Published in *International Journal of Housing Policy,* V.17, I.4, P. 512-540

# Macro effects on the household formation of China's young adults—demographics, institutional factors, and regional differences

Zhou Yu

AEB 254

Department of Family and Consumer Studies

University of Utah

Salt Lake City, UT 84112

Tel: (801)585-0437

Fax: (801)581-5156

Email: zhou.yu@utah.edu

**Macro effects on the household formation of China's young adults—demographics, institutional factors, and regional differences**

**ABSTRACT**

Household formation, or the extent to which population is transferred into households, determines housing demand and reflects housing wellbeing. Young adults, who are new entrants to the housing market and sensitive to changing market conditions, have faced many challenges in China's fledging housing market. This paper examines trends in household formation from 1982 to 2005 using census data. Then the 2005 One-Percent Population Survey data are used to study macro effects on the household formation patterns of the post 1970 generation (those aged 25-34 in 2005) throughout China. Household formation is measured using both headship and non-family headship rates. In contrast to those in industrialized countries, young adults in China become less likely to form independent households in time of rapid economic growth. When they do, they are more likely to form non-family households than before. Regional variations in household formation can be explained by several macro factors. Marriage rates are positively associated with headship rates, so is gender imbalance. There is a distinct pattern to the formation of non-family households, which reflects increasing mobility, labor migration, delayed marriage, and gender imbalance. Institutional and demographic forces, some of which are unique to China, are important factors in household formation.

**Key Words**: Household formation, headship rates, housing demand, the post 1970 generation, demographics, regional differences, non-family households

## INTRODUCTION

Over the last thirty years, China's real GDP has grown at an average rate of 10% per year and average income has increased by about 10 times (World Bank, 2011). Rapidly rising income has led to a substantial growth in the housing sector especially after urban housing became commercialized in the late 1990s (Liu and Shen, 2005; Nie, 1999). Housing consumption has increased dramatically and private homeownership has soared (Yu, 2006).

Not everyone has benefited from the housing boom. Housing has been used not only for residence in recent years, but also as an investment instrument especially in major cities such as Beijing and Shanghai. This has led to a rapid rise in housing prices in select cities (Wu et al., 2011). While a growing number of people own multiple homes (Huang and Yi, 2011), declining housing affordability has forced many young adults to delay household formation, stay with their parents and roommates, and even congregate in crowded "ant tribes" on the urban fringe of major cities (Lian, 2009).

Household formation is crucial for the overall health of the housing market, because it determines the amount of new housing required and connects population with housing demand. Household formation, measured by headship rates or the percent of population being householders, is also pertinent to the demand for public utilities, child

care facilities, consumer goods and land development (Smith, 1984; Burch, 1995; Pitkin and Masnick, 1987).

Changing demographics has been a special force behind China's emerging housing market. The one child policy initiated in the 1970s and formally implemented in 1979 has delayed marriages, abruptly reduced the birth rate, increased gender imbalance, and curtailed rapid population growth (Riley, 2004; Banister, 1987; Zhao and Chen, 2008; Wang and Yang, 1996; Peng, 2011)[1]. Coupled with internal migration and rapid urbanization, the number of non-family households has increased significantly, reflecting an erosion of traditional living arrangements in urban China (Goldstein, Guo, and Goldstein 1997; Cheung and Yeung 2015). All these demographic events have had significant effects on housing demand in China, but we know very little about these effects.

The so called post 1970 generation (the P70G) is in the forefront of changing demographics. The P70G here refers to those who were born 1970-79 and aged 25-34 in 2005. They are the tail end of China's first postwar babyboom. Similar to the post-war baby boomers in the US and Canada who dominate the demographic landscape, the

[1] Total fertility rate for China decreased from 6 children per woman in 1970 to slightly more than 2 children per woman in 1980 (Poston, 2000; Banister, 1987). As a result of the one child policy, a typical woman also married and gave birth to her first child much later than before.

P70G[2] is one of the largest generations in terms of population size, signifying their importance in the housing markets.

The P70G is large in size and was in their prime age of household formation in 2005. They may have experienced significant demographic pressures in the markets (Yu, 2006; Lian, 2009). The experience is perhaps similar to what the second half of the baby boom generation in the U.S. has been through (Myers, 2004; Myers et al., 2005; Berger, 1989; Easterlin et al., 1993). The large size of the preceding cohort may have crowded out of the younger cohort in the markets. Meanwhile, non-family living has been a particularly important issue for young adults as they become independent in life and enter the housing market for the first time (Waite, Glodscheider, Witsberger, 1986; Smith et al., 1984; Mulder 2006). The rate of household formation they achieve as young adults will help determine the generation's future housing consumption (Myers, 1990; Jiang and Ren, 2005).

Not only is the P70G one of the largest generations in China's history, it also has experienced the full force of economic reform. The P70G has much more freedom in the labor market and in their migration decisions than their predecessors. As a result, the

[2] Although each succeeding cohort has become progressively smaller which may eventually dampen China's overall housing demand, the cohort currently entering China's housing market is still among the largest in history and critical to the health of the housing market.

P70G has seen a big increase in residential mobility, initiated the largest rural-urban migration in human history (Liang, 2001; Zhao and Chen, 2008), and started the phenomenon of "floating population" (Shen and Huang, 2003; Goldstein et al., 1997). However, the *Hukou* status (the household registration system), which is unique to China, has crippled migrants, most of whom are from rural areas (Wu and Treiman, 2004). Meanwhile, people of the P70G who have non-agricultural *Hukou* are no longer eligible for welfare housing and guaranteed jobs as some of their predecessors were. The P70G is also the witness of growing regional disparities in socioeconomic development, even though the central government has repeatedly attempted to reduce the disparities (Wei, 2002; Zhao and Tong, 2000; Chen et al., 2011).

Although there is a rich literature on housing allocation and distribution at the household level and in selected urban areas (e.g., Huang, 2003b; Li, 2003; Jiang, 2006), little is known about how population is translated into households throughout China. The present paper uses census data to examine trends in household formation from 1982 to 2005. Then, China's 2005 One-Percent Population Survey data are used to study the household formation of the P70G at the city level, with a special attention to tastes, economics, demographics, institutional factors, and regional differences.

In the following sections, we will first review housing reform in China and literature on household formation. We will then assess headship rate trends from 1982 to 2005.

Research questions and study approach are discussed in the following section. We will report research findings and discuss relevant policy issues in the end.

## BACKGROUND

### Housing reform and its outcomes

Urban China went through housing reform which started in the early 1980s and plateaued in the late 1990s (Wang and Murie, 1996; Tong and Hays, 1996). The main thrust of the reform was to abolish welfare-oriented housing system, establish market mechanisms in housing distribution, and accelerate housing production in urban areas through market privatization. As a result, private homeownership rates[3] in Chinese cities, such as Shanghai and Beijing, jumped from 20% in 1994 to more than 60% in 2000 (Yu, 2006). Housing has quickly become the largest household expenditure for almost all households (Song et al., 2004).

Housing has also become a major form of investment in recent years, due in part to the lack of alternative investment instruments. Major cities such as Beijing has seen 30% to 70% increase in price-to-rent ratios since the beginning of 2007 (Wu et al., 2011). Parallel to the rapid rise in housing prices, second home ownership has increased

[3] Since the state owns urban land and urban homeowners lease the land from the state, private homeownership in urban areas is not complete. In contrast, the vast majority of houses in rural areas are self-built and privately owned.

dramatically in recent years. A recent estimate shows that more than 15% urban households owned multiple homes[4] in 2007 (Huang and Yi, 2011). Increases in second home ownership have affected housing supply and raised the barrier for new entrants to the housing market, making it more difficult for young people to form independent households and create new families.

While urban housing has largely succeeded its goal of encouraging production and reducing government subsidy, there is evidence of increasing inequality in housing distribution. Occupation and education have become more important factors in housing allocation (Yu, 2006). Housing reform has reinforced inequality existed in the socialist system, giving favors to insiders and urbanites (Logan et al., 1998; Logan et al., 2010). Rural migrants have great difficulty in urban housing and labor markets (Chan and Zhang, 1999; Guo and Iredale, 2004; Wu, 2004).

Whereas the urban housing sector has changed dramatically, rural housing distribution remains largely unchanged. Most houses in rural areas are still self-built and privately owned[5]. Even though per capita housing space has roughly doubled from 1985 to 2005, there are few renters outside major cities (Xie and Zhang, 2009). Rural housing market is

[4] Some of the second homes are used for vacations, while others are rented out for additional income. In the first case, un-occupied homes would be counted as vacant housing units in the census. In the latter case, they would be counted as rental units instead of owner-occupied. Census defines ownership based on the status of the residents in the housing units. If current residents rent the housing units, then they are considered as rental units.

[5] In contrast to urban land which is largely owned by the state and leased by urban homeowners, rural land is collectively owned.

almost nonexistent (Liu, 2006). Furthermore, multi-generation households are more prevalent in rural areas than in urban areas (Wang, 2006). Therefore, lower headship rates should be expected in areas of higher prevalence of rural population, where few individuals are expected to live in non-family households.

**Three sets of explanations**

The literature on household formation has been largely developed in industrialized countries in response to the remarkable changes in the number, size, and composition of households during the post-World War II period (e.g., Kobrin, 1973 ; Miron, 1988). The growth in the number of households had significantly outpaced population growth. The number of people per household had declined while headship rates increased correspondently. The growth rate of non-family households was even more rapid (Pitkin and Masnick, 1987).

It is not surprising that these dramatic changes have garnered much attention from researchers who are concerned with such issues as housing, education, child welfare, and consumer behavior. The key issue is the determinants of household formation and why there has been such a significant increase in the number of independent households in general and non-family households in particular (e.g., Maisel, 1960; Ermisch, 1981; Smith et al., 1984; Miron, 1988; Carliner, 1975; Skaburskis, 1994; Haurin, Hendershot, and Kim 1993).

Researchers have generally offered three sets of explanations for household formation, which are preferences/tastes, family structure/demographics, and economics (Burch and Matthews, 1987). The taste hypothesis presumes that there exists a relatively general taste for "privacy" or "independence." The preferences vary between different population groups, which lead to different headship rates (Pitkin and Masnick, 1987; Pampel, 1983). The demographic hypothesis indicates that population structure, e.g., marriage patterns and fertility, has become more conducive to independent living after the World War II (Burch and Matthews, 1987; Kobrin, 1973). The economics hypothesis treats household status as a composite good. People have to make optimal grouping decisions based on the demand for market goods and labor market conditions (Ermisch, 1981; Carliner, 1975). While researchers disagree about the relative importance of the three sets of explanations, they agree that these explanations are not mutually exclusive from each other (Burch, 1995). For young adults, the formation of non-family households is often considered an intermediate step toward the eventual formation of family households (Waite, Goldscheider and Witsberger, 1986; Mulder, 2006). In non-family households, there is not a family nucleus and household members do not share family ties, i.e., excluding married couples with or without children and excluding single parents with children. However, due to gender imbalance and internal migration, a growing number of young people in China may have no choice but to stay with non-family members (Chueng and Yeung, 2015; Ermisch, 1986).

While much energy has been devoted to industrialized countries where housing markets have matured, few studies have examined household formation in developing countries. Pasha and Lodhi (1994) report that income and education are of little influence on household formation in Pakistan. Rural-urban migration and women working outside households are the primary impetus for the formation of new households. Zhao and Chen (2008) show that political and economic changes have deeply affected household formation in China. Government policies, such as the *Hukou* system and the one child policy, have also had profound effects. Rural-urban migration has in recent decades changed the traditional notion of family life (Waite, Goldscheider and Witsberger, 1986). Available evidence shows that developing countries can be very different from industrialized countries with respect to household formation.

**RESEARCH QUESTIONS**

What missing from the housing literature is an assessment of household formation across China. Building on the discussion above, three sets of questions will be addressed in this paper:

1) To what extent have the headship rates of young adults changed from 1982 to 2005? How different age groups have fared over time?

2) What is the relative importance of economic, demographic, and geographic factors in determining the headship patterns of the P70G at the city level?

3) To what extent are the findings consistent with previous studies which are largely conducted in industrialized countries? What are the implications for future housing demand in China?

**Data:** To address these questions, the analysis will first use census data at the national level and then rely on the recently available Chinese 2005 One-Percent Population Survey microdata[6]. The dataset, which is collected by China's National Bureau of Statistics, is arguably the most comprehensive and up-to-date data source in China, by which household formation throughout the country can be closely investigated.

**Study areas**: This study will cover all cities (or prefectures) in China. 345 cities and prefectures can be individually identified in the 2005 data. These cities and prefectures, which will be called as "cities" in the following sections, include both urban and rural areas, covering all residents in mainland China. Demographic, economic, housing market data are aggregated to the city level. The unit of analysis in this study will be these cities.

**METHODS**

**The dependent variable**: Household formation in this analysis is measured at the city level. The headship rate $hh_{ji}$ for a given age group *j* in city *i* is defined as the number of

[6] The population survey relies on a two-stage sampling approach and covers the whole nation. Enumeration was taken between November 1 and 15, 2005. According to an official report from China's National Bureau of Statistics, there is a 1.72% net undercount of the total population (Feng, 2006). 2005 was also the first time that China's national population survey collects information on personal income—an important factor in household formation.

householders/heads[7] $HH_{ji}$ in age group j per 100 people in the population $POP_j$ in the age group j as defined in the following equation:

$$hh_{ji} = HH_{ji} / POP_{ji}$$

The higher the area's headship rate, the larger the number of households are formed by the P70G in the study city. $hh_{ji}$ will be the dependent variable in the multivariate analysis subsequent to the presentation of descriptive findings.

The multinomial model used in this analysis is specified as follows:

$$hh_{ji} = GEOG + ECON + DEMOG + HOUSEM + INSITU$$

GEOG = geography (1. cities of four tiers; 2. seven major regions in China);

ECON = economic factors (1. median annual personal income (25-34) by city; 2. income (25-34) differentials from city medians by city; 3. percent city population (25-34) not currently employed);

DEMOG= demographic factors (1. percent city population (25-34) being men; 2. percent city population (25-34) currently married; 3. percent city population (25-34) with college education; 4. percent city population (25-34) lived in another province 5 years ago);

[7] Household heads are called *Huzhu* in Chinese. The term "household head" is used both in census counting and in *Hukou* registration.

HOUSEM= housing market characteristics (1. median housing cost of self-built housing by city; 2. median housing size by city; 3. percent housing units rented);

INSITU= institutional factors (1. percent city population (25-34) away from the cities of their *Hukou* registration; 2. percent city population (25-34) with agricultural *Hukou*).

Ordinary linear squares (OLS) method is used in the multivariate analysis. After examining the determinants of headship rates by cities, we will use the same multivariate model to assess the determinants of non-family headship rates [8]. Non-family headship rates refer to the percent of people (25-34) who are heads of non-family households at the city level. As discussed in the previous section, there has been a large increase in non-family headship rates among young adults, even though their overall headship rates have decreased significantly over time.

There are two different approaches regarding modeling household formation (Burch and Matthews 1987; Burch 1995). Economists have largely focused on individuals as the unit of analysis. Household formation is often regarded as an endogenous decision at

[8] Under the definition of National Bureau of Statistics of China, domestic households (jiatinghu) consist of people living under the same housing unit, whether related or not. In this study, a household that consists of only one person is regarded as a non-family household. Non-family households include both collective households (jitihu) and selected domestic households, each of which only has only one person or only unrelated individuals. About 4.7 percent of those aged 25-34 were in collective households (jitihu) in 2005 and about 6.6 percent lived in domestic households that were also non-family households, almost none of them alone.

the individual level (e.g., Börsch-Supan, 1986; Ermisch 1999 ; Haurin, Hendershott, and Kim, 1993). The endogeneity issue makes it empirically difficult to study household formation in a large scale and generate statistically robust models, because researchers have to make “arbitrary assumptions about temporal and causal ordering (Burch 1995).” In the second approach, many national level studies have relied on data at am aggregate level (e.g., Smith 1984; Goldstein, Guo, and Goldstein, 1997; Monkkonen, 2013; Bongaarts, 2001). Ryder (1987) has forcefully advocated for macro-analysis because populations have "manifested in their aggregate behavior something more than the arithmetical summarization of assemblages of evidence about individuals." In this paper, we focus on the factors affecting household formation at the macro level in order to investigate the extent to which the headship patterns reflect the demographic makeup and the economic conditions of different regions.

**HEADSHIP RATE TRENDS**

Headship rate trends in industrialized countries are well documented in the literature. Headship rates have increased substantially in North American and most European countries after the Great Depression and especially during the post-World War II period (Miron, 1988; Keilman, 1988; Kuijsten, 1995; Schwarz, 1987; Maisel, 1960; Kobrin, 1973). That is, as people live separately from their roommates and family members, more households[9] are formed in a given population over time. In Canada and the U.S.,

[9] Households are made up of family households and non-family households. In China, a growing number of domestic households (jiatinghu) have become non-family households.

headship rates among young adults aged 25 to 34 have increased to about 45%. That is to say, nearly half of all young adults are heads of their own households.

While overall headship rates among young adults have been relatively stable in recent decades, non-family headship rates[10] have increased rapidly (Smith et al., 1984; Borsch-Supan, 1986; Haurin et al., 1993). Non-family headship rates for young adults are well above 10% (Smith, 1984; Masnick et al., 2010).

Headship rate trends in China are somewhat distinct from those in industrialized countries. Even though both income and homeownership have increased dramatically in China over the past 30 years, headship rates have not increased to the same extent. In fact, some age groups have experienced unexpected declines in headship rates. (See Figure 1, headship rates in China by age, 1982-2005). The decline is particularly evident from 2000 to 2005, a period of rapid economic growth and growing rural-urban migration.

<Figure 1 about here >

Overall headship rates in China increased from 33.1% in 1982 to 36% in 2005. However, young adults aged 25 to 34 have seen the largest decline of all age groups. Their

[10] Percent of people who are heads in non-family households (households in which the head is not the head of a family, i.e., single-person households or households of unrelated persons). In China, extremely few young adults live in single-person households.

headship rate decreased by 8 percentage points from 37.3% to 29.3% over the same period. As a comparison, their headship rate is well below that of their peers in the U.S. and Canada.

There are also large regional differences in headship rates. Among young adults aged 25 to 34, the average headship rate in tier 1 cities is 7 percentage points higher than that in tier 4 cities. Meanwhile, the rate in East China is 5 points higher than that in the Central region (see Table 1).

<Table 1 about here>

While overall headship rates for young adults aged 25 to 34 have decreased from 1982 to 2005, there has been a strong upward trend in non-family headship rates. In fact, their non-family headship rates have increased by more than 3 percentage points over the same period[11]. The increase in non-family headship rates mirrors the trend in many industrialized countries during the post World War II period, even though they are still far below those in the U.S. and Canada (Smith et al., 1984). (See Figure 2, non-family headship rates in China by age, 1982-2005).

<Figure 2 about here>

[11] In contrast, family headship rates for the age group have decreased by 11.3 percentage points from 35.4 percent to 24.1 for the same period.

In summary, the headship trends in China are remarkable. Despite rapid economic growth and large increases in income, the headship rates of young adults have declined. Young adults in China are more likely to from their own households in a non-family setting rather than to be sub-members of family households. There has also been a large increase in the formation of non-family households, in light of the large scale of rural and urban migration and a substantial run up in housing construction and housing prices in major cities. The diverging trajectories of overall household formation and non-family household formation deserve more scrutiny. So what are the determinants of household formation?

## EFFECTS ON HOUSEHOLD FORMATION PATTERNS

The literature has identified several factors affecting household formation.

**Income and employment**: The first and perhaps most widely held proposition is that household formation is directly linked to real income (Michael et al., 1980; Smith et al., 1984). There is a cost associated with separate living or forming independent households. People will not be able to share public household goods with other household members when they live alone or in a small household. With growing income, people are more able to increase the rate of household formation. Both longitudinal and cross-sectional study at the individual level have confirmed the importance of income in the probability of people to form independent households (Haurin et al., 1997; Burch and Matthews, 1987; Hickman, 1974; Miron, 1988). Across all

age groups, income elasticity seems to be the largest among young adults (Smith et al., 1984). This is not surprising given that most young adults are new entrants to the housing and labor markets.

There are large variations in income and living standards among Chinese cities. When young adults make decisions whether to form independent households, they have to compete with other people in the same housing market and consider their income level in a relative term. Therefore, we hypothesize that the larger the income gap between young adults and the city median level, the lower the rates of headship among young adults.

Low unemployment rates allow people to have stable income and help enhance the sense of security. Labor market behavior partially explains the differences in household formation between European countries (Blanco and Kluve, 2002; Mandic, 2008). Since social safety nets are still underdeveloped in China, unemployment may be a potent factor deterring household formation.

Women's labor force participation gives more freedom to women outside traditional households (Pasha and Lodhi, 1994). It also provides a second income to increase the affordability of housing for married households, and facilitate household formation for female headed non-family households (Smith et al., 1984). However, unemployment rates are highly correlated with women labor force participation rates in China and labor

participation rates between the two genders are also highly correlated. In other words, cities with low unemployment rates also have high rates of women labor force participation. Therefore, the two variables cannot be included in the multivariate models at the same time. In this analysis, we will use unemployment rates as a proxy for women's labor force participation rates. We hypothesize that cities with higher share of women working should have higher headship rates and higher non-family headship rates. Because the formation of non-family households is likely a result of increasing mobility and delayed marriage, income and employment should not be strongly associated with the formation of non-family households.

**Demographics**: Demographics are linked to household formation (Pitkin and Masnick, 1987; Pampel, 1983). The concept of life-cycle is central to the explanation of why households and families are formed and dissolved and the extent to which housing demand changes through life-cycle stages (Sweet, 1990).

The transition into adulthood is a critical stage for household formation, when headship rates increase significantly. However, there are large differences between China and industrialized countries. In most European and North American countries, leaving the parent homes often signifies the transition to adulthood (Sobotka and Toulemon, 2009; Blanco and Kluve, 2002). Therefore, headship rates increase rapidly in early adulthood. On the other hand, the effect of marital status on headship rates is often ambivalent. Married couples are more likely to form independent households than the unmarried.

However, married partners form households jointly, which constrains their prospects for individual headship. Studies have shown that marriage rates are negatively, albeit weakly, associated with headship rates among young adults in the U.S. (Yu and Myers, 2010; Kobrin, 1973).

In contrast, adulthood in China often begins with marriage. For those who are not labor migrants, marriage is often the triggering event of leaving a parental home and establishing a separate living quarter (Hajnal, 1982). Young adults in China tend to leave their parental homes later and have significantly lower headship rates than their counterparts in industrialized countries (Yi et al., 1994). The trend has been reinforced in recent decades by China's population policy which advocates delayed marriage. Since marriage is central to adulthood transition in China and housing option is rather limited for premarital youth, marriage rates should be positively linked to headship rates at the city level. Meanwhile, marriage rates should be negatively associated with non-family headship rates. This is because, once married, most couples will form traditional family households.

The marriage variable in this analysis is defined as the percent of young adults aged 25 to 34 in each city that is currently married. The higher the percent, the larger share of

the study population in each area that is married. While cohabitation has increased in urban China, it is still very rare[12].

Another demographic factor which has not been tested in previous studies is gender imbalance. Due in part to the one child policy, gender imbalance is evident to a varying degree in Chinese cities. While gender imbalance makes it more difficult for young men to find spouses, the effect on headship rates is not obvious. On the one hand, men who could not find spouses may extend their stay with parents and delay household formation. Studies in Euroepan countries show that men are more like to stay in parental homes than women across Europe (Blanco and Kluve, 2002; Mandic, 2008). On the other, they could choose to leave parental homes before marriage and therefore increase headship rates. Among young adults, more men than women have migrated to cities and increased gender imbalance there. Migration tends to increase headship rates in destination cities. So the effect of gender imbalance on headship rates is not apparent. To measure gender imbalance, we use percent young adults aged 25 to 34 who are men in each city. The higher the share away from 50%, the greater the gender imbalance.

We also include percent young adults aged 25 to 34 who have college education and percent lived in another province five years ago to control for education and migration

[12] There is little legal protection for unmarried cohabitation in China. In fact, unmarried cohabitation was considered illegal not long ago and is still regarded as morally reprehensible for most people (Wang, 2007).

respectively. Young adults with higher levels of education have greater earning capacity and higher permanent income, which are positive to household formation. Past research has shown that the educated are more likely to live independently and having higher mobility (Yu and Myers, 2010; Skaburskis, 1994; Michael et al., 1980). Migrants are found to have higher headship rates, because they have to split households (Zhao and Chen, 2008). Therefore, education and migration should be positively linked to both overall and non-family headship rates.

**Housing market conditions**: In recent years, researchers have recognized the importance of housing prices and housing affordability in the decision of household formation (Ermisch, 1999; Borsch-Supan, 1986). Young people are particularly sensitive to housing prices in their decision to leave parental homes and live independently (Ermisch and Di Salvo, 1997; Haurin et al., 1993; Hughes, 2003; Smith et al., 1984). Rising housing prices and declining housing affordability have led to a slight decline in household formation over the last decade in the U.S., reversing a long time trend of rising headship rates (Yu and Myers, 2010). We expect that young people in cities of higher housing prices will have lower headship rates. The literature shows that the effect of housing prices on the formation of non-family household is not conclusive (Yu and Myers, 2010; Kuijsten, 1995). Since many cities have almost no commercial housing, we use the median cost of self-built housing in each city as a proxy measure for housing cost.

Cities with larger housing size and more self-built housing[13] should have lower headship rates because they tend to be more rural and less developed. The prevalence of self-built housing is highly correlated with the relative size of the agricultural sector in each city. In addition, a larger space can accommodate more people and reduce the need to set up separate living quarters.

Renting may be a more affordable option than homeownership for young adults to form independent households. With the rapid rise in homeownership, there is a lack of rental units in many cities. Therefore, we hypothesize that young adults will have higher headship rates in cities with a larger share of rental units. Non-family headship rates should also be higher, since most non-family households prefer rental housing.

**Institutional factors:** One factor not present in industrialized countries is *Hukou* or the household registration system, which has played a critical role in creating a hierarchy of urban places and favoring cities over the countryside (Cheng and Selden, 1994). The system has restricted mobility and limited the opportunities of rural migrants in cities (Alexander and Chan, 2004). Whereas there have been many attempts to reform the system and make it less restrictive, *Hukou* status remains an important determinant of housing consumptions and life opportunities (Huang, 2003a; Chan and Zhang, 1999; Guo and Iredale, 2004). The effect is particularly apparent for rural migrants, given that they have very limited opportunities for housing and public services in major cities.

[13] Self-built housing tends to be low cost in comparison with commodity housing in urban areas.

There are two aspects in the *Hukou* status which are relevant to household formation. One is that whether one has agricultural *Hukou* or non-agricultural *Hukou.* Almost all non-agricultural *Hukou* holders live in urban areas. Research shows that young urbanites are much more likely to leave parental homes in 2000 than those in rural areas (Wang, 2006). Urbanization increases household formation since homes in cities tend to be small and cannot easily accommodate multiple generations. Urban residents tend to have lower fertility rates, which lead to smaller family size and higher headship rates (Schwarz, 1987; Zhao and Chen, 2008). A larger share of agricultural *Hukou* in a city reflects the agricultural status of the city, which tend to be associated with lower headship rates (Goldstein et al., 1997; Zhao and Chen, 2008). So cities with a larger share of young adults with agricultural *Hukou* are expected to have lower headship rates.

Second, we can measure mobility by looking at whether an individual still stays in the household in which his/her *Hukou* was originally registered. *Hukou* is often linked to a specific housing unit or work unit. When individuals move away from the original households in which they were registered, they are supposed to move *Hukou* with them. However, moving *Hukou* is often a very cumbersome process and most people do not move their *Hukou* registration with them (Chan and Zhang, 1999). This phenomenon is often referred to as "Residence and *Hukou* Detachment" (Ren Hu Fen Li). The cases of residence and *Hukou* detachment have increased dramatically during the years of

economic liberalization. We expect to see that the higher the rates of the detachment, the higher the level of residential mobility in each city. Moreover, moving often results in a dispersal of family members making it more costly and difficult for family members to live in one household unit (Burch and Matthews, 1987; Rossi, 1955). Uncertainties associated with migration may also be conducive to sharing the households with non-family members. Therefore, the share of the young adults who are detached from their original *Hukou* registration should be positively linked to both headship and non-family headship rates.

**Regional differences**: Another line of explanation in the literature about household formation focuses on taste or preference for privacy. Researchers have argued that people have become more interested in privacy over time and would like to live separately from their parents and friends as economy improves. China should expect to see the same trend if not the same magnitude for the appreciation of privacy. Preference for privacy may help explain regional differences in household formation. Coastal cities and cities with large non-agricultural population should have higher headship rates. Young adults in these cities are also more exposed to industrialized countries and have similar lifestyles. Therefore, we expect young adults in tier 1 cities and in coastal cities have higher headship rates. In this analysis, cities will be grouped into four different tiers based on their housing market activities and economic output. In addition, cities will be separately grouped into seven contiguous regions according to the literature and common practice (Yang, 1997; Zhou et al., 2001).

There are growing disparities in income levels and housing prices among cities and regions. While tier1 cities[14] have seen dramatic increases in housing prices after housing reform in the late 1990s, housing prices in tier 2 and 3 cities have been relatively stable (Wu et al., 2011). Although high prices of housing in tier 1 cities and costal areas are likely to dampen headship rates, people in these areas may be more exposed to urban lifesytles and have greater preferences for privacy and independent living.

Table 2 reports the sumary statistics of the sample. It shows that young adults aged 25 to 34 on average have a headship rate of 29.4%. In other words, 29.4% of the study group are heads of households. 5.2% are heads of non-family households. The vast majority of the study group live outside the top three tier cities. East China has the largest population or 28.8% of the study population, while only 7.9% young adults live in the Northwest.

The median annual income for young adults is RMB 6,622 or about USD$906 using the foreign currency exchange rate in 2005. On average, their income level is about RMB 600 below the city median. About 13.6% of the study group are not currently employed. About 51% of the sample are men, while 86% are married. Only 11% of the sample have

[14] Tier 1 cities include Beijing, Tianjin, Shanghai, Chongqing, Guangzhou, and Shenzhen.

some kind of college education, while 6% lived in another province 5 years ago. On average, 77% of women aged 25 to 34 are working. The rate is 15 percent points lower than that of men.

The vast majority of the housing stock is self-built, which is consistent with the fact that most people in China live outside urban areas. The median cost of self-built housing is RMB 17,316 or USD$2,139. The median housing size is 72 square meters. 70.4% have agricultural *Hukou*, while 14.2% are away from the original cities of their *Hukou* registration.

The summary statistics shows that income levels vary greatly between cities and marriage rates are very high. More than 85% of the sample is currently married. Moreover, the vast majority of the study population still has agricultural *Hukou*, even though some of them are no longer engaged in agricultural activities. The high share of agricultural *Hukou* among young adults shows that it is difficult for rural migrants to obtain non-agricultural *Hukou* and become urbanites. Finally, residential mobility or the prevalence of residence and *Hukou* detachment varies greatly among cities. Young adults in tier1 cities and on the East Coast tend to have the highest mobility rate.

**MULTIVARIATE RESULTS**

As mentioned briefly earlier, the empirical approach in this analysis is to estimate linear regression models to determine factors behind household formation patterns at the city level. In both models, we include several sets of control variables which are geography (models I, II, and III), economic factors (model IV), demographics (model V), housing market conditions (model VI), and institutional factors (model VII). In the end, we will include all these control variables in the full model (model VIII). Regression results are weighted by city population size.

<Table 3 about here>

Model I shows that there are large differences in headship rates among the four tiers of cities. Even though tier 1 cities may have high housing prices, they have the highest headship rates. Tier 4 cities on average have headship rates 7 points lower than tier 1 cities. According to Model II, the East and the North have the highest headship rates. Both tier 1 cities and the East are relatively more developed. When we combine the two sets of geography together, regional differences only slightly moderate (See Model III).

Model IV reveals that employment and personal income have a positive effect, while percent not employed and income gap are negatively linked to headship. These results are originally expected.

Model V indicates that gender imbalance, marriage rates, education, and migration are all positively associated with headship rates. Evidently, 1 percent point increase in percent men and percent married at the city level will lead to 1 and 0.44 percent point increase in headship rates among young adults respectively.

Model VI reports that housing cost and housing size are negatively linked to household formation, while the availability of rental units has a positive effect.

Model VII shows that residence and *Hukou* detachment is strongly associated with household formation, while agricultural *Hukou* is not statistically significant.

Model VIII is the full model, including all the factors discussed above as independent variables. While several independent variables are no longer statistically significant, the high value of adjusted R-squared indicates the strong predicting power of the full model. In other words, about 70% of the variance in the dependent variable can be predicted by the independent variables.

The results largely mirror those in previous models, with some notable exceptions. First, after controlling for other variables, regional differences in headship rates have largely disappeared. Cities in the North and Northeast have slightly lower headship rates. This finding only provides limited support for the taste hypothesis. Second, employment, education, and migration are no longer statistically significant in the full model. Perhaps,

educated young adults are largely concentrated in tier 1 cities and in the East. Migration is also more prevalent in those areas, so is gender imbalance. When included in the full model, these factors may have counteracted with each other. Meanwhile, income, income gap, gender imbalance, marriage rates, housing market variables are all statistically significant. Results support for the economic and demographic hypotheses in explaining headship differences across cities. Surprisingly, the institutional factors are no longer statistically significant in the full model. Perhaps, the *Hukou* status is reflected in income, income gap, and educational attainment. When all factors are included in the full model, the role of the *Hukou* status is no longer apparent. Perhaps, institutional barriers have become less important for household formation.

<Table 4 about here>

As discussed before, the rate of non-family household formation has increased from 1998 to 2005 despite the decrease in overall headship rates among young adults. That is to say, fewer young people form independent households, and, when they do, they are much more likely to be in non-family households. Table 4 presents the estimates for macro effects on non-family headship rates at the city level.

What are the major findings? First, large regional differences have nearly disappeared in the full model. Second, there are regional differences in non-family headship rates. The East and the South have the highest rates, while the North—a relatively less developed

region in China—has lower rates. Again, the result shows a limited support for the taste hypothesis. Third, income, income gap, and employment are no longer statistically significant in the full model, revealing that economic factors are perhaps less important in the formation of non-family households. Forth, not surprisingly, marriage rates are negatively associated with non-family household formation, while the relative importance is lessened in the full model. Fifth, education and migration remain relatively strong predictors of non-family headship rates. Young adults are more likely to form non-family households in place where they are educated and mobile. Sixth, median housing size, housing cost, and the availability of rental units are not statistically significant in the full model, suggesting that young adults in non-family households may be in a transitional stage. Where there are more rental units, they are more likely to form non-family households. Finally, residence and *Hukou* detachment, another indicator of mobility, is positively associated with non-family headship rates, while percent agricultural *Hukou* is not significant.

In summary, regional differences in headship rates and non-family headship rates can be largely explained by the macro factors in the full models. Economic factors and housing market conditions affect household formation, but not non-family household formation. Demographics are a strong predictor. Institutional factors perhaps correlated with other control variables in the full model are also important determinants. The high R-square values in the full models show they explain the variability of the response data well.

Employment is not significant in the full models. As discussed in previous section, women labor force participation is highly correlated with the employment rate by cities. The result is very different from that of Pakistan in which women labor force participation was key to the increased rates of household formation (Pasha and Lodhi, 1994).

**CONCLUSIONS**

Household formation among young adults reflects their housing wellbeing and determines future housing demand. As China improves its economy, there has been a growing demand for housing. However, economic prosperity has not benefited everyone. Young adults or the post 1970 generation have faced many challenges in their path to forming independent households. The headship rates have declined among young adults in recent years. If the trend persists, the P70G will not only have lower housing attainment than their predecessors but also keep the deficit into the future. In contrast, non-family headship is rising, which is a result of delayed marriage and increased mobility among young adults. As China becomes more urbanized and less restrictive on migration, the trend of rising non-family household formation is likely to continue.

In this paper, we look at trends in household formation over time and examine the macro effects on household formation at the city level. While the cross-sectional analysis does not provide a view of the effect of temporal changes on declining headship rates among young adults, five conclusions are suggested by the analysis.

First, geographic differences in household formation are significant, but they can be largely explained by the differences in housing market conditions, socioeconomic factors and demographics. Despite high housing prices, coastal cities and tier 1 cities still have the highest headship rates. If the geographic differences are a proxy for cultural preferences or tastes, results here only provide weak support for this hypothesis.

Second, economic factors and housing market conditions are important household formation in China. This should not be a surprise given that the market economy in China is gradually maturing. Rising housing cost and increasing income gap may be responsible for the decline in the headship rates among young adults. Results here provide moderate support for the economics hypothesis.

Third, perhaps the most interesting findings are about the role of demographics and institutional factors. Gender imbalance is strongly associated with both overall and non-family headship rates. Unlike young men in Europe who are more likely to stay with parents than young women, many “surplus” young men in China are leaving their families and staying in non-family households. Those who live in collective households

are most likely labor migrants to cities. Furthermore, young adults who have high levels of education and who moved across provinces are the primary candidates for non-family households.

Fourth, marriage rates have a strong and positive link to household formation, but a weak and negative association with non-family household formation. This result is different from the literature based in industrialized countries. Marriages remain an important milestone for the transition into adulthood in China. While it is difficult to ascertain the causal relationship between marriage and household formation, results here provide strong support for the demographic explanation of household formation in China.

Fifth*, Hukou* is still an important determinant of household formation. Residential mobility encourages household formation. Consistent with the literature, migration is positively linked to household formation. Young adults in rural areas are more likely to stay with their families than to be independent.

If the policy priority is to support household formation among young adults, the government needs to help young adults increase income and to relax its population policy that discourages early marriages. Another way is to increase the supply of affordable rental housing by regularizing the rental sector in cities and facilitating home

owners to rent out their homes. Meanwhile, the government needs to prepare for the steady growth in the number of non-family households in cities.

Future research ought to examine household formation through a longitudinal framework and explain why headship rates among young adults have declined from 2000 to 2005, which coincided with a period of rapid economic growth in China. When feasible, future research should also study household formation at the individual level and look at the extent to which the results are different. Finally, future research should examine the role of speculative behavior in China's emerging housing market and the extent to which it has squeezed the housing demand of young adults.

**References**:

Alexander P and Chan A. (2004) Does China have an apartheid pass system? *Journal of Ethnic and Migration Studies* 30(4): 609-629.

Banister J. (1987) *China's changing population,* Stanford, Calif.: Stanford University Press.

Berger M. (1989) Demographic Cycles, Cohort Size, and Earnings. *Demography* 26(2): 311-321.

Blanco A and Kluve J. (2002) Why not Stay Home: Nest-leaving Behavior in Western Europe. Berkeley: University of California, Berkeley.

Borsch-Supan A. (1986) Household formation, housing prices, and public policy impacts. *Journal of Public Economics* 30(2): 145-164.

Burch TK and Matthews BJ. (1987) Household Formation in Developed Societies. *Population and Development Review* 13(3): 495-511.

Burch TK. (1995) Theories of Household Formation: Progress and Challenges. In *Household Demography and Household Modeling*, ed. E. van Imhoff; A. Kuijsten; P. Hooimeijer; and L. van Wissen, 85-108. Boston, MA: Springer US.

Carliner G. (1975) Determinants of household headship. *Journal of Marriage and the Family* 37(1): 28-38.

Chan KW and Zhang L. (1999) The *Hukou* System and Rural-Urban Migration in China: Processes and Changes. *The China quarterly* 160(1): 818-855.

Chen J, Guo F and Wu Y. (2011) One decade of urban housing reform in China: Urban housing price dynamics and the role of migration and urbanization, 1995-2005. *Habitat International* 35(1): 1-8.

Cheung A.K.-L. and W.-J.J. Yeung. (2015). Temporal-spatial patterns of one-person households in China, 1982-2005. *Demographic Research* 32:1209-1238.

Cheng T and Selden M. (1994) The origins and social consequences of China's hukou system. *China Quarterly* 139: 644-668.

Easterlin RA, Schaeffer CM and Macunovich DJ. (1993) Will the Baby Boomers Be Less Well Off Than Their Parents? Income, Wealth, and Family Circumstances Over the Life Cycle in the United States. *Population and Development Review* 19(3): 497-521.

Ermisch JF. (1981) An Economic Theory of Household Formation: Theory and Evidence from the General Household Survey. *Scottish Journal of Political Economy* 28(1): 1-19.

Ermisch JF. (1999) Prices, parents, and young people's household formation. *Journal of Urban Economics* 45(1): 47-71.

Ermisch JF and Di Salvo P. (1997) The Economic Determinants of Young People's Household Formation *Economica* 64(256): 627-644.

Feng N. (2006) Lessons Learnt From the 2005 One-percent Population Survey of China and Initial Plans for 2010 Round of Census. *The 11th Meeting of the Heads of National Statistical Offices of East Asia Countries.* Tokyo, Japan.

Goldstein A, Guo Z and Goldstein S. (1997) The relation of migration to changing household headship patterns in China, 1982-1987. *Population Studies-a Journal of Demography* 51(1): 75-84.

Guo F and Iredale R. (2004) The impact of Hukou status on migrants' employment: findings from the 1997 Beijing Migrant Census. *International migration review* 38(2): 709-722.

Hajnal J. (1982) Two kinds of preindustrial household formation system. *Population and Development Review* 8(3): 449-494.

Haurin DR, Hendershott PH and Kim D. (1993) The Impact of Real Rents and Wages on Household Formation. *Review of economics and statistics* 75(2): 284-293.

Haurin RJ, Haurin D, Hendershott P, et al. (1997) Home or Alone: The Costs of Independent Living for Youth. *Social Science Research* 26(2): 135-152.

Hickman BG. (1974) What became of the building cycle? In: David PA and Reder MW (eds) *Nations and households in economic growth: Essays in honor of Moses Abramovitz.* New York: 291-314.

Huang Y. (2003a) Renters' Housing Behaviour in Transitional Urban China. *Housing Studies* 18(1): 103-125.

Huang Y. (2003b) A room of one's own: housing consumption and residential crowding in transitional urban China. *Environment and Planning A* 35(4): 591-614.

Huang Y and Yi C. (2011) Second Home Ownership in Transitional Urban China. *Housing Studies* 26(3): 423-447

Hughes ME. (2003) Home economics: Metropolitan labor and housing markets and domestic arrangements in young adulthood. *Social Forces* 81(4): 1399-1429.

Jiang L. (2006) Living conditions of the floating population in urban China. *Housing Studies* 21(5): 719-744.

Jiang L and Ren Q. (2005) Chinese Population, Household, and Furture Housing Demand. *Market and Demographic Analysis (in Chinese)* 11(2): 20-29.

Keilman N. (1988) Recent trends in family and household composition in Europe. *European Journal of Population/Revue européenne de Démographie* 3(3): 297-325.

Kobrin FE. (1973) Household Headship and Its Changes in the United States, 1940-1960, 1970. *Journal of the American Statistical Association* 68(344): 793-800.

Kuijsten A. (1995) Recent trends in household and family structures in Europe: an overview. In: Imhoff E, Kuijsten A, Hooimeiger P, et al. (eds) *Household demography and household modeling.* New York: Plenum Press, 53-79.

Li S-M. (2003) Housing Tenure and Residential Mobility In Urban China: A Study of Commodity Housing Development in Beijing and Guangzhou. *Urban Affairs Review* 38(4): 510-534.

Lian S. (2009) *Yi zu : da xue bi ye sheng ju ju cun shi lu (Ant tribes: a documentary of college graduates living in crowded suburban villiages),* Guilin: Guangxi shi fan da xue chu ban she (Guangxi Normal University Press).

Liang Z. (2001) The age of migration in China. *Population and Development Review* 27(3): 499-524.

Liu H and Shen Y. (2005) Housing Prices and General Economic Conditions An Analysis of Chinese New Dwelling Market. *Tsinghua Science and Technology* 10(3): 334-343.

Liu R. (2006) Rural Housing Ownwership and Policy Recommendations (Nong Cong Zhu Fang Chan Quan Liu Zhuan De Ping Jing Ji Zheng Ce Jian Yi). *Agricultural Economics (Nong Cun Jing Ji)* 3: 33-36.

Logan JR, Bian F and Bian Y. (1998) Tradition and Change in the Urban Chinese Family: The Case of Living Arrangements. *Social Forces* 76(3): 851-882.

Logan JR, Fang Y and Zhang Z. (2010) The Winners in China's Urban Housing Reform *Housing Studies* 25(1): 101 - 117

Maisel SJ. (1960) Changes in the Rate and Components of Household Formation. *Journal of the American Statistical Association* 55(290): 268-283.

Mandic S. (2008) Home-leaving and its structural determinants in Western and Eastern Europe: An exploratory study. *Housing Studies* 23(4): 615-637.

Masnick G, McCue D and Belky ES. (2010) Updated 2010-2020 Household and New Home Demand Projections.

Michael RT, Fuchs VR and Scott SR. (1980) Changes in the Propensity to Live Alone : 1950-1976. *Demography* 17(1): 39-56.

Miron JR. (1988) *Housing in postwar Canada : demographic change, household formation, and housing demand,* Kingston, [Ont.]: McGill-Queen's University Press.

Myers D. (1990) *Housing demography : linking demographic structure and housing markets,* Madison, Wis.: University of Wisconsin Press.

Myers D. (2004) *Cohorts and Socioeconomic Progress,* New York City and Washington, DC: Russell Sage Foundation and Population Reference Bureau.

Myers D, Painter G, Yu Z, et al. (2005) Regional Disparities in Homeownership Trajectories: Impacts of Affordability, New Construction, and Immigration *Housing Policy Debate* 16(1): 53-83.

Nie M-s. (1999) Current Situation and Development of the Housing Construction in China.

Pampel FC. (1983) Changes in the Propensity to Live Alone: Evidence from Consecutive Cross-sectional Surveys, 1960-1976. *Demography* 20: 443-448.

Pasha HA and Lodhi A. (1994) Determinants of Household Formation in a Third World Setting. *Urban Studies* 31(6): 947.

Peng Xizhe. (2011) "China's Demographic History and Future Challenges." *Science* 333 (6042):581-587.

Pitkin JR and Masnick GS. (1987) The relationship between heads and non-heads in the household population: An extension of the headship rate method. In: Bongaarts J, Burch T and Wachter K (eds) *Family Demography: Methods and their Applications.* Oxford: Clarendon Press, 309-326.

Poston DL. (2000) Social and economic development and the fertility transitions in mainland China and Taiwan. *Population and Development Review* 26: 40-60.

Riley NE. (2004) China's population: New trends and challenges. *Population Bulletin* 59(2).

Rossi PH. (1955) *Why families move,* Beverly Hills: Sage Publications.

Ryder NB. (1987) Reconsideration of a Model of Family Demography. In: Bongaarts J, Burch TK and Wachter KW (eds) *Family demography : methods and their application.* Oxford Oxfordshire; New York: Clarendon Press; Oxford University Press, 102-122.

Schwarz K. (1987) Household trends in Europe after World War II. In: Keilman N, Kuijsten A and Vossen A (eds) *Modelling household formation and dissolution.* Oxford: Clarendon, 67-84.

Shen J and Huang Y. (2003) The working and living space of the "floating population" in China. *Asia Pacific Viewpoint* 44(1): 51-62.

Skaburskis A. (1994) Determinants of Canadian Headship Rates. *Urban Studies* 31(8): 1377-1390.

Smith LB. (1984) Household Headship Rates, Household Formation, and Housing Demand in Canada. *Land Economics* 60(2): 180-188.

Smith LB, Rosen KT, Markandya A, et al. (1984) The Demand for Housing, Household Headship Rates, and Household Formation: An International Analysis. *Urban Studies* 21(4): 407-414.

Sobotka T and Toulemon L. (2009) Changing family and partnership behavior: Common trends and persistent diversity across Europe. In: Frejka T (ed) *Childbearing trends and policies in Europe.* Books on Demand Gmbh.

Song S, Chu G and Chen X. (2004) Housing investment and consumption in urban China. *Urbanization and Social Welfare in China*: 87-106.

Sweet JA. (1990) Changes in the Life-Cycle Composition of the United States Population and the Demand of Housing. In: Myers D (ed) *Housing Demography: Linking Demographic Structure and Housing Markets.* Madison, WI: University of Wisconsin Press, 35-61.

Tong ZY and Hays RA. (1996) The Transformation of the Urban Housing System in China. *Urban Affairs Review* 31(5): 625-658.

Wang AY. (2007) Unmarried Cohabitation: What Can We Learn From a Comparison Between the United States and China. *Fam. LQ* 41: 197.

Wang Y. (2006) Living Arrangement and Household Structure in Urban and Rural China (Dang Dai Zhong Guo Cheng Xiang Jia Ting Jie Gou Bian Dong Bi Jiao). *Society (She Hui)* 26(3): 118-131.

Wang YP and Murie A. (1996) The Process of Commercialisation of Urban Housing in China. *Urban Studies* 33(6): 971-990.

Waite LJ, Goldscheider FK and Witsberger C. (1986) Nonfamily living and the erosion of traditional family orientations among young adults. *American Sociological Review* 51 (4):541-554.

Wei YD. (2002) Multiscale and Multimechanisms of Regional Inequality in China: implications for regional policy. *Journal of Contemporary China* 11(30): 109-124.

World Bank. (2011) China Data and Statistics. *A World Bank Country Study.* Washington, D.C.: World Bank.

Wu J, Gyourko J and Deng Y. (2011) Evaluating conditions in major Chinese housing markets. *Regional Science and Urban Economics*.

Wu W. (2004) Sources of migrant housing disadvantage in urban China. *Environment and Planning A* 36(7): 1285-1304.

Wu X and Treiman DJ. (2004) The household registration system and social stratification in China: 1955-1996. *Demography* 41(2): 363-384.

Xie N and Zhang H. (2009) Rural Housing Consumption in China (Xin Shi Qi Zhong Guo Nong Cun Zhu Fang Xiao Fei Zhuang Kuang). *China Real Estate (Zhong Guo Fang Di Chan)* 3: 13-17.

Yang DL. (1997) *Beyond Beijing : liberalization and the regions in China,* London ; New York: Routledge.

Yi Z, Coale A, Choe MK, et al. (1994) Leaving the Parental Home: Census-Based Estimates for China, Japan, South Korea, United States, France, and Sweden. *Population Studies* 48(1): 65-80.

Yu Z. (2006) Heterogeneity and dynamics in China's emerging urban housing market: two sides of a success story in the late 1990s. *Habitat International* 30(2): 277-304.

Yu Z and Myers D. (2010) Misleading Comparisons of Homeownership Rates When the Variable Effect of Household Formation is Ignored: Explaining Rising Homeownership and the Homeownership Gap between Blacks and Asians. *Urban Studies* 47(12): 2615-2640.

Zhao SXB and Tong SP. (2000) Unequal Economic Development in China: Spatial Disparities and Regional Policy Reconsideration, 1985-1995. *Regional Studies* 34(6): 549-561.

Zhao Z and Chen W. (2008) Changes in household formation and composition in China since the mid-twentieth century. *Journal of Population Research* 25(3): 267-286.

Zhou Y, Zhang L and Wu Y. (2001) Study of China's Urban Centrality Hierarchy (in Chinese). *Areal Research and Development* 20(4): 157-173.

**Figure 1. Headship rates by age groups in China, 1982-2005**

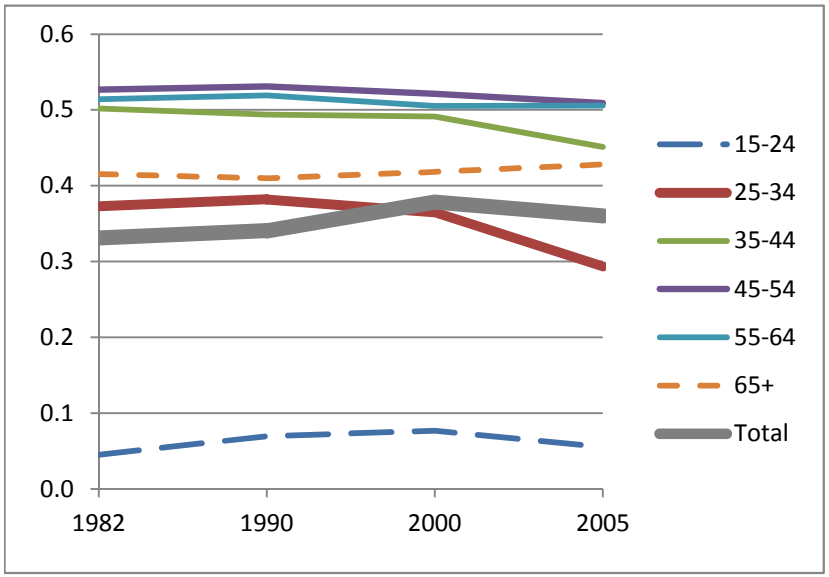


**Figure 2. Non-family headship rates by age groups in China, 1982-2005**

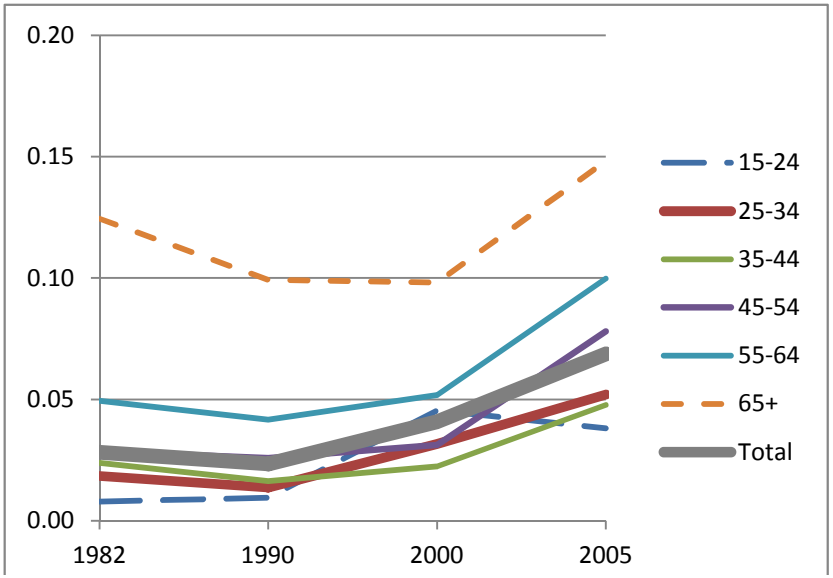

**Table 1. Headship and nonfamily headship rates for adults aged 25 to 34 by geography, 2005**

| | # obs | Headship Rates | Nonfamily Headship Rates | Ratio of Non-family to Overall Headship Rates |
|---|---|---|---|---|
| Tier 1 cities | 6 | 35.6 | 14.5 | 40.8 |
| Tier 2 cities | 19 | 30.9 | 7.9 | 25.6 |
| Tier 3 cities | 23 | 29.3 | 6.7 | 22.9 |
| Tier 4 cities | 297 | 28.6 | 3.8 | 13.3 |
| **Total** | **345** | | | |
| | | | | |
| East | 80 | 30.7 | 6.0 | 19.4 |
| South | 38 | 27.9 | 9.8 | 35.2 |
| Central | 45 | 26.0 | 3.2 | 12.3 |
| North | 38 | 31.3 | 4.4 | 14.2 |
| Northwest | 52 | 28.3 | 3.7 | 13.0 |
| Southwest | 56 | 30.1 | 4.2 | 13.9 |
| Northeast | 36 | 29.7 | 3.7 | 12.4 |
| **Total** | **345** | | | |

Note: results are weighted by city population size.

**Table 2. Summary statistics for adults aged 25 to 34, 2005**

| # Obs. | **345** | |
|---|---|---|
| | Mean | Std. Dev. |
| Headship rate (percent people who are household heads) | 29.3 | 5.3 |
| Non-family headship rate (percent people who are household heads in nonfamily households) | 5.2 | 4.3 |
| Ratio of Non-family to Overall Headship Rates | 17.0 | 11.6 |
| **Geography** | | |
| Tier 1 cities | 6.8 | 25.3 |
| Tier 2 cities | 9.8 | 29.8 |
| Tier 3 cities | 8.8 | 28.4 |
| Tier 4 cities | 74.6 | 43.6 |
| **Total** | **100.0** | |
| East | 28.8 | 45.4 |
| South | 12.7 | 33.3 |
| Central | 15.0 | 35.8 |
| North | 12.3 | 32.8 |
| Northwest | 7.9 | 26.9 |
| Southwest | 14.6 | 35.4 |
| Northeast | 8.8 | 28.3 |
| **Total** | **100.0** | |
| **Economic factors** | | |
| Annual personal income (in 1,000 RMB) | 6.6 | 3.6 |
| Income differences from city median (in 1,000 RMB) | 0.6 | 0.8 |
| Percent not employed (25-34) | 13.6 | 5.9 |
| **Demographic factors** | | |
| Percent men (25-34) | 51.1 | 2.8 |
| Percent married (25-34) | 85.8 | 6.1 |
| Percent with college education (25-34) | 10.8 | 6.8 |
| Percent lived in another province 5 yrs. ago (25-34) | 6.4 | 10.3 |
| **Housing characteristics** | | |
| Housing cost of self-built housing (RMB logged) | 9.6 | 0.6 |
| Housing size (square meters logged) | 4.3 | 0.2 |
| Percent rental units | 10.6 | 10.9 |
| **Institutional factors** | | |
| Percent away from city of *Hukou* registration | 22.4 | 18.8 |
| Percent having agricultural *Hukou* | 70.4 | 13.7 |

Note: results are weighted by the size of city population.

**Table 3. Regression results for the determinants of headship rates for adults aged 25 to 34, 2005**

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| | **Geography** | | | **Economic factors** | **Demographic factors** | **Housing characteristics** | **Institutional factors** | **Full model** |
| Adj R-squared | 0.120 | 0.093 | 0.214 | 0.210 | 0.461 | 0.429 | 0.199 | 0.705 |
| Intercept | 35.614 *** | 30.659 *** | 36.876 *** | 27.059 *** | -59.051 *** | 96.961 *** | 26.060 *** | 32.717 ** |
| Tier 1 cities (Reference) | | | | | | | | |
| Tier 2 cities | -4.681 ** | | -5.141 ** | | | | | -0.826 |
| Tier 3 cities | -6.278 *** | | -6.493 ** | | | | | -1.303 |
| Tier 4 cities | -7.050 *** | | -6.969 *** | | | | | -1.023 |
| East (Reference) | | | | | | | | |
| South | | -2.753 ** | -3.448 * | | | | | -0.139 |
| Central | | -4.633 *** | -4.084 *** | | | | | -1.028 |
| North | | 0.619 | 0.166 | | | | | -2.009 * |
| Northwest | | -2.379 * | -1.708 | | | | | -1.151 |
| Southwest | | -0.519 | -0.387 | | | | | 0.762 |
| Northeast | | -0.936 | -0.427 | | | | | -2.560 ** |
| Annual personal income (in 1,000 RMB) (25-34) | | | | 0.782 *** | | | | 0.749 *** |
| Income (25-34) differences from city median (in 1,000 RMB) | | | | -1.709 *** | | | | -1.204 ** |
| Percent not employed (25-34) | | | | -0.138 * | | | | -0.085 |
| Percent men (25-34) | | | | | 0.972 *** | | | 0.681 *** |
| Percent married (25-34) | | | | | 0.441 *** | | | 0.464 *** |
| Percent with college education (25-34) | | | | | 0.224 *** | | | 0.107 |
| Percent lived in another province 5 yrs. ago (25-34) | | | | | 0.199 *** | | | -0.018 |
| Cost of self-built housing (RMB logged) | | | | | | -4.960 *** | | -4.896 *** |
| Housing size (square meters logged) | | | | | | -5.478 ** | | -7.718 *** |
| Percent rental units | | | | | | 0.338 *** | | 0.165 * |
| Percent away from place of *Hukou* registration (25-34) | | | | | | | 0.128 *** | 0.000 |
| Percent with agricultural *Hukou* (25-34) | | | | | | | 0.006 | -0.001 |

Note: results are weighted by city population size.

* p<0.05 **p<0.01 ***p<0.001 Two-tailed tests

**Table 4. Regression results for the determinants of nonfamily headship rates for adults aged 25 to 34, 2005**

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| | **Geography** | | | **Economic factors** | **Demographic factors** | **Housing characteristics** | **Institutional factors** | **Full model** |
| Adj R-squared | 0.443 | 0.204 | 0.567 | 0.713 | 0.899 | 0.845 | 0.881 | 0.926 |
| Intercept | 14.529 *** | 5.954 *** | 14.094 *** | 0.465 | 0.711 | -1.885 | -1.174 | -5.640 |
| Tier 1 cities (Reference) | | | | | | | | |
| Tier 2 cities | -6.608 ** | | -5.449 ** | | | | | 0.170 |
| Tier 3 cities | -7.806 ** | | -7.306 *** | | | | | 0.265 |
| Tier 4 cities | -10.711 *** | | -9.638 *** | | | | | 0.217 |
| East (Reference) | | | | | | | | |
| South | | 3.873 *** | 3.124 * | | | | | 0.844 * |
| Central | | -2.754 *** | -1.720 *** | | | | | -0.174 |
| North | | -1.517 * | -1.868 ** | | | | | -1.013 ** |
| Northwest | | -2.283 ** | -1.184 ** | | | | | 0.035 |
| Southwest | | -1.778 ** | -1.452 * | | | | | 0.481 |
| Northeast | | -2.266 ** | -1.435 ** | | | | | -0.565 |
| Annual personal income (in 1,000 RMB) (25-34) | | | | 1.157 *** | | | | 0.022 |
| Income (25-34) differences from city median (in 1,000 RMB) | | | | -1.199 ** | | | | 0.045 |
| Percent not employed (25-34) | | | | -0.162 *** | | | | -0.028 |
| Percent men (25-34) | | | | | 0.198 *** | | | 0.182 *** |
| Percent married (25-34) | | | | | -0.080 *** | | | -0.012 * |
| Percent with college education (25-34) | | | | | 0.108 *** | | | 0.085 * |
| Percent lived in another province 5 yrs. ago (25-34) | | | | | 0.316 *** | | | 0.122 ** |
| Housing cost of self-built housing (RMB logged) | | | | | | 0.347 | | -0.065 |
| Housing size (square meters logged) | | | | | | 0.008 | | -0.235 |
| Percent rental units | | | | | | 0.352 *** | | 0.053 * |
| Percent away from place of *Hukou* registration (25-34) | | | | | | | 0.222 *** | 0.092 *** |
| Percent with agricultural *Hukou* (25-34) | | | | | | | 0.020 ** | 0.007 |

Note: results are weighted by city population size.

* p<0.05 **p<0.01 ***p<0.001 Two-tailed tests