

# Housing Tenure Choice in Transitional Urban China: A Multilevel Analysis

Youqin Huang and William A. V. Clark

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**Summary.** Using a 1996 national survey of housing in China and a multilevel modelling technique, we examine housing tenure choice in transitional urban China where households have been granted limited freedom of choice in the housing market since the housing reforms of 1988. We find that both market mechanisms and institutional forces affect households' tenure choice in urban China. While some socioeconomic factors such as age, household size, household income and housing price have similar effects on tenure choice as in the West, others such as the number of workers and marital status have rather different effects. In addition, factors characterising institutional relationships among the state, work units and households, such as *hukou*, job rank and work unit rank, still play important roles in tenure choice.

Since the 1980s, most socialist economies have been in a process of transition and studies of transitional economies have become major topics in economics, geography, sociology and political science. Compared with the 'shock therapy' in eastern European countries and the USSR, the transition in China has been gradual and evolutionary (McMillan and Naughton, 1996). As part of the transition to a market economy, housing reform in urban China was launched nationwide in 1988. It aims to introduce market mechanisms to a heavily subsidised housing system and to transform housing from a welfare good to a commodity. To ensure a smooth transition, a dual system with 'new policies for the new housing stock, old meth-

ods for the old housing stock' (*xin fang xin zhi du, lao fang lao bai fa*) has been central to housing policies (State Council, 1998). While a housing market is emerging, the socialist forces in the housing system—such as the housing subsidies by work units—persist. It is this side-by-side combination of market mechanisms and institutional forces that creates the transitional nature of China's current housing system and sets a unique context within which households make tenure choices.

Urban households in China, who had few housing choices but to wait for subsidised rental housing (also 'public housing', *gong fang*) in the socialist era, now have choices regarding both housing type and

*Youqin Huang is in the Department of Geography and Urban Planning, State University of New York, Albany, NY 12222, USA. Fax: 518 442 4742. E-mail: yhuang@albany.edu. William A. V. Clark is in the Department of Geography, University of California, Los Angeles, 1255 Bunche Hall, 405 Hilgard Avenue, Los Angeles, CA 90095-1524, USA. Fax: 310 206 5976. E-mail: wclark@geog.ucla.edu. The authors are very grateful to Donald Treiman who provided them with the national survey data-set. They also wish to thank Cindy Fan for her comments and anonymous referees for their suggestions.*

tenure.<sup>1</sup> On the one hand, sitting tenants of public housing are given the option of either paying an increased rent or buying their current flats at subsidised prices (Tolley, 1991), a choice which provides residents an opportunity to own a flat and was largely impossible before housing reform. On the other hand, the newly built private housing by developers—called ‘commodity housing’ (*shang ping fang*)—and housing financed by households themselves mainly for owner-occupancy—‘self-built housing’ (*zi jian fang* or *ji zi jian fang*) (Zhang, 1998)—are becoming more and more popular housing options, especially for those who currently have no access to subsidised housing. Given the increased freedom of housing choice, it is important to understand how households behave in the transitional housing system.

With some important exceptions (Li, 2000a, 2000b), most existing research studies macro aspects of the housing system in China, such as housing provision (for example, Tolley, 1991; Wu, 1996; Zax, 1997), housing problems (for example, Zhang, 1998; Logan and Bian, 1993; Zhou and Logan, 1996) and housing policies (for example, Lee, 1988; Chen and Gao, 1993), and there has been much less research at the microlevel. The research reported in this paper provides an interpretation of individual behaviour in the housing market and the way in which tenure choices in a transitional housing system are mediated by both socio-economic factors and institutional forces. Since most urban households in China are sitting tenants of public housing who are for the first time being given the choices of renting or owning, this paper focuses on the tenure choice (own versus rent) as the first step to understanding individual behaviour in the transitional housing system, leaving choice of different types of home-ownership and rental for future investigation and analysis. After a brief literature review of tenure choice in general, the paper evaluates the nature of the housing system in transitional urban China and uses a multilevel analysis to evaluate the relative role of the factors affecting tenure choice.

## Literature Review and the Research Context

Two different approaches to tenure choice in market economies have evolved. The economic perspective assumes that households are economically rational and choose a certain type of tenure to maximise utilities within a given budget constraint (Arnott, 1987). In this approach, home-ownership is not just a consumption decision by households, but is also an investment decision in competitive housing markets. Income, assets and relative prices are considered as the most important factors affecting tenure changes (Henderson and Ioannides, 1983, 1985, 1987, 1989; Plaut, 1987). In general, home-ownership increases with household income. Demographic factors are considered to affect tenure choice through changing socioeconomic status only and not through the life cycle *per se* (Deurloo *et al.*, 1987; Kendig, 1984; McCarthy, 1976). By focusing mainly on income and price, the economic perspective downplays non-economic factors such as preference and discrimination in housing choice.

In contrast, demographers, geographers and sociologists argue that tenure choice is not a simple investment or consumption decision, but is a complicated event that is inextricably linked with characteristics of households and changes in the housing market (Clark and Dieleman, 1996). While recognising the importance of income, they argue that demographic characteristics of households—such as age, family size and composition—and trigger events which occur during the life-course—such as birth of children and marriage—are significant factors affecting tenure choice (Clark *et al.*, 1984; Deurloo *et al.*, 1987, 1994; Morrow-Jones, 1988). In general, when single persons become married, when couples turn into families and when people become older, they are more likely to shift to ownership.<sup>2</sup> In addition, changes in economic circumstance such as price inflation and increasing mortgage rates, can also affect residents’ tenure choice (Clark *et al.*, 1994; Deurloo *et al.*,

1994; Rudel, 1987). Compared with the economic approach, this socio-demographic approach sets tenure choice in the wider context of the life-course and demographic change.

Overall, the combined economic and socio-demographic literature on tenure choice has provided a good explanation of tenure choices in Western cities. However, there are limitations and underlying assumptions that constrain the application of the above theories and conceptualisations to socialist or transitional economies. First, in market economies, housing is considered a commodity and households purchase housing with their wages. In socialist economies, housing is a welfare benefit that government and employers provide to their employees who in turn are paid low wages without a shelter component. Although, in transitional economies, the nature of housing is in the process of being transformed from a welfare good to a commodity, there is still an interdependence between an employee's low wage and the employer's responsibility for housing provision. Employees, especially the older generations who have been working all their lives with low wages, are often unwilling to give up their 'right' to receive subsidised housing. Thus, employers and governments, although wishing to give up their responsibility for employees' housing, are often under pressure to continue housing subsidies. As a result, households in transitional economies are likely to have rather different tenure choices from those in market economies.

Secondly, although discrimination is often practised in housing markets (Galster, 1988; Massey and Denton, 1993), in general the Western model assumes relative freedom of choice in the housing market. Residents choose different tenures based in the main on personal preference and affordability. Tenure choice is somewhat constrained in some European housing systems where there is a large share of public housing and a rationing system is often practised, such as that in UK (King, 1980). Yet, there is a comparable stock of private housing for households to

choose and home-ownership is often desired (Saunders, 1990). However, in welfare-oriented housing systems where public rental housing is the only choice for the majority and private ownership is discouraged, there is clearly much less freedom of choice. Although housing reform has brought about a certain degree of freedom in housing choice, the existing housing stock and the previous housing institutions still constrain residents' housing choices, and thus a modified conceptualisation of tenure choice is required.

Thirdly, the government and market play rather different roles in different housing systems, which in turn affect housing tenure choice. In market economies, housing is predominantly private and price is the major force driving housing provision and consumption, while the government only provides some low-cost public housing to reduce the inequality generated by market mechanisms. Yet, in the socialist and transitional economies, public housing dominates and it is the government or government agencies who mainly control housing provision and allocation. Although equity is the goal of providing mass public housing, ironically, inequality is often embedded in the provision and allocation process (Bian *et al.*, 1997; Logan *et al.*, 1999; Szelenyi, 1983). The different government-market interaction results in different tenure choices and a different profile of housing distribution among the population. In market economies, it is often the lower class who choose inner-city rental and public housing and the upper or middle class who choose suburban private housing and owning, while in socialist and transitional economies such as China and Hungary it is the most privileged groups who can access public rental housing (Bian *et al.*, 1997; Szelenyi, 1983; Zhang, 1998) and the less-privileged groups who inhabit self-built housing (Zax, 1997).

Besides these underlying assumptions, the structure of housing tenure in urban China is also different from that in market economies. Housing tenure in urban China has experienced a zig-zag path in the past 50 years because of dramatic changes in ideology and

political economy. It has changed from mostly private rental housing in the early 1950s, to virtually all public rental housing after the Socialist Transformation (1956–66) and the Cultural Revolution (1966–76), and then to a mix of increasing home-ownership and decreasing public rental housing since the housing reform starting in 1988.<sup>3</sup> Before 1949, the majority of urban housing was private and the share of public rental housing was trivial because of the government's long-time involvement in war (Zhang, 1997). Although the government had built some public rental housing and transformed some private housing into public housing during the early 1950s, private housing remained the major housing type and renting was the major housing tenure in most cities until 1956. According to the Chinese Communist Party (CCP) Central Committee (1956), private housing accounted for 53.9 per cent in Beijing, 66.0 per cent in Shanghai, 78.0 per cent in Jilin, 86.0 per cent in Xuzhou and 80.3 per cent in Wuxi in 1955. Private housing was also concentrated in the hands of a few large landlords who let housing to the working class (Wang and Murie, 1999).

In 1956, the state began to control private rental housing regarding allocation, rent standards, maintenance and management, while most landlords remained nominal owners who received rent from the state instead of from tenants (Zhang, 1997).<sup>4</sup> By 1964, 70 per cent of the private rental housing stock was transferred to public ownership (Editorial Board, 1990). The Cultural Revolution continued the elimination of private ownership under the ideology of *yida ergong* (large-scale public ownership). A large amount of private housing was impounded and confiscated by the state and government agencies.<sup>5</sup> After the Cultural Revolution, both the state and work units significantly increased investment in public housing to improve housing conditions and to mitigate a severe housing shortage, and this in turn maintained the dominance of public rental housing.

Since 1988, private housing and home-ownership have been encouraged, which is a

complete reversal of housing policies during the Socialist Transformation and the Cultural Revolution. While there have been significant investments in non-public housing, such as 'commodity housing' and 'self-built housing', home-ownership in both the public sector and the private sector has been promoted through various methods. For example, subsidised prices are provided to encourage sitting tenants to buy public rental housing and private housing is mainly for owner-occupancy. In fact, 'affordable housing'—'commodity housing' targeting medium- and low-income households—in principle is only for sale and not for rent (State Council, 1998).

Thus the current housing stock in urban China is more complex than ever before. Compared with the dominance of private housing in the early 1950s and the dominance of public rental housing during 1956–88, now there is a mix of public and of private housing, and of rental and owner-occupied housing. At the same time, households now enjoy some freedom of housing choice and they can choose between public and private housing, and between renting and owning. It is essential to understand how individual households make their housing decisions, especially in the transitional era where both market and institutional forces may affect their housing behaviours. Yet, research on housing choice in China is very limited because the housing system was not open for public debate in socialist China. Housing systems in China have been poorly understood until the recent housing reform, which has generated a flourishing literature both within and outside China. As we noted earlier, most existing research is policy-oriented and focuses on macro aspects of the housing system, such as housing policies, housing problems and recent housing reform.

Recent research by Li (2000a, 2000b) has provided important findings on housing behaviour in urban China. After examining tenure decisions for new housing in Guangzhou and Beijing, he argues that the housing market is segmented and there are different forces governing tenure decisions in

different housing sectors. While tenure decisions for the open market housing are somewhat similar to those in Western housing markets, those for subsidised housing are quite different. Although some household characteristics such as the number of children and number of workers play a role, occupation is a much more critical factor in the decision process. Li (2000b) also argues that the traditional welfare-oriented housing system still imposes a significant influence on housing consumption in China, even in cities known for their openness and market orientation. Yet, the studies by Li have been limited to two cities (Guangzhou and Beijing) and to newly built 'commodity housing'. While focusing on the segmentation of the housing market, Li fails to examine the institutional context of tenure decisions in China—the socialist transition towards a market economy—and how it affects households' behaviour.

The analysis that follows extends the work by Li to assess both new and old housing and covers a national sample of households. It will study housing choice in the broad context of the transition from a socialist towards a market economy. Using a framework based on institutional relationships among households, work units and the government, housing behaviours will be scrutinised from the perspectives not only of households, but also of their institutional positions in the housing system. By situating housing behaviour in the socialist transition and by positioning households in the network of housing agents, both micro and macro factors affecting tenure decision can be examined.

### **Institutional Relationships and Tenure Choices**

Housing tenure choice is a decision based not only on household characteristics and housing market factors (Clark *et al.*, 1994; Deurloo *et al.*, 1994), but also on the institutional relationships between the main agents in the housing system. In Western cities, the latter are relatively straightforward and are often ignored in the housing literature. With pri-

vate developers as the dominant housing provider, employers and the state have virtually no housing responsibility to their employees/households.<sup>7</sup> The relationship between employees and employers is mainly an economic linkage, with the latter providing high wages (possibly with a shelter component) and the former purchasing housing from the market (see Figure 1). Households can choose to rent or own. The state or local government has only a peripheral influence on households' housing behaviour by providing tax incentives to encourage homeownership. And there is no direct housing relationship between the state and employers. This economically based relationship between the state, employers and households limits the applicability of existing theories in socialist and transitional economies where the institutional relationships between these agents are rather different.

In socialist urban China, housing was considered a welfare benefit such that both employers and the state had the responsibility to provide subsidised housing. While employers (work units) paid low wages to their employees, they had to provide subsidised housing. The allocation of housing was based on a queue system with those who have close relationships with the work unit listed at the top. Job rank and job seniority served as the indicators of the relationship between employees and work units.<sup>8</sup> People with higher job rank and job seniority were more likely to access public housing and rental was the only possible tenure. The state had two roles in the housing system. First, it provided housing investment to work units who then developed housing for their employees. The allocation of housing investment was based on the importance of work units to the national economy, which was indicated by the administrative rank of work units (Wu, 1996).<sup>9</sup> The higher the work unit rank, the more housing investment the work unit received. Secondly, the state also directly provided housing to households who could not access housing from their work units. Yet, only households with close relationships with the state and local government could qualify.

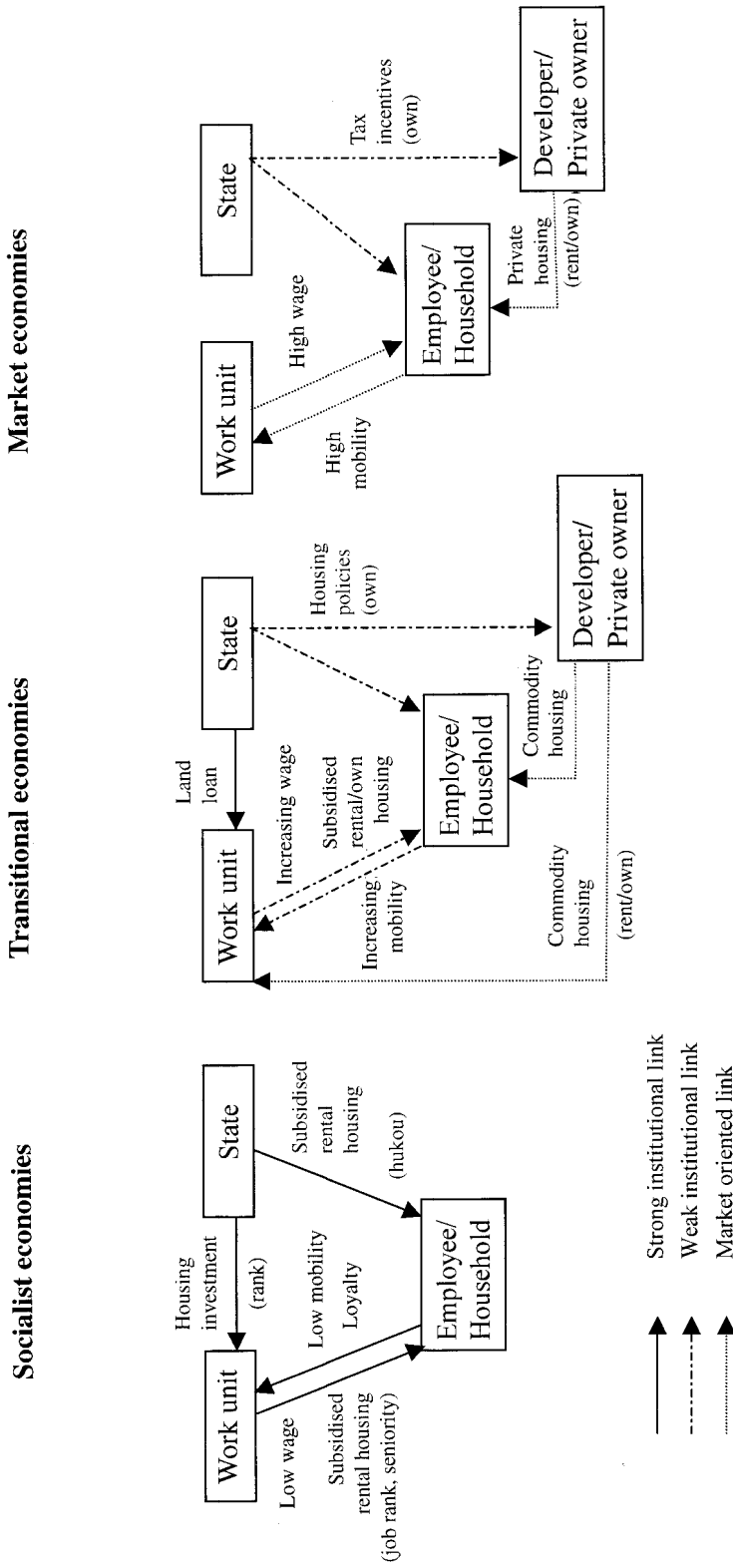


Figure 1. Social relationships and tenure choices in different economies.

The household registration (*hukou*) system served as the filter.<sup>10</sup> Only households with urban and permanent *hukou* qualified for housing provided by the state. Additionally, households could only choose to rent. And home-ownership was discouraged in socialist urban China.

Housing reform, aiming to create a functional housing market, has granted households a certain degree of freedom of housing choice and thus has changed the nature of the housing system in urban China in four important aspects. First, the institutional relationship between employees and employers in the transitional economy has been changing from the previously symbiotic and interdependent relationship towards a simpler wage-based economic relationship. On the one hand, work units are gradually giving up responsibility for housing provision and substituting in-kind subsidies with monetary rewards through higher wages because of the large financial burden involved in providing subsidised housing (World Bank, 1992; Zhang, 1998). Sitting tenants of existing subsidised housing are encouraged to buy their occupied flats as opposed to paying increased rent which is proposed to reach market level in the near future (Tolley, 1991; Wang and Murie, 1996; Zhou and Logan, 1996).<sup>11</sup> On the other hand, work units continue to expect an interdependency between employees and employers, characterised by employers' responsibilities of providing cheap housing, stable employment and other services in exchange for employees' low wages, lifetime contribution and loyalty. Employees are unwilling to give up their 'right' to subsidised housing under this mutual agreement, which in turn imposes pressure on employers to continue their responsibility for cheap housing. Several temporary methods have been employed by work units to balance the subtle relationship during the transitional era.

(1) Housing vouchers are issued to compensate for the increasing rent of work-unit-provided housing (Wang and Murie, 1996).

- (2) Work-unit-provided housing is sold to employees at heavily subsidised prices.
- (3) Monetary housing subsidies (*zhu fang bu tie*) are issued for households to purchase housing (State Council, 1998).<sup>12</sup>
- (4) The Housing Provident Fund (*zhu fang gong ji jing*) has been created to help households to purchase housing (State Council, 1999).<sup>13</sup>
- (5) Work units purchase 'commodity housing' units at market prices and then either allocate them to their employees as if they are 'public housing' or sell them to their employees at much lower prices.

These new forms of housing subsidy are testimonies of lingering, although changing, housing dependency between employers and employees. While some of these subsidies are salary-based, such as the Housing Provident Fund, many are still allocated based on factors such as job rank and job seniority. For example, people in the same work unit pay different subsidised housing prices due to 'job seniority discount' (*gong ling ze kou*).<sup>14</sup> This subtle institutional relationship is shaping households' housing ideology and behaviour by both imposing constraints on and providing opportunities for housing choices.

Secondly, the changing institutional relationship between the central state and work units also affects housing choices. In the transitional period, although the state still plays a significant role in aspects such as providing loans and land for residential development and setting up the framework for housing reform, it no longer allocates housing investment to work units and work units are now responsible for housing investment out of their own budgets (Logan *et al.*, 1999). Thus work units with more resources are able either to build more housing themselves or to buy more 'commodity housing' from the market and then subsidise the distribution of housing to their employees. With the availability of subsidised housing, employees in these work units are unlikely to turn to other types of housing such as 'commodity housing'. In contrast, employees who are working

in 'poor' work units with few housing resources have no choice but to turn to the private sector for shelter. The discontinuity of the state as a housing investor reinforces the role of work units and thus affects households' housing choice, which may lead to a work-unit-wide pattern of housing choice.

Thirdly, even though the state no longer provides new housing directly to households in the transitional era, it still affects households' tenure choice through its housing policies.

- (1) The freedom of tenure choice is limited. Sitting tenants of subsidised housing are given the choices of continuing renting or owning. But it is only limited to their currently occupied flats, with no tenure choice for other units within or across work units. The newly constructed 'affordable housing' is in principle for sale according to the state's 'new policies for new housing stock' (State Council, 1998). A private rental market virtually does not exist.<sup>15</sup> The government's encouragement of home-ownership, developers' desire for short-term profits in a rapidly changing context and historical discouragement of a private rental market in the early socialist era may have contributed to the current lack of a private rental market in China.
- (2) Unclear property rights also constrain households' tenure choice. While the property rights of home-owners are limited and ambiguous, the rights enjoyed by renters of subsidised housing are far greater than tenant rights, to the extent that some call them *de facto* owners (Tolley, 1991). On the one hand, urban land in China is owned by the state and home-owners only have user rights of the land beneath their flats/houses. On the other hand, to encourage home-ownership, public housing is sold to its sitting tenants at different prices with different property rights. Except for the market price (*shichang jia*) that is associated with 'full' home-ownership rights, both cost price (*chengben jia*) and stan-

dard price (*biaozhun jia*) are subsidised prices and are linked to partial property rights of home-ownership.<sup>16</sup> Buyers have rights of use and succession, but they cannot freely release the flats/houses to the market and profit from them.<sup>17</sup> In contrast, renters of subsidised housing have full rights of use and succession (Tolley, 1991) which are not very different from partial home-owner rights. Without clearly defined property rights, residents are uncertain about their future rights and their housing tenure shift from renting to owning is likely to be constrained.

Thus, households are not equally situated in the transitional housing system. State policies such as those on property rights and on households' qualification for different housing and tenures still constrain households' freedom of housing choice and shape their housing behaviours.

Fourthly, the fact that work units and the state are gradually giving up their responsibility for housing provision has provided opportunities for private developers and owners. Private housing by these parties is becoming a more and more important housing option. Although work units were the major consumers of 'commodity housing' at the early stage of housing reform (Wu, 1996), individual consumption of private housing is rapidly increasing. Households can choose to own or rent. Yet, 'commodity housing' is accessible only to households with urban and permanent *hukou*, with a few exceptions for blue *hukou* holders.<sup>18</sup> Migrants with rural or temporary *hukou* may access private housing by individual owners; yet they are in general unqualified for home-ownership in cities.<sup>19</sup>

In summary, the housing system in urban China is in the process of changing from a welfare-oriented housing system with strong institutional relationships among the state, work units and households towards a market-oriented housing system with relatively weaker institutional relationships among the three agents. Households in transitional ur-



ban China are given the options of owning and renting in both the public and private sectors. Yet, there is still lingering institutional relationship between households and public agents which defines the transitional nature of the current housing system and influences households' tenure choice. From the perspective of the transitional economy, we can study both market forces and socialist institutions that affect tenure decisions. At the same time, the framework of institutional relationships allows us to examine tenure decisions from not only the perspective of households and the housing market, but also from the position of households in relation to other housing agents in the system. This research begins with the general hypothesis that housing tenure choice in urban China is affected by both the socioeconomic factors and the institutional factors characterising the relationships among households, work units and the state. We also hypothesise that the stronger the relationship among these agents, indicated by higher work unit rank, higher job rank and job seniority as well as urban and permanent *hukou*, the more likely it is that households will access public rental housing and the less likely it is that they will shift to home-ownership.

## Analysis

### *Data and Statistical Methods*

The study utilises a national survey of *Life Histories and Social Change in Contemporary China*.<sup>20</sup> This survey was conducted in 1996, using a multistage probability sampling stratified by education level to ensure the representativeness of different strata of population (Treiman, 1998).<sup>21</sup> The county-level units—county-level cities, counties and urban districts in prefecture-level and provincial-level cities (in brief, cities)—serve as the primary sampling units (PSUs).<sup>22</sup> These PSUs are stratified into 25 equal population strata according to the county-level proportion of the population aged 20–69 with at least middle school education, which is obtained from the 1:100 sub-set of the 1990

census. Two county-level units are selected from each stratum with probability proportional to population size; and then one township-level unit is selected from each selected county-level unit and two village-level units are selected from each selected township-level unit with same probability sampling technique. Within each village-level unit, a list of adults aged 20–69 is created according to the household registration (*hukou*) list and the list of temporary (migrant) residents. Then 30 adults, and thus 30 households, are randomly selected from the 2 lists in proportion to their contribution to the total population. More than 3000 urban households were surveyed nation-wide. This data-set includes not only information on a household's housing status and housing condition such as size, facilities and year built, but also a wide range of demographic, socioeconomic and institutional information at the individual, household and work unit level, which allows sophisticated analyses of housing choices.

It is expected that the data-set has cluster effects given its multistage sampling design, which violates the assumption of independent observations in the ordinary least square (OLS) regression. While survey regressions, available in programmes like STATA 5.0, take the cluster effects into account using the Huber–White adjustment, they only correct standard errors and yield the same coefficients as those estimated in OLS regression. Thus a multilevel analysis, which is designed for dependent (or nested, clustered) observations, is used in this research. Since households in the same city are under the constraints of same local housing policies and same housing stock, they are more likely to have similar choices than households in another city with different housing stock and housing policies. So a cluster effect exists in housing choices at the city (county-level unit) level, which will be taken into account in a two-level modelling with city as the macro level and individual households as the microlevel.<sup>23</sup>

The study uses a random coefficient model to analyse tenure choices. Conceptually,

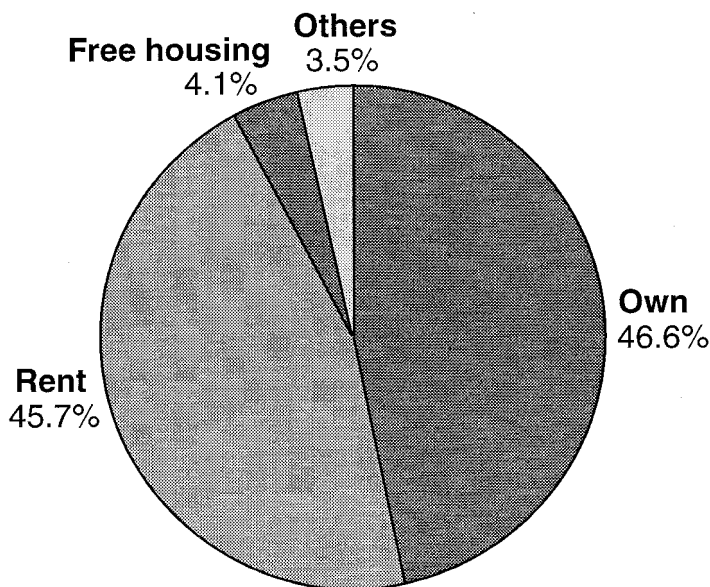
housing reform is uneven across cities and a random effect model can capture the regional differences. Statistically, a random coefficient model is needed because: the county-level units in this data-set are a sub-population sampled from all county-level units in China; the group size is relatively small (about 60 households); and, we wish to test the effects of macro-level variables on housing choices (Snijders and Bosker, 1999). Thus, a two-level (with households as level-one units and county level-units (cities) as level-two units) logistic regression with random coefficients will be conducted to analyse housing tenure choices.

### *Descriptive Analyses*

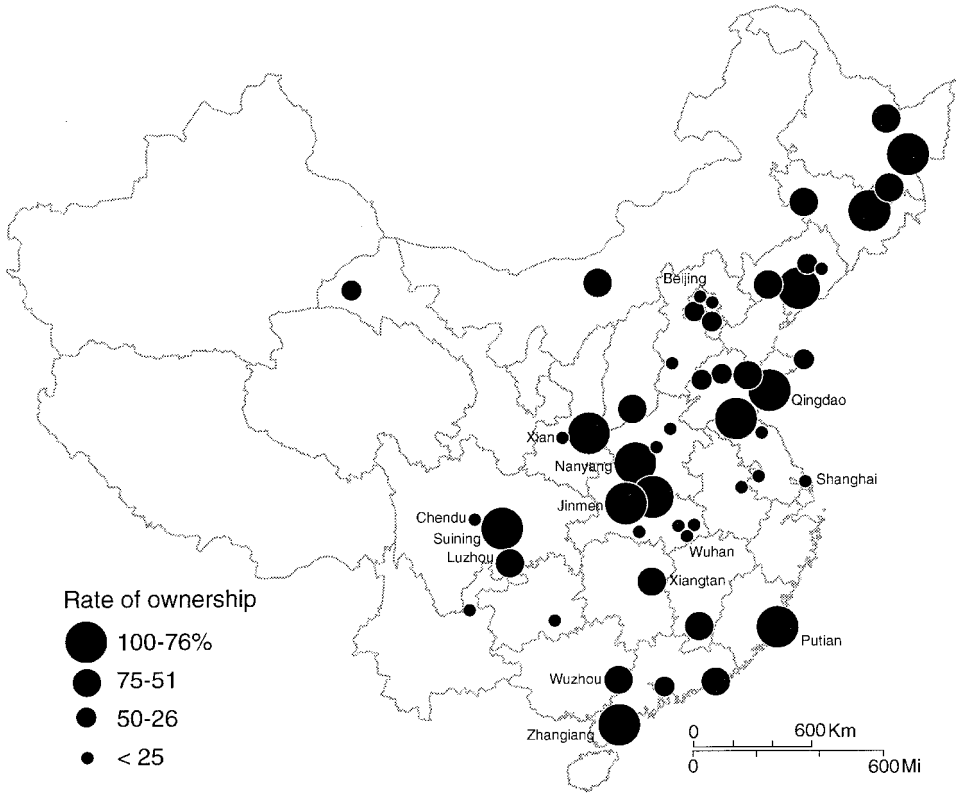
Housing reform in urban China has not only significantly increased per capita living space from 3.6 square metres in 1978 to 9.3 square metres in 1998, but it has also changed the structure of housing tenure. According to the survey, about 47 per cent of Chinese urban households own their homes and another 46 per cent are renters in 1996 (Figure 2). The rate of home-ownership has increased significantly during the reform period com-

pared with less than 20 per cent at the beginning of the reform (Bian *et al.*, 1997). Besides the subsidised sale of public housing, the availability of 'commodity housing' and the promotion of 'self-built housing' have contributed to an increasing rate of home-ownership. Yet, the rate of home-ownership in transitional China is still lower than that in most Western societies, especially the US (64 per cent; Clark and Dieleman, 1996).

The rate of home-ownership also varies significantly across cities (Figure 3). It ranges from 3.3 per cent in Hongshan district in Wuhan City, to 90 per cent in Dongbao district in Jimeng City, both in Hubei province, with a mean of 46.8 per cent and a standard deviation of 30.1 per cent. While there are 18 cities with a rate of home-ownership of less than 25 per cent, there are also 12 cities with more than 76 per cent home-ownership. In addition, there is no obvious spatial pattern—both the coastal and the inland cities may have a high or a low rate of home-ownership. Yet, cities with a high rate of home-ownership are in general small cities with less than 500 000 population.



**Figure 2.** Housing tenure choice in urban China, 1996. *Source:* 1996 Survey.



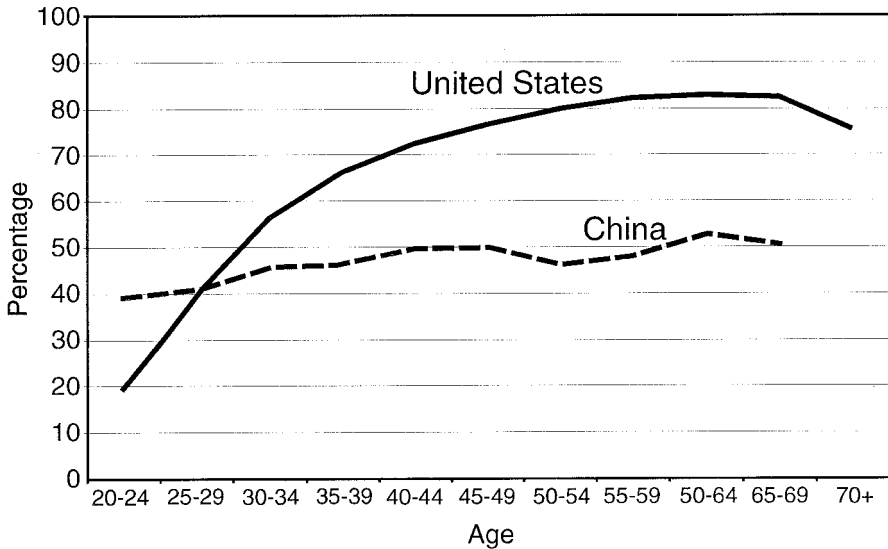
**Figure 3.** The home-ownership rate in surveyed cities, 1996.

In general, home-ownership increases with age. Yet the pattern is rather different from that in the US with higher rates of home-ownership among young generations and lower rates of home-ownership among older generations (Figure 4). In China, the rate of ownership among people in their early 20s is about twice as high (38.7 per cent) as that in the US (19.5 per cent). Yet it only increases moderately with age, reaching 50 per cent for the age-group of the late 60s—much lower than that among the same cohorts in the US.

In transitional China, the relationship between ownership and income also turns out to be different from that in market economies. In contrast to the general increase in ownership with income in market economies (Clark and Dieleman, 1996), the relationship in China is curvilinear. The rate of ownership is highest (59.3 per cent) among households with the lowest income (less than 5000 yuan

annually) and it is lowest among households with medium incomes (34.4 per cent for households with 15 000–19 999 yuan) (Figure 5).<sup>24</sup> In general, the ownership rate decreases with household income. It only increases slightly among households with high incomes (25 000+ yuan) and it is still lower than that among the lowest-income group (45.9 per cent versus 59.3 per cent). Even controlling for age, the curvilinear relationship between income and ownership persists. Both the low-income group (< 10 000 yuan) (48.03 per cent of all households) and the high-income group (> 25 000 yuan) (8.3 per cent of all households) have relatively high rates of home-ownership, while the ‘middle classes’ (10 000–24 999 yuan) (43.7 per cent of all households) have a relatively low rate of ownership.

This unusual relationship between age, household income and ownership reflects the



**Figure 4.** Home-ownership rates by age in urban China (1996) and the US (1990).

uniqueness of the transitional housing system. While some households are consuming 'commodity housing' and their tenure choice depends more on socioeconomic factors, such as income and age, the majority of urban households are still affiliated to the public housing system in which age and income do not matter very much. Instead, the close housing relations among households, work unit and the state, although under reform, still affect households' housing access and tenure choice. For example, urban and permanent *hukou*, indicating a close relationship between households and the state/local government, are requirements for households to access public rental housing and purchase both public and private housing, while those with rural *hukou* or migrants with temporary *hukou* in general do not qualify.<sup>25</sup> Thus the rates of home-ownership among households with different *hukou* are different (Table 1). Among those with permanent *hukou*, only people with urban *hukou* qualify for subsidised rental housing, so they have a much lower rate of home-ownership than those with rural *hukou* (48.7 per cent versus 73.2 per cent).<sup>26</sup> Migrants with temporary *hukou*, either urban or rural *hukou*, in general cannot purchase housing at their destinations, so

they have much lower rates of home-ownership (29.6 per cent and 12.2 per cent respectively) than those with permanent *hukou*. Yet, migrants with urban *hukou* are slightly favoured in the housing system and they have a higher rate of home-ownership than migrants with rural *hukou*.

In addition, the rank of work units and a person's job rank and job seniority can affect tenure choice (Table 2). In general, people working in higher-rank work units are less likely to own because high-rank work units usually have more resources to provide subsidised rental housing and they are also more conservative in housing reform. Less than a quarter of people working in prefecture or higher-rank work units (23.0 per cent) are owners compared with more than half of those working in village-level or other work units (52.9 per cent). People with high job rank are also less likely to own because they are more likely to access subsidised rental housing. About 20 per cent of department or higher-level cadres are owners, while 47.2 per cent of ordinary workers are owners. However, people with high job seniority are more likely to be owners, especially those with more than 20 years of working relationship with their work units (60.8 per cent).

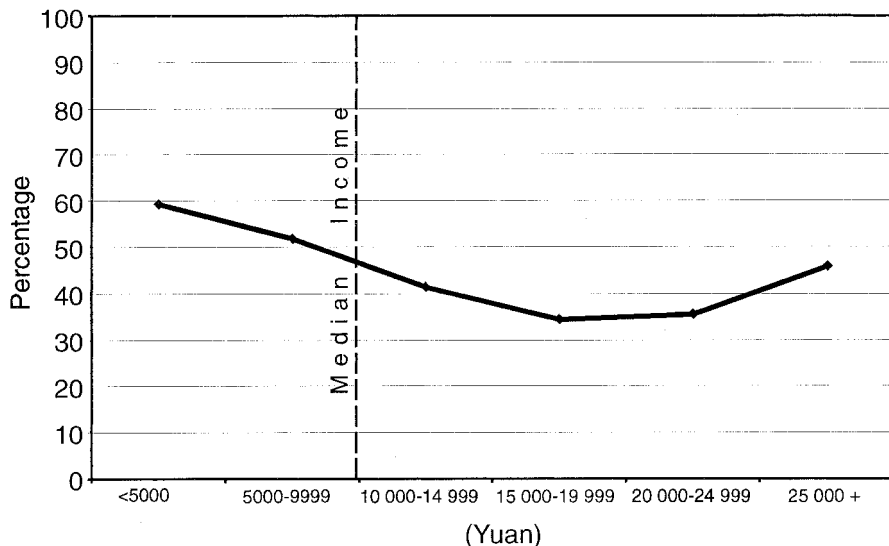


Figure 5. Home-ownership by household income in China, 1996.

Table 1. The rate of home ownership, 1996

	Urban <i>hukou</i>		Rural <i>hukou</i>	
	Percentage	Number	Percentage	Number
Permanent <i>hukou</i>	48.65	2561	73.17	164
Temporary <i>hukou</i>	29.55	44	12.18	238

Source: 1996 survey.

Table 2. The rate of home ownership, by work unit rank, job rank and job seniority, 1996

	Ownership (percentage)	Total number
<i>Work unit rank</i>		
Village level or others	52.86	1801
Township/county level	39.06	1111
Prefecture, provincial or central level	23.02	126
<i>Job rank</i>		
Ordinary workers or others	47.23	2793
Team leaders, village or township-level cadre	46.48	71
Section or division-level cadre	41.71	187
Department, bureau or higher-level cadre	20.69	29
<i>Job seniority years</i>		
< = 5	40.26	1289
6-10	49.43	702
11-20	49.81	795
21+	60.79	278

Source: 1996 survey.

**Table 3.** Major characteristics of renters, owners and their houses, 1996

	Owners	Renters
<i>Renters and owners</i>		
Age in years (mean)	43.00	41.67
Education (average years of schooling)	8.00	9.19
Marital status (percentage married)	91.87	89.80
Average household size (persons)	3.73	3.19
Number of workers	1.73	1.69
Median household income (yuan)	8 880	10 800
Family business (percentage)	26.27	16.63
<i>Hukou1</i> (percentage of rural <i>hukou</i> )	11.50	13.11
<i>Hukou2</i> (percentage of temporary <i>hukou</i> )	4.81	12.70
Job rank	1.71	1.72
Job seniority (years)	10.58	8.80
Work unit rank	2.13	2.51
<i>Houses</i>		
Rooms per person	1.09	0.81
Space per person (square metres/person)	23.35	14.03
<i>Period of construction</i> (percentages)		
Before 1980	25.18	35.85
1980–89	45.25	44.38
1990–96	29.56	19.77
Private bathroom (percentage)	47.57	62.89
Piped gas (percentage)	5.35	19.50
Tap water (percentage)	93.61	93.20
Central heating (percentage)	25.92	26.06

Source: 1996 survey.

Although people with high job seniority are also more likely to access public rental housing, they enjoy significant 'job seniority discount' in housing sale prices, which obviously results in cheap prices and encourages home-ownership.

Although home-owners in transitional urban China are a very diverse group (for example, owners of public housing and owners of private housing) and they may be very different from owners in the West, they still have distinctive characteristics (Table 3). Compared with renters, owners in urban China are relatively older (mean age 43 versus 41.7 years), more likely to be married (91.9 per cent versus 89.8 per cent), have larger households (3.7 versus 3.2 persons) and their households have more workers (1.73 versus 1.69). They are also more likely to own a family business (26.3 per cent versus 16.6 per cent). Yet, owners in China

have less education (8.0 as against 9.19 years) and lower household incomes than renters (median income 8880 as against 10 800 yuan). In addition, owners are also less likely to hold temporary *hukou* (4.8 per cent versus 12.7 per cent). Yet, they tend to have more seniority (10.6 as against 8.8 years) and are affiliated with low-rank work units (2.13 versus 2.51). The job ranks for owners and renters are rather similar.

In addition, housing conditions differ with tenure. Owner-occupied housing is relatively larger and less crowded than rental housing. The average number of rooms per person is 1.1 and the space per person is 23.4 square metres for the former, compared with 0.8 and 14.0 respectively for the latter. Owner-occupied housing is also newer than rental housing. About one-third of owned housing was built in the 1990s compared with 19.8 per cent for rental housing. Yet, owner-

occupied housing seems to have fewer facilities. Less than half of owned houses (47.6 per cent) have a private bathroom and only 5.35 per cent have piped gas, while the percentages for rental housing are 62.9 and 19.5 respectively. This lack of facilities in owner-occupied housing might be a result of old private housing built before 1949 and an increasing share of self-built housing—often lacking piped gas and a fully furnished bathroom.

### *Multilevel Logistic Regression*

The multilevel logistic regression tests the hypothesis that both socioeconomic and institutional factors affect households' tenure choice in transitional urban China. The dependent variable is tenure choice, 1 for own and 0 for rent.<sup>27</sup> The intraclass correlation coefficient (ICC) is 0.444, indicating that two randomly drawn households in one randomly drawn city have a correlation of 0.444—i.e. 44.4 per cent of total variability in tenure choice lies at the city level.<sup>28</sup> The significant cluster effect further legitimises the use of multilevel modelling.

There are three sets of independent variables that are used to test the impacts of socioeconomic, institutional and city-level effects (Table 4). The socioeconomic variables include age, age squared, education, education squared, marital status, household size, number of workers, household income and family business. It is expected that both age and education have a curvilinear relationship with home-ownership and the square terms are used to depict it. It is also expected that being married, having larger households and more workers, higher household income and having family businesses will have positive effects on ownership. The second set are institutional variables characterising the relationship among households, work units and the state. It includes *hukou* classification and *hukou* location, work unit rank, job rank and job seniority. It is expected that rural *hukou* and temporary *hukou*, indicating a weak relationship between households and the state/local government, will have negative effects

on ownership because in general people with these types of *hukou* do not have access to urban home-ownership. At the same time, high work unit rank, indicating a strong relationship between the state and work units, and high job rank, indicating a close relationship between work units and employees, are expected to have negative effects on ownership. Yet, high job seniority—an indicator of a close relationship between households and work units—is beneficial for households to access public rental housing on the one hand and to enjoy the subsidised sale price of public housing (due to 'job seniority discount') on the other hand. With the two contradictory forces, its effect on tenure choice is uncertain. The third set includes a single city-level variable—sale price for commodity building (including housing, office and other commercial buildings). It is considered as a proxy for commodity housing price, and it is expected to have a negative effect on the average rate of home-ownership.

The multilevel model has the following format

#### *Level 1:*

$$\text{Prob}(Y = 1) = P$$

$$\log \frac{P}{1 - P} = \beta_0 + \beta_i * X_i \beta_j * X_j$$

#### *Level 2:*

$$\beta_0 = \eta_{00} + \eta_{01} * X_3 + \mu_{00}$$

$$\beta_i = \eta_{i0}$$

$$\beta_j = \eta_{j0} + \mu_{j0}$$

where,  $Y$  = tenure choice;  $P$  = probability of owning;  $(X_i)$  = socioeconomic variables ( $i = 1, 2, \dots, 9$ );  $(X_j)$  = institutional variables ( $j = 1, 2, \dots, 5$ );  $X_3$  = city-level variables;  $\mu_{00}$  = random effect for the intercept, assuming  $\mu_{00} \sim N(0, \tau_{00}^2)$ ; and  $\mu_{j0}$  = random effects for coefficients, assuming  $\mu_{j0} \sim N(0, \tau_{j0}^2)$ .

The Level 1 equation is a logistic regression of the probability of owning ( $P$ ) on socioeconomic variables ( $X_i$ ) and institutional variables ( $X_j$ ). It aims to explain the

**Table 4.** Definition and descriptive statistics of variables

	Percentage	Mean	Standard deviation
<i>Dependent variables</i>			
<i>Tenure choice</i>			
1: Own	50.47		
0: Rent	49.53		
<i>Independent variables</i>			
<i>Socioeconomic variables</i>			
Age		41.98	13.47
Age <sup>2</sup> (age squared)			
Education (years of schooling)		8.58	3.98
Education <sup>2</sup> (education squared)			
Household size		3.42	1.31
Number of workers		1.93	1.08
Household income (yuan)		14 456	46 562
<i>Family business</i>			
1: Yes	21.12		
0: No	78.88		
<i>Marital status</i>			
1: Married	89.76		
0: Otherwise	10.24		
<i>Institutional variables</i>			
Job rank		1.75	1.71
Job seniority		9.44	9.09
<i>Hukou1</i>			
1: Rural hukou	14.76		
0: Urban hukou	85.24		
<i>Hukou2</i>			
1: Temporary hukou	11.55		
0: Permanent hukou	88.45		
Work unit rank		2.36	0.85
<i>City-level variables</i>			
Sale price for commodity building (yuan/square metre) <sup>a</sup>		1 423	1 011

<sup>a</sup>1994 data (source: SSB, 1996).

variability in the probability of owning at household level. At Level 2, both the intercept ( $\beta_0$ ) and coefficients ( $\beta_i$ ,  $\beta_j$ ) at Level 1 are dependent variables. The intercept ( $\beta_0$ ) has a random effect  $\mu_{00}$  to depict the intercity heterogeneity in the average level of the probability of owning, and the city-level variable housing price ( $X_3$ ) is used to explain partially the heterogeneity. The coefficients for socioeconomic variables ( $\beta_i$ ) are fixed because there is no theoretical base for arguing that socioeconomic variables have differ-

ent effects on the probability of owning in different cities and, empirically, the random effects for socioeconomic variable coefficients are not significant. The coefficients for institutional variables ( $\beta_j$ ) have random effects ( $\mu_{j0}$ ) because the effects of institutional factors on tenure choice vary significantly as shown in the descriptive analyses. Factors such as different local housing policies and the different history of housing and urban economy between cities may contribute to the heterogeneity, which



will be captured by the random effects. The Level 2 equations aim to explain the differences in intercepts and coefficients between county-level units.

The model uses a first-order restricted penalised quasi-likelihood (PQL) estimation procedure with HLM 5.0. The model has a very good fit with  $R^2 = 0.264$  and the results support the hypotheses (Table 5).<sup>29</sup> First, the socioeconomic factors are significant in determining households' tenure choice. While some variables have effects similar to those in market economies, some have rather different effects. On the one hand, age has a positive but curvilinear effect on the probability of being an owner, with a positive coefficient for age (0.082) and a negative coefficient for age squared ( $-0.001$ ). With all variables in the equation, the probability of owning is the highest at age 41, which is younger than that in US (Clark and Dieleman, 1996). Both household size (0.359) and household income ( $6.0E-6$ ) have positive effects, indicating that larger and better-off households are more likely to own. On the other hand, marital status and number of workers have negative effects on the probability of owning ( $-0.647$  and  $-0.181$  respectively), which is contradictory to Western findings. Yet, given the housing allocation system in China, it is not surprising. Being married is one of the most important requirements for a person to access subsidised rental housing provided by work units. Single employees usually have no choice but to live in temporary housing such as dormitories and offices (13.9 per cent), or to live with their families (21.8 per cent in housing rented from parents' work units and 37.0 per cent in housing owned by family). In addition, households with more workers are more likely to gain subsidised rental housing because of the possible affiliation with more than one work unit. This relatively easy access to subsidised housing because of being married or having more workers in the households may retain households in the public sector of rental housing and discourage them to become home-owners.

However, the variables education and fam-

ily business are not significant. As we have discussed, the nature of work units affects their ability to provide housing and thus affects households' tenure choice. Education and research institutions often face difficulties providing good housing for their employees due to their non-profit nature. It is not uncommon for highly educated people such as professors and researchers to live in crowded and temporary housing (for example, university dorms), which discourages their choice of home-ownership. Yet, the coefficient of education is positive (0.028) and that of education<sup>2</sup> is negative ( $-0.004$ ), which points to the direction of a positive but curvilinear effect of education on the probability of owning. Since family business can range from a large-scale enterprise/business to small-scale petty trade, it may have different effects on ownership. While a large enterprise yields a high income and encourages home-ownership, petty trading often means low and unstable income and discourages home-ownership. The large variation in family business may contribute to its lack of significance in tenure choice.

Secondly, institutional variables indicating the relationship among households, work units and the state are still playing significant roles in tenure choice. In contrast to the general hypothesis that a close institutional relationship discourages ownership, the strength of the institutional relationships may have different effects based on the nature of the relationship. As expected, work unit rank has a negative effect ( $-0.096$ ) on the probability of owning. Since high-rank work units are important to the state, they have more resources to provide subsidised rental housing and they are relatively more conservative in housing reform. Thus, people working in these work units are more likely to stay in the rental sector than shift to ownership. In addition, *hukou2* has a negative effect ( $-1.503$ ), indicating that households with temporary *hukou* are about 78 per cent less likely to own compared with those with permanent *hukou* (odds ratio =  $e^{-1.503} = 0.225$ ). The requirement of permanent *hukou* for purchasing most public housing and 'commodity

Table 5. Multilevel logistic regression on tenure choices

	Fixed effect	Standard error	P value	Random effect	Chi-squared	P value
<i>Socioeconomic variables</i>						
Age	0.082	0.033	0.012**			
Age <sup>2</sup>	-0.001	0.000	0.040**			
Education (years of schooling)	0.028	0.043	0.507			
Education <sup>2</sup>	-0.004	0.003	0.133			
Marital status (1: married; 0: otherwise)	-0.647	0.219	0.004***			
Household size	0.359	0.053	0.000***			
Number of workers	-0.181	0.074	0.015**			
Household income	6.0E-06	3.0E-06	0.086*			
Family business (1: yes; 0: no)	-0.034	0.149	0.820			
<i>Institutional variables</i>						
Job rank	0.062	0.047	0.196	0.030	54.426	0.051*
Job seniority	0.016	0.009	0.078*	0.001	81.576	0.000***
Hukou1 (1: rural; 0: urban)	0.233	0.307	0.453	2.205	82.144	0.000***
Hukou2 (1: temporary; 0: permanent)	-1.503	0.267	0.000***	0.920	53.846	0.057*
Work unit rank	-0.096	0.049	0.057**	0.033	54.444	0.051*
<i>City-level variables</i>						
Commodity building price (yuan/square metre)	-4.1E-04	1.7E-04	0.021**			
Constant	-1.695	0.722	0.023	2.940	254.902	0.000***
Number of observations	2845					
-2*Log likelihood	7946.57					
-2*Log likelihood with no covariates	8103.76					
R <sup>2</sup>	0.2639					
Estimation	Restricted penalised quasi-likelihood (PQL)					

\*\*\*indicates significant at the 1 per cent level; \*\*indicates significant at the 5 per cent level; \*indicates significant at the 10 per cent level.

housing' has significantly reduced migrants' home-ownership in the cities. However, job seniority has a positive effect (0.016), indicating that people with high job seniority are more likely to own than those with lower job seniority. This bears out the earlier comment that high job seniority not only contributes to a person's easy access to public rental housing, but also leads to cheap sale prices of public housing due to 'job seniority discount'. With the pressure of increasing rent, people with high job seniority tend to take advantage of cheap sale prices and shift to ownership.

Furthermore, these variables have significant random effects, indicating that their effects vary significantly between cities. Although the fixed effects of job rank and *hukou* classification (rural versus urban) are not significant, they have significant random effects at the city level. In particular, the random effect for *hukou* classification is relatively large (2.205), which indicates that the constraints of rural *hukou* on ownership vary significantly across cities due to different local policies on housing access and a different history of urban development. Although, in general, people with rural *hukou* are not qualified for owning public housing and 'commodity housing', in smaller and more open cities, people with rural *hukou* can obtain ownership either through building housing themselves or by purchasing private housing. The random effects of institutional variables indicate the complex pattern of tenure choice in China because of work units and governments' involvement in the housing system and its regional variation.

Finally, the sale price for commodity building has a significant negative effect ( $-4.1E-04$ ) on the average level of ownership. It explains about 16.3 per cent of Level 2 variance.<sup>30</sup> It shows the importance of macro-level (city) housing market factors on households' tenure choice, which echoes the Western literature (Clark *et al.*, 1994; Deurloo *et al.*, 1994). Yet, there is still a significant random effect at the city level (2.94), which is either not captured by housing price or purely unobserved heterogeneity between cities.

## Summary

As part of the economic transition, housing reform in urban China aims gradually to introduce market mechanisms into a socialist housing system. It has not only significantly changed the nature of the housing system in urban China, but has also changed households' housing behaviour. Compared with the pre-reform era when households had no choice but to wait for subsidised rental housing, households now enjoy some freedom of housing choice. In addition to public rental housing which was the dominant tenure in socialist urban China, households can choose private housing such as 'commodity housing' and 'self-built housing', and can choose between renting and owning. Yet their choices are constrained by the transitional nature of the current housing system where both market mechanisms and socialist institutions operate simultaneously. Although housing reform aims to reduce the housing dependency between households and public agents (work units and the state), the housing linkages between these agents, in a somewhat different format from the previous eras, persist. The lingering housing relationship together with the emerging market forces create a unique context within which households operate and thus affect households' tenure choice.

Instead of the socio-demographic and economic approach in housing choice literature, we employ a framework based on the institutional relationships among major actors in the housing system—households, employers, the state, the local government and developers. This framework allows us to study tenure choice not only from the perspective of households and the housing market, but also with respect to the position of households in a web of institutional relationships with other agents in the housing system. We argue that tenure choice in urban China is constrained not only by household characteristics and the housing market, but also by factors that characterise the institutional relationships among households, work units and the government. We also argue that a closer institutional relationship among these agents in general dis-

courages households from choosing home-ownership. In addition, the relationships between households and other agents in the housing system vary across cities, and thus tenure choice demonstrates intercity differences. A multilevel modelling method is used to reveal the regional variations.

Using a national survey, the empirical analyses support the hypothesis that both socioeconomic factors and institutional forces affect households' tenure choices in transitional urban China. While older age, larger household size and higher household income encourage home-ownership as in the West, married people and households with more workers are less likely to own because of the lingering housing dependency between households and work units. Institutional variables, characterising the relationships among the state, work units and households, have significant effects on tenure choice. People working in high-rank work units and those with temporary *hukou* are less likely to own because the former are more likely to access subsidised rental housing and the latter are in general not qualified for home-ownership in cities. At the same time, those with high job seniority are more likely to own, probably due to the 'job seniority discount' in housing prices. But these effects all vary significantly at the city level. Although job rank and *hukou* classification do not have significant fixed effects as expected, they have significant random effects at the city level. These random effects indicate that the transition from a welfare to a market-oriented housing system is taking place rather differently in different cities. Furthermore, high housing prices discourage ownership and lead to a low rate of home-ownership at the city level, which is similar to findings in Western housing markets.

## Notes

1. The Chinese government claims that China is still a socialist country but with Chinese characteristics since it began economic reform and adopted open-door policies in 1978. Yet, we believe that in the past two decades China has been institutionally different from that before 1978. So in this paper, 'socialist China' refers to China between 1949 and 1978, and 'transitional China' refers to China since 1978. Likewise, the term 'socialist economy' refers to a traditional socialist economy, while the term 'transitional economy' refers to a socialist economy under reform. *Nation-wide* housing reform was not launched until 1988 after several experimental programmes during 1978–88.
2. Later in the life-course, there is a tendency to return from owning to renting when people are ageing and children leave home (Murie *et al.*, 1991; Clark and Dieleman, 1996).
3. Since private ownership was contradictory to socialist ideology, the Chinese government tried to restructure the social and economic system gradually and peacefully. During 1956–66, most private properties were transformed into public ownership through various methods such as government 'purchase'. Private housing was one of the main subjects to be transformed. The *Report on Urban Private Housing Property and Suggestions for Socialist Transformation* by the Chinese Communist Party secretariat in 1955 (Zhang, 1997) indicated the beginning of the Socialist Transformation in housing.
4. Besides state management, there were also other types of socialist transformation such as public–private partnership and a regulatory approach suggested by the CCP Central Committee (1956). Please see Zhang (1997) and Wang and Murie (1999) for a detailed description for these two types of transformation. CCP released another report in 1958, *A Report on the Transformation of Urban Private Housing*, which clearly stated its preference for state management as the major form of transformation.
5. There were no formal statistics and detailed records on how much housing was confiscated. However, according to a central government document, 340 000 households in 130 major cities and 265 towns lost their privately owned housing to the government (Cao, 1982).
6. Affordable housing is a type of commodity housing with its prices controlled by the state. The price of affordable housing is set in such a way that it can cover its costs and include some profit (*bao ben wei li*). Its profit rate has to be less than 3 per cent. Its costs include costs of land acquisition and compensation, prospecting and designing, construction costs, neighbourhood facility construction costs, management fees, interest on loans and taxes (State Council, 1998). Each developer is required to construct af-

- fordable housing that accounts for at least 20 per cent of their total housing development (State Council, 1994).
7. As far as employers are concerned, an exception is the case of company towns where employers are the main housing providers to their employees. Also, in some European housing systems such as that in the UK, the state provides some public housing.
  8. Job rank, from the lowest to the highest, includes ordinary workers or staff, group or team leader, village cadre, township level cadre, section (*gu*) level cadre, division (*ke*) level cadre, department (*chu*) level cadre and Bureau (*ju*) or higher level cadre.
  9. Work units in China are classified into different ranks based on their importance to the national economy. The rank of work units, from the lowest to the highest, includes village/section (*gu*) level, township/division (*ke*) level, county/department (*chu*), prefecture/bureau (*ju*), province/ministry level (*bu*) and central level (*zhongqiang*).
  10. The *hukou* system is a household registration system in China, which was developed in the 1950s for surveys of the population at that time but later became an important tool for government control (Chen and Seldon, 1994). Some scholars call it 'an internal greencard' system because it is a key institution that defines individual socioeconomic status and opportunities (Chan, 1994). Every Chinese is born with a *hukou* classification and *hukou* location. In terms of *hukou* classification, it divides Chinese into a population with urban *hukou* and a population with rural *hukou*, mainly based on birthplace. And according to *hukou* location, it divides the population into one with local (permanent) *hukou* and the other with non-local (temporary) *hukou*, based on the place of registration. In general, only people with urban and permanent *hukou* qualify for state welfare benefits, such as subsidised housing, free medical care and pension.
  11. Rent for public housing, which used to be only 1–2 per cent of household income in the 1980s and early 1990s, is increasing gradually and is expected to reach 15 per cent of household income in 2000 (State Council, 1994).
  12. In regions where the ratio of housing price (for a 60 square metre affordable housing unit) to household income is larger than 4, the work unit can issue monetary housing subsidies to households with no housing or those whose housing consumption is below the standard set up by the government (State Council, 1998).
  13. The Housing Provident Fund is a long-term housing saving provided by employees and work units to help households to purchase, build or remodel housing. Every employee in state or collective-run enterprises or government agencies is required to save no less than 5 per cent of his/her salary each month into the housing provident fund account. At the same time, his/her work unit will contribute the same amount of money to the account each month. The money in this account belongs to the employee (State Council, 1999).
  14. According to the State Council (1994), employees can enjoy 'job seniority discount' when they purchase public housing. The discount varies. In Beijing, it ranges from 0.6–0.9 per cent for every year of service (Beijing Housing Reform Office, 1996).
  15. In recent years, home-owners in some cities have been allowed to lease part of their housing after they get the permission from the local government. Some renters of public housing also sub-lease their housing in the black market. Yet, there are no private apartment complexes for rent in Chinese cities.
  16. The market price of a housing unit is a price covering all expenses, taxes and profits for the transaction and construction of the unit (Tong and Hays, 1996). The cost price is a subsidised price, only including costs of land acquisition and compensation, complete construction costs, interest on loans and taxes. The standard price, designed to help households with both economic difficulties and a housing problem, is usually set up by the state and is very low.
  17. A flat bought at cost price can be released in the market only after five years and the local government or work unit has a priority to buy or rent it back. In addition, the gains from the transaction must be shared between government/work unit and individual buyer according to their contribution to the original purchase (Ministry of Construction, 1999). Yet it is not known how the resale price will be determined (Tolley, 1991). A flat bought at standard price is not allowed to be resold on the market.
  18. In order to attract investment or boost the housing market, some cities, such as Beijing, Shanghai and Guangzhou, issue a certain number of special household registrations—blue *hukou*—to people who can either invest a large sum of capital or/and buy a unit of commodity housing with certain criteria (such as size) (Bureau of Public Security in Guangzhou, 1998). Yet, even this exception was cancelled in cities that feared a large influx of migrants.
  19. See footnote 15.
  20. Since housing has not been a major research

- focus within China until very recently, housing data in China are limited and scattered. Housing information was not included in the national census until the latest 2000 census, which is not yet available to the public.
21. The survey was conducted by a research team comprising Donald Treiman (University of California, Los Angeles), Andrew Walder (Stanford University) and 10 other academics in the People's University in China. This survey is a national survey with rural and urban as two strata. Only the urban sample is relevant here.
  22. This survey follows Chan's classification of the administrative hierarchy in China. Chan has clarified the relationship between different hierarchies and, in particular, has clearly specified the lowest-level units that should be regarded as urban and rural respectively. According to Chan (1994), county-level units include cities and counties in prefectures and autonomous prefectures, and city districts and counties in prefecture-level and provincial-level cities. Township-level units include towns, townships and streets in county-level units, and the village-level units include residents' committees and village committees.
  23. Two reasons lead to the decision that only county-level units, not the township-level and village-level units, are considered a statistical level in the multilevel analysis. First, the majority of the correlations among observations are occurring at the county level and the variations between township-level units and between village-level units are very small according to the sampling design test (Treiman, 1998). Secondly, households in different residents' committees (village-level units) in the same city share the same housing stock and housing market, from which they exercise their housing choices. There are no factors unique to a residents' committee, which may lead to similar housing behaviour in one residents' committee and different housing behaviour among other residents' committees. In other words, residents' committees do not really have contextual effects on households' housing behaviour and thus they are not considered as a level in the analysis. Similarly, township-level units are not considered as a level. In contrast, there are contextual effects on housing choices in county-level units.
  24. The mean household income is 14 456 yuan with a standard deviation of 46 562 yuan, and the median is 10 000 yuan.
  25. Migrants usually qualify only for temporary subsidised housing such as dorms and offices.

26. In general, households with permanent but rural *hukou* in cities were farmers in previous suburban areas that were converted into urban areas. These households were often able to maintain their owner-occupied housing in cities even during socialist era.
27. Households living in free housing or other types of housing such as dorms and offices (7 per cent of the sample) are excluded from the regression.
28. For logistic regression, the intraclass correlation coefficient is defined as

$$\rho = \frac{\tau_0^2}{\tau_0^2 + \pi^2/3}$$

See Snijders and Bosker (1999).

29. The  $R^2$  is calculated using the formula given in Snijders and Bosker (1999, p. 225)

$$R^2 = \sigma_F^2 / (\sigma_F^2 + \tau_0^2 + \sigma_R^2)$$

where,  $\sigma_F^2$  is the variance of the linear predictor for the dependent variable;  $\tau_0^2$  is the intercept variance; and  $\sigma_R^2$  is the level-one residual variance. According to Snijders and Bosker, this  $R^2$  is usually considerably lower than the OLS  $R^2$  values obtained for predicting continuous outcomes, and a small  $R^2$  can be very meaningful.

30. The explained Level 2 variance by sale price of commodity building is calculated from  $\tau_0^2$  from ANOVA (2.627) and  $\tau_0^2$  from the mean-as-outcome model (2.199). (See Bryk and Raudenbush, 1992, for a definition of these models.)

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