood of market-housing residents reporting satisfaction with housing may have been resulting from the fact that market housing is generally newer and of better quality. To test the independent effects of housing type on housing satisfaction, we conduct a logistic regression analysis with the following functional form:

$$SAT\_housing = F(\text{housing size; housing tenure; household income; respondent occupation, age, education, and gender; year moved-in; housing location, housing access type})$$

Table 6 reports outcome from the logistic regression. Some variables that are usually associated with housing satisfaction in the western literature show statistically significant effects in our analysis with the Beijing survey sample. Higher income is associated with higher level of satisfaction with housing unit. The probability of being satisfied with one’s housing unit increased by a factor 1.19 when household income increase from low-income category (monthly salary < 3000 RMB) to medium-low income (monthly salary, 3000 ~ 4999 RMB), the factor is 1.80 from low-income to medium-high income and 2.47 from low-income to high-income. There are clear, positive effects of housing size on housing unit satisfaction. When all things are equal people who lived in larger housing size were more likely to be satisfied with their housing.

Home ownership is often reported in western literature as exhibiting positive effects on housing satisfaction. But this housing characteristic did not register significant effects on neither housing unit satisfaction nor residential satisfaction. Close to half (45.7%) of the homeowners in this sample were residents who obtained housing ownership simply by purchasing public housing they used to live in. Thus for many residents in our sample housing ownership didn’t necessarily bring to them better housing and residential environmental conditions. Our subsequent analyses

examined housing access separately, and showed that ownership was not a significant predictor for housing satisfaction even for households who obtained housing ownership through market.

A respondent's administrative ranking, a characteristic unique to housing consumption in China, had effects on housing unit satisfaction. With everything else being equal, residents of higher administrative ranking were more likely to report satisfaction with their housing than respondents of lower ranking status. This finding is consistent with studies by other scholars (e.g., Huang 2003). The positive relationship between housing consumption and residents' administrative ranking was strong in the past welfare housing system. This relationship is still discernible 30 years after housing policy reform had started as the housing stock in our sample is still dominated by housing produced and allocated in the welfare housing era. Our further analysis not reported here shows that administrative ranking's effects are only significant for residents living in past public housing, suggesting this factor no longer has substantial impacts on housing consumption in the market-based allocation system where income becomes a more important determinant of housing consumption.

Residents living closer to inner city districts express higher satisfaction with their housing units, which is consistent with a study by Zheng and Khan (2006) showing that housing stock in Beijing's inner city districts have been mainly for higher-income residents. People who lived in their residence for longer time (e.g., moved in pre-95 vs. moved in after) were more likely to be satisfied with their housing unit and reported higher satisfaction toward their residential environment. This finding is consistent with evidence from western literature that long-term residents are more likely to be satisfied with their housing (Parkes, 2002).

After all things being controlled for, residents of market housing were more likely to be satisfied with their housing units than two types of non-market housing residents—residents from public housing and affordable housing. But there is no statistically significant difference in housing unit satisfaction between market-housing residents and replacement-housing residents.

**Table 6. Logistic Model Predicting Satisfaction with Housing Unit**

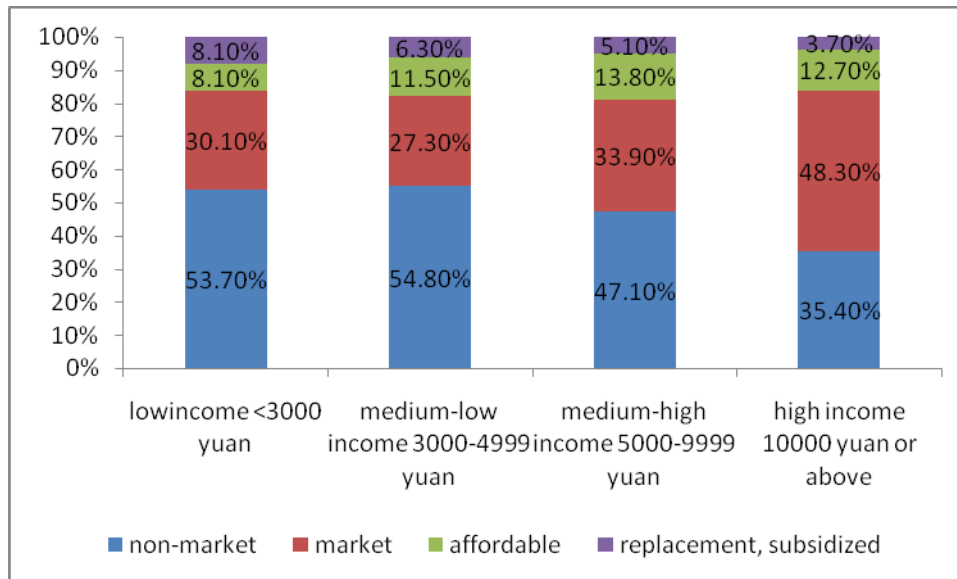
	B	S.E.	Sig.		Exp(B)
Constant	-.431	.198	.029		.650
nonmarket	-.207	.070	.003	**	.813
affordableh	-.316	.098	.001	**	.729
replacementh	.071	.125	.568		1.074
tenure	.078	.071	.271		1.081
hhinc_mediumlow	.171	.073	.019		1.186
hhinc_mediumhigh	.588	.084	.000	***	1.800
hhinc_high	.902	.134	.000	***	2.466
hmid	.296	.128	.021	**	1.344
hmidb	.589	.129	.000	***	1.801
hbig	.872	.145	.000	***	2.391
hlarge	1.164	.182	.000	***	3.203
edu_highschool	.090	.120	.451		1.095

edu_undergraduate	.116	.120	.336		1.123
edu_graduate	.241	.172	.162		1.272
age30_39	.077	.075	.304		1.080
age40_49	-.095	.081	.243		.910
age50_59	-.118	.113	.297		.889
age60_	.067	.230	.770		1.070
malegender	.112	.057	.048	*	1.119
sizeoffamily	-.099	.032	.002	**	.905
position_midlevel	.214	.070	.002	***	1.238
position_highlevel	.354	.093	.000	***	1.425
occp_professional	-.143	.103	.167		.867
occp_fireht	-.212	.114	.061	*	.809
occp_industrial	-.296	.103	.004	**	.744
occp_lservice	-.111	.125	.375		.895
occp_othservice	-.316	.107	.003	***	.729
mid_ring	.077	.067	.250		1.080
out_ring	-.294	.110	<b>.008</b>	***	.745
pre95	.155	.067	.020	**	1.168
between95_00	-.065	.101	.524		.937
	N = 5710				
	“-2 Log likelihood = 7425.9”				
	Nagelkerke R-sq = 0.096				

### The Effects of Housing Access on Housing Satisfaction by Income Groups

Households from different income groups had relied on different housing sources to acquire housing. The majority of the households in the two low-income groups had acquired their housing through non-market housing. For the lowest-income group, while more than 30% of them accessed their housing in the market, only slightly more than 50% owned their market-housing. The other income groups who acquired market-housing had much higher homeownership rates. They were 70.4%, 84.5%, and 87.7% for the medium-low, medium-high, and high-income groups, respectively (see Figure 5).

**Figure 5. Makeup of Housing Access Types for Four Income Population Groups**



The high-income households had the largest proportion (48.3%) who obtained their housing through the housing market. They were least likely to live in replacement housing, compared with the other income groups.

Access to affordable housing didn't appear to correlate in a predictable way with household income, consistent with some scholars' observation that affordable housing programs in Beijing had not adopted consistent income criteria in their implementation (Yi and Huang, 2011).

To test whether different types of housing access would have varying effects on housing satisfaction for population groups from different income levels, and whether important housing characteristics would exhibit different effects on housing satisfaction for different income groups, we conducted a series of logistic regression analysis using sub-samples stratified by four income groups. The functional form of these regressions is identical to the full-sample model except that household income variables were excluded. Table 7 reports regression output.<sup>5</sup>

The effects of housing access type on housing satisfaction vary by income groups. Compared with market-housing, affordable housing had negative effects on housing satisfaction for all income groups, although the effects were statistically significant only for the two low-income groups. It is interesting to note that the size of the affordable housing variable's coefficient was the largest for the lowest-income group, suggesting that the very low-income residents who lived in affordable housing program were less likely to be satisfied with their housing, compared with their counterparts in all other types of housing they could acquire. Ironically, the affordable housing was intended to provide accessible housing for this particular group.

Housing acquired through public housing system had negative effects for all income groups, and were statistically significant for the two middle-income groups. The negative effect of housing

<sup>5</sup> Table 7 is in appendix.

from past public housing system was the strongest for households earning moderate-high income (5000 to 1000 RMB per month), compared with that for the other three income groups, suggesting the fact that this type of housing had particular strong negative effects on housing satisfaction for the moderate-high income residents.

Replacement housing had mixed effects—for households in the moderate-low income level, this housing type had positive and statistically significant effects on housing satisfaction. But for other income groups, the coefficients associated with the replacement housing variable were negative and statistically insignificant. It is interesting to note that the

Overall, there were no statistically significant effects on housing satisfaction associated with housing access types for households in the highest income category.

The positive effects of housing size on housing satisfaction remain strong for all income groups except for the highest one. The effects of homeownership on housing satisfaction were mixed—for moderate low income group, the effects were positive suggesting homeowners were more likely to be satisfied with their housing than renters. But for the highest-income group, the effects were negative. Homeownership didn't exhibit statistically significant effects on housing satisfaction for the other two income groups. It appears that as income rises, the effects of homeownership turned into negative.

The household background characteristics in general exhibited weak effects on housing satisfaction after the characteristics of housing have been controlled for. The positive effects of educational achievement, administrative ranking, and residence length were evident for the moderate-high income group. For the highest-income group, only two household variables exhibit statistically significant effects on the dependent variable—male respondents and residents of longer time were more likely to be satisfied with their housing.

## **6. Discussion and Policy Implication**

This paper uses a large sample data to examine how different housing access options could impact on residents' housing satisfaction when important housing characteristics and household characteristics can be held constant. While this is the largest survey data available to study housing satisfaction and to explore its determinants, our analysis was limited due to limitations with the data set. One particular issue was the lack of information collected about housing construction and design (layout) quality. Nevertheless, the findings from our analysis suggest several points.

First, a housing unit accessed in the market was more likely be satisfactory to its residents, compared with a unit that was obtained through all other housing access, was of same size and tenure type, and had residents comparable in terms of their socioeconomic status and residential location and residence length. This appears true for households from almost every income group except for residents from the moderate-low income group. While it is likely that housing acquired through the market tend to be those developed by private developers for profit and are newer and better designed, we argue that these findings lend some support for our belief that the

freedom associated with accessing housing through the market could increase the chance for household to acquire a satisfactory housing unit.

Second, for residents from the two low-income groups, it is interesting to see the affordable housing, usually offered at a lower cost compared with commercial housing, was not more likely to be considered as satisfactory than market-housing. Inferior housing construction quality, a problem that had plagued those cheaply-built affordable housing stock had likely played a role here. This finding may also indicate that relying on market to allocate housing may be more effective at meeting low-income households' housing needs than providing housing through current affordable housing programs because the market may offer more choices in location and size of housing units to them.

But of course we need to be aware that housing opportunities available to this group of households in the housing market is also very limited. Since a large portion of the low-income residents had to rely on private rental housing in the market to meet their housing needs, offering housing voucher to low income urban residents can increase their capacity to acquire better and larger housing in the market. This may be an alternative policy to the affordable housing programs aimed at addressing the housing consumption discrepancy among households from different income groups.

Finally, our research shows residents who owned their home was not necessarily more likely to be satisfied with their housing than renters when the two types of housing were of similar characteristic. The cost of attaining homeownership is becoming increasingly high, yet there is little evidence showing that homeownership on average is clearly associated with greater housing satisfaction. It appears that homeownership has become an investment tool, and the rise in homeownership rates is more a result of speculative market behavior than reflection of seeking improvement in quality of life.

In summary, our research provides some evidence showing that housing allocation mechanism by housing market benefits most urban households including the low-income residents. Of course our research here has been limited to satisfaction toward a resident's housing unit per se. As housing expands to include a bundle of services which include unit, service, and amenities, a better understanding of the impacts of housing policy impact on urban residents' housing consumption should residents' satisfaction toward their neighborhood environments.



## References

- Appleton, S. & Song, L. 2008. Life Satisfaction in Urban China: Components and Determinants. *World Development Vol. 36*, No. 11: 2325–2340
- Beijing Commodity Housing Report*. 2007. Stanley & Partners Real Estate Investment Banking Services.
- Beijing municipal government*. Beijing Urban Planning from 2004 to 2020 (in Chinese). Retrieved from <http://www.drcnet.com.cn/>.
- Beijing Real Estate Trade Organization. Retrieved from: <http://www.bjfdc.gov.cn/>.
- Bian, Y., Logan, J. R., Hanlong, L., Yunkang, P. & Ying, G. 1997 Working units and the commodification of housing: observations on the transition to a market economy with Chinese characteristics. *Social Sciences in China, XVIII*:28–35.
- Campbell, A., Converse, P., Rodgers, W. 1976. The Quality of American Life: Perceptions, Evaluations and Satisfactions. *Russell Sage Foundation*, New York.
- Chen, K. 2003. “Urban Housing Quality in China: A Post-occupancy Evaluation Study of Stat Pilot Housing Estates,” *Journal of Architectural and Planning Research*.
- China Statistical Yearbook 2008*. State Statistical Bureau of the People's Republic of China. China Statistics Press.
- Diener, E & Suh, E. 1997. Measuring Quality of Life: Economic, Social, and Subjective Indicators. *Social Indicators Research 40*: 189–216.
- Dwyer D., 1986. Urban Housing and Planning in China. *Transactions of the Institute of British Geographers, New Series, Vol. 11*, No. 4: 479–489.
- Fang, Y. 2005. Residential Satisfaction Conceptual Framework Revisited—A Study on Redeveloped Neighborhoods in Inner City Beijing. Retrieved from: <http://mumford.albany.edu/chinanet/hongkong2004/fangyiping.doc>.
- Feng, W. 2003. Housing Improvement and Distribution in Urban China: Initial Evidence from China's 2000 Census. *The China Review, 3*(2), 121–143.
- Francescato, G. 2002. Residential satisfaction research: The case for and against. In J. I. Aragonés, G. Francescato, & T. Garling (Eds.), *Residential environments: Choice, satisfaction, and behavior* (pp. 15–34). Westport, CT: Bergin & Garvey.
- Galster, G., & Hesser, G. 1981. Residential satisfaction: Compositional and contextual correlates. *Environment and Behavior, 13* (6), 735–758.
- Han, L. & Chai, F. 2009. The affordable housing in China: discussion of development, questions and solutions of Chinese affordable housing (in Chinese). *Xinan University transactions, Vol. 219*.

- Huang, Y. & Clark, W. 2002. Housing Tenure Choice in Transitional Urban China: A Multilevel Analysis. *Urban Studies*, Vol. 39, No. 1, 7–32.
- Huang, Y. 2003a. Renters' Housing Behaviour in Transitional Urban China. *Housing Studies*, Vol. 18, No. 1, 103–126, 2003.
- Huang, Y. 2003b. A room of one's own: housing consumption and residential crowding in transitional urban China. *Environment and Planning A 2003*, volume 35:591–614.
- Huang, Y. & Yi, C. 2011. Second Home Ownership in Transitional Urban China. *Housing Studies*, Vol. 26 No. 3. 1466–1810.
- Inglehart, R. 1977. The silent Revolution, Changing values and Political Styles among Western Publics. Princeton: Princeton University Press.
- Jiang, L. 2006. Living Conditions of the Floating Population in Urban China. *Housing Studies*, Vol. 21, No. 5, 719–744, September.
- Lee, J. 2000. From Welfare Housing to Home Ownership: The Dilemma of China's Housing Reform. *Housing Studies*, Vol. 15, No. 1:61–76,
- Li & Huang. 2006. Urban Housing in China: Market Transition, Housing Mobility and Neighborhood Change. *Housing Studies*, Vol. 21, No. 5:613–623.
- Logan, J & Bian, Y. 1993. Inequalities in Access to Community Resources in a Chinese City. *Social Forces*. Vol. 72, No. 2 (Dec., 1993):555–576.
- Marans, R. & Rodgers, W. 1975. Toward an understanding of community satisfaction. Metropolitan America in Contemporary Perspective. Edited by Amos H. Hawley and Vincent P. Rock. New York: Wiley:299–352.
- Marans, R. 2003. Understanding environmental quality through quality of life studies: the 2001 DAS and its use of subjective and objective indicators. *Landscape and Urban Planning* 65:73–83.
- Oniboken, A.G. 1976. Social system correlates of residential satisfaction. *Environment and Behavior* 8(3): 323–344.
- Parsons, G. R. 1986. An Almost Ideal Demand System for Housing Attributes. *Southern Economic Journal*, Vol. 53, No. 2:347–363.
- Rohe and Stegman. 1994. The effects of homeownership on self-esteem, perceived control and life satisfaction of low-income people. *Journal of the American Planning Association* 60(2): 173–184.
- Wang & Murie, 1999. *Housing Policy and Practice in China*. New York: St. Martin's Press, ISBN 0-333-68253-x.
- Wang & Murie, 2000a. Housing Reform and its Impacts on the Urban Poor in China. *Housing Studies*, Vol. 15, No. 6, 845–864, 2000.

- Wang & Murie, 2000b. Social and Spatial Implications of Housing Reform in China. *International Journal of Urban and Regional Research*. Volume 24.2 June 2000.
- Wang, Y. 2000. Housing Reform and its Impacts on the Urban Poor in China. *Housing Studies*, Vol. 15, No. 6, 845–864
- Wang, Y. 2001. Urban housing reform and finance in China: A case study of Beijing. *Urban Affairs Review* 2001; 36; 620 DOI: 10.1177/10780870122185028.
- Wang, Y. 2004. *Urban Poverty, Housing and Social Change in China*. Routledge.
- Wong, K. & Siu W M. 1998. *Analysis of the results of a survey on residential and neighbourhood satisfaction of residents of commodity housing in Guangzhou*. [Proceedings of the Second Conference on China's Economic Reform and Social Development] Eds Z Yu, M Zhang (Tsinghua University Press, Beijing):309–320.
- Wu, F. 2004. Residential relocation under market-oriented redevelopment: the process and outcomes in urban China. *Geoforum* 35:453–470.
- Wu, W. 2004. Sources of migrant housing disadvantage in urban China. *Environment and Planning A*, volume 36, pages 1285–1304.
- Yang, Y. 2008. A Tale of Two Cities: Physical Form and Neighborhood Satisfaction in Metropolitan Portland and Charlotte. *Journal of the American Planning Association*, 74: 3, 307 — 323. Yang, Z. & Shen, Y. The affordability of owner occupied housing in Beijing. *J Hous and the Built Environ* 23:317–335.
- Ye, J. n.a. China Housing Policy and Housing Market. Retrieved from:  
[http://www.prres.net/Papers/Ye\\_China\\_Housing\\_Policy\\_and\\_Housing\\_Market.pdf](http://www.prres.net/Papers/Ye_China_Housing_Policy_and_Housing_Market.pdf).
- Zheng, S. & Kahn, M. E. (2008). Land and residential property markets in a booming economy: New evidence from Beijing. *Journal of Urban Economics* 63: 743–757.
- Zheng, S.Q., Fu, Y.M. & Liu, H.Y. 2006. Housing-choice hindrances and urban spatial structure: Evidence from matched location and location-preference data in Chinese cities. *Journal of Urban Economics* 60 (3):535–557.
- Zhu, Y. 2007. *Housing reform in China: policy innovation and housing equality*. ZhongShan University Press. ISBN: 9787306028488.

## Appendix

**Table 1. History of Housing Policy Reform and Its Impacts on Various of Housing Provision**

	Pre-Reform		Experimental Reform	Nation-wide Reform	Deepening Reform
	1949-1966	1967-1978	1979-1985	1985-1998	1998-today
Housing investment	State planned investment (<10% infrastructure investment)	State planned investment (2%-6% infrastructure investment)	State planned investment (~20% infrastructure investment)  Investment from local governments, work units, individuals	State planned investment (10%-15% infrastructure investment) Work units, local governments, public agencies and private companies investment;	State planned investment Investment from developers.
Constructing organization	Work units, local governments (seldom)	Work units, local governments (seldom)	Work units, local governments and work units, local governments	Local governments and work units, local governments, public agencies and private companies, work unites	Local governments, local governments, public agencies and private companies, work unites
Construction standard	Learn from Soviet Union, community development (failed)		Standard housing (42-50 sq. meters, more floors); attention to community design and public facilities	Standard housing (more living space, attention to functional designs);	Standard housing (more living space, attention to functional designs);
Product	Tube-shaped apartment, cottage, flat (unit: room). Public housing	Tube-shaped apartment, cottage, flat (unit: room). Public housing	Multi-storey dwelling (5-7/ unit: suite) Public housing, pre-owned housing	Multiple housing styles (separate house, town house, multi-storey dwelling). Public housing, pre-owned housing, commercial housing	Multiple housing styles (separate house, town house, multi-storey dwelling). Public housing, private housing, affordable housing, etc.
Management	Work unit. Low rent (anticipate: 6%-10%income, in fact: <5%income)	Work unit. Low rent (1%-3%income)	Local housing bureau, work unit. Low rent (<5%income)	Professional property management company (state owned or private), local housing bureau, work unit. Low rent with rent reform	Professional property management company (state owned or private), local housing bureau, work unit

Allocation	Allocation followed government guideline (senior range). internal allocation in work unit (need and contribution)	Allocation followed government guideline (senior range). internal allocation in work unit (need and contribution)	Internal allocation in work unit. Purchase new housing by work unit and then allocate them to employees. Allocation using market price	Internal allocation in work unit. Purchase new housing by work unit and then allocate them to employees. Allocation using market price	Allocation using market price
------------	--	--	--	--	-------------------------------

**Table 7. Model output from Stratigied Logistic Models**

	very low-income					moderate-low income					moderate-high income					high-income			
	Income: <3000 RMB					Income: 3000 ~ 5000					Income: 5000 ~ 10000					Income: >10000			
	B	S.E.	Sig.	Exp(B)		B	S.E.	Sig.	Exp(B)		B	S.E.	Sig.	Exp(B)		B	S.E.	Sig.	Exp(B)
nonmarket	-.01	.14		.99		-.28	.11	**	.76		-.35	.13	**	.71		-.05	.29		.96
affordableh	-.70	.23	***	.50		-.26	.16	*	.77		-.17	.18		.85		-.36	.37		.70
replacementh	-.06	.23		.94		.40	.21	*	1.49		-.27	.26		.77		-.22	.61		.81
tenure	.02	.13		1.02		.24	.11	**	1.27		-.03	.15		.97		-.76	.39	*	.47
hmid	.07	.18		1.08		.58	.23	**	1.79		.29	.38		1.34		.60	1.06		1.82
hmidb	.57	.19	***	1.76		.78	.23	***	2.18		.58	.38		1.79		.61	1.04		1.83
hbig	1.06	.24	***	2.87		.85	.25	***	2.35		.82	.40	**	2.26		1.45	1.06		4.25
hlarge	1.71	.39	***	5.54		1.12	.32	***	3.06		1.32	.45	***	3.73		1.24	1.08		3.45
edu_highschool	-.19	.17		.83		.16	.22		1.18		1.09	.35	***	2.97		-.56	.96		.57
edu_undergraduate	-.12	.18		.89		.10	.22		1.10		1.10	.33	***	3.00		-.38	.93		.69
edu_graduate	-.35	.45		.71		.48	.32		1.62		1.23	.38	***	3.42		-.33	.98		.72
age30_39	.13	.18		1.14		-.06	.12		.94		.25	.13	*	1.28		.47	.30		1.60
age40_49	-.20	.17		.82		-.20	.13		.82		.11	.16		1.11		.41	.34		1.51
age50_59	-.40	.21	*	.67		-.41	.19	**	.66		.70	.24	***	2.01		-.04	.51		.96
age60_	-.02	.38		.98		.02	.41		1.02		.56	.52		1.76		-.50	.81		.61
q25malegender	.11	.11		1.12		.11	.09		1.11		.01	.11		1.01		.47	.24	*	1.60
q26sizeoffamily	-.14	.06	**	.87		-.07	.05		.94		-.10	.06		.90		-.18	.13		.84
position_midlevel	.35	.18	*	1.41		.40	.11	***	1.49		-.03	.12		.97		.06	.30		1.06
position_highlevel	.20	.19		1.22		.42	.16	***	1.53		.30	.18	*	1.35		.41	.35		1.51
occp_professional	-.24	.23		.79		-.01	.16		.99		-.16	.19		.86		-.25	.46		.78
occp_fireht	-.35	.26		.71		-.12	.19		.89		.00	.21		1.00		-.57	.46		.56
occp_industrial	-.61	.20	***	.55		-.15	.16		.86		-.18	.21		.83		-.10	.52		.90
occp_lservice	-.46	.23	**	.63		.24	.20		1.27		-.36	.25		.69		1.15	.85		3.15
occp_othservice	-.57	.20	***	.57		-.13	.18		.88		-.21	.22		.81		-.62	.48		.54
mid_ring	.01	.14		1.01		-.07	.10		.94		.38	.13	***	1.46		-.13	.30		.88

out_ring	-.24	.21		.79		-.64	.18	***	.53		-.18	.23		.84		.82	.57		2.28
pre95	.15	.14		1.16		.04	.11		1.04		.23	.13	**	1.26		.58	.28	**	1.79
between95_00	.05	.21		1.05		-.20	.17		.82		-.02	.19		.98		-.11	.39		.90
Constant	.20	.33		1.23		-.56	.36		.57		-.94	.55	*	.39		1.31	1.52		3.72
	N=1701					N=2391					N=1750					N=489			
“-2 Log likelihood =	1939.6					2887					2004.8					462.2			
Nagelkerke R-sq =	0.092					0.064					0.07					0.131			