

Housing Windfalls and Intergenerational Transfers in China

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Abstract

In this paper, we study the impact of housing reform and the rapid development of the housing market in China on intergenerational transfers and elderly well-being. During the 1990s, the Chinese government gave property rights to many urban residents who had been allocated housing by their *danwei* employers. These unexpected windfalls were substantial in size, and grew with the rapid increase in housing prices over time, significantly impacting the asset holdings and wealth of affected urban residents. We examine the effect of these exogenous changes in wealth on inter-vivos transfers and intergenerational transfer motives.

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I. Introduction

The focus of the economics literature on intergenerational transfers has been on how changes in recipient income impact transfers. If transfers rise with recipient income, this is seen as evidence of an exchange motive. If transfers rise when recipient income falls, altruistic motivations cannot be rejected (Cox 1987). Often, these transfers and income changes are contemporaneous and temporary. In this paper, we examine how a permanent change in one's wealth influences transfers received from non-resident adult children.

We identify the effect of a permanent wealth increase on intergenerational transfers by instrumenting household wealth with the market windfall many employees of work units received when they purchased housing from their employers. In urban China, housing reform resulted in rapid appreciation of undersupplied housing in the private sector. Prior to the housing reform, *danwei* employers allotted housing to their employees. During the period of housing reform, since this housing was allocated before a housing market existed; significant random variation resulted in the size of housing windfalls associated with the market value later placed on specific locations. In this paper, we use this variation in the appreciation of housing market values to identify the impact of an exogenous increase in household wealth on intergenerational transfers.

Those who purchased subsidized housing from their work units received significant windfalls, resulting in an increase in household wealth and permanent income. If transfers from children to parents are motivated by altruism, we would expect children to reduce the amount transferred to their parents.

On the other hand, if children increase the amount they transfer to parents when parents receive this housing windfall, then their transfer motives are more likely to be strategic rather

than altruistic. Children may provide more to their parents in the hopes that parents will bequest their housing to them, or in exchange for living with them in better housing than they could afford at market rates. While children generally earn more than their parents, the housing windfall may also shift bargaining power within the family from adult children to elderly parents. They may be able to extract more time and care from their children as a result of this increased bargaining power.

In addition, wealth or asset holdings may be a better measure of elderly wellbeing than wage income, particularly in this context. In developing countries, income is hard to measure. Usually, expenditure proxies for income. In China, retired elderly receive little income. Some might receive pensions, but amounts are usually low. So they primarily rely on their wealth. In addition, wealth may reflect the occurrence of negative life events. For example, in the U.S., death and divorce slow down asset accumulation. Often assets are actually drawn down during such events. In the U.S., the evolution of assets is also very strongly related to health (Poterba, Venti, and Wise 2010). In urban China, the ability to draw down assets in times of need would be more difficult, since housing comprises nearly 80% of household wealth on average, and is an illiquid asset. Children might help their parents when they are in need so that they do not sell housing that would appreciate in value, allowing them to inherit this valuable asset or make use of it by living with parents.

Secondi (1997) finds that in China, child care services may be one of the main services the elderly provide their adult children in exchange for money, and that altruism alone cannot explain transfers from children to elderly parents. In addition, Li, Rosenzweig and Zhang (2010) use twin data in China to exploit a "natural experiment" resulting from parents having been forced to send away one of their children for rustification during the Cultural Revolution, and use

this experimental variation in parental time with children to identify its effect on transfers to children later in life, and whether transfers are motivated by altruism or guilt. The authors find that while transfers are motivated by altruism, guilt also plays an important role, as children who had been sent away for a longer period of time receive more transfers from parents, even when they have higher earnings.

While much of the recent empirical literature has pointed towards evidence of exchange motives, a number of studies have also found some evidence of altruism and risk-sharing using non-linear models. For example, for the Philippines, Cox, Jansen and Jimenez (2004) use a conditional least squares model to estimate the threshold pre-transfer income level at which point transfer motives switch from altruistic or risk-sharing motives to exchange motives. In China, Cai, Giles, and Meng (2006) find that children in China provide transfers to parents with low household incomes when income falls below the poverty line, which is consistent with an altruistic motive; although such transfers are not sufficient to fully compensate for negative income shocks to the elderly. The authors employ a semi-parametric partial linear model to estimate the relationship between net transfers and pre-transfer income without imposing any structure on the functional form (Yatchew 1998, 2003). Using this method, their findings are similar to those found by implementing the conditional least squares model previously introduced by Cox, Jansen and Jimenez (2004). Following this literature, we apply the conditional least squares model in order to examine whether there is a similar non-linear relationship between housing wealth and transfers.

We will examine whether parents who experience a significant wealth increase receive fewer inter-vivos transfers from their children. The unique policy instrument used here provides

for an excellent opportunity to further test whether transfers between parents and children are motivated by altruism or strategic behavior.

We begin with a summary of the housing reform policies that began in 1979 and largely ended in 1999. In Section 3, we describe the data and empirical analysis. Section 4 follows with a discussion of the empirical results. In Section 5, we conclude and discuss plans for future work in this area.

II. Housing Reform in China

Initial housing sales gave owners the right to use their property and pass it on through inheritance, but not the right to sell. Initial experiments began between 1979 and 1981, with the sale of new housing to urban residents at construction costs. In the early 1980s, all housing was purchased from work units.

In Gansu, this was true until the 1990s, and a private market for housing did not seem to really develop until 1998 (see Figure 1b). However, throughout much of the country, from 1982 to 1985, there were experiments with subsidized sales of new housing. The buyer paid one-third of the cost, while the remainder was subsidized equally by the employer and the city government. Such costs included the cost of land acquisition as well as the provision of local public facilities.

Experiments with comprehensive housing reform began between 1986 and 1988. At this time, public sector rents were raised; a housing subsidy for all public sector employees was introduced; and sales of public sector housing were promoted. In November 1991, a conference resolution “On Comprehensive Reform of the Urban Housing System,” resulted in large scale sale of public housing at very low prices, particularly to current occupiers. But in 1993, the government suspended this housing reform because of concern about very low prices of sales.

In 1994, a significant wave of housing reforms was put into place as a result of “The Decision on Deepening the Urban Housing Reform.” Under this system, employers and employees contributed to house savings funds. Rents were increased, especially for new tenants. However, low-income households received lower rents for old or unsellable public housing. Three price mechanisms were put into place for public housing sales: (1) high-income families paid market prices and received full property rights, including the right to resell on the open market; (2) low- and middle-income families paid below market prices, which covered all costs, including land acquisition, construction, and local public facilities; (3) for those who could not afford these costs, a transitional pricing scheme was offered, taking into account both cost and affordability. The latter two types of subsidized purchases only gave home-owners use rights. In order to resell, the owner would have to repay the housing subsidy that had been originally provided. During this time, few cities had any secondary housing market.

In July 1998, a new policy was developed in order to stop the material distribution of public housing to employees and to introduce a cash subsidy for housing issued by public sector employers. Specific policies varied across regions and details were determined by local bodies. In general however, affordable housing was built with government support for low- and middle-income families, which constituted 70-80 percent of urban residents). High-income families (10-15 percent urban residents) purchased higher quality housing in the market. Poor families were given subsidized rental housing by their employers or the city government. But local authorities and state enterprises often had insufficient resources to pay such subsidies.²

In both Gansu and Zhejiang, we can see the major housing reform policies in 1991 and 1996, when the number of housing purchases increased considerably from previous years (see Figures 1a and 1b). Work unit housing purchases began to decline in 1999 when housing reform

² For additional details on the history of housing reform policies in China, please see Wang and Murie (2000).

policies were for the most part coming to an end. While there was virtually no private housing market in Gansu until 1998, in Zhejiang, the number of houses purchased in the private market seems to be closely related to housing reforms. For example, market-bought housing purchases peaked in 1991, one year before work unit purchases peaked during the first major wave of reforms. Market-bought housing also declined when work-unit housing purchases peaked. In addition, the number of housing purchases in the private market rose significantly in 1998, two years after the peak in work-unit purchases in 1996, during the second wave of major reforms. These fluctuations suggest that as work-unit housing became increasingly available for purchase, the private market for housing developed rapidly in response.

[Figures 1a and 1b here]

By 1999, few houses could be purchased from employers. Private housing markets began to dominate the scene, with rapidly rising prices because of insufficient supply. Shing-Yi Wang (2010) examines the equilibrium price effects of the privatization of housing assets that were allocated by the state. Findings suggest that the removal of price distortions raised housing demand and equilibrium prices. Using variation in the timing of housing reform across cities, Iyer, Meng, and Qian (2010) find that housing reform increases the proportion of households living in private housing and lowers the proportion in public rental housing. Wang and Murie (2000) and Wang (2000) examine differences across different social groups and land-use zones (central vs. peripheral), focusing on Beijing.

In Figures 2a and 2b, we can see the rapid response of the market to the availability of work-unit housing on the private market, as the 2008 market value of housing purchased from work units increased considerably. In Zhejiang, the market value of housing purchased from work units during the two major reform periods in 1992 and 1996 was relatively high. Gansu

being a much poorer province, has seen lower housing windfalls. But all of the windfalls in Gansu have come from work-unit purchases. In Zhejiang, the average current market value of housing purchased from the market increased substantially in 1996. This may have to do with the resale of housing obtained during the earlier period of housing reform in the early 1990s. These differences in market values also reflect the fact that the quality of housing purchased from work unit was considerably higher than privately owned housing.

[Figures 2a and 2b here]

The degree to which households gained from the housing reform of the 1990s can also be seen vividly when the 2008 market values are compared to the average prices for housing at the time of purchase. In Figures 3a, we can see that work-unit purchases in Zhejiang were sold at considerably lower prices than housing sold in the private market. In the early 1990s, prices were extremely low and close to zero. In the second wave of housing reform beginning in 1996, prices for work-unit housing rose. This may reflect differences in the quality of housing made available, or in the fact that by 1993, the Chinese government became concerned about the extremely low prices at which *danwei* housing had been sold. Nonetheless, the purchase price for work-unit bought housing was around half the price of market-bought housing. In addition, market prices for housing rose considerably after the second wave of housing reforms in the mid to late 1990s. In comparison, in Gansu where most houses purchased were purchased from work units, there was not much change in purchase prices (see Figure 3b). Both work unit and market prices remained extremely low. In comparing these figures with Figures 2a and 2b, it is clear that households have benefited considerably from a rise in housing prices in recent years. In Zhejiang, a private market for housing seems to have developed as a result. This is an important point, since it indicates that housing assets were not completely illiquid assets. While in more

developed countries, housing assets tend to be relatively illiquid, it seems there were considerable gains to selling a home that had been purchased from one's work unit and may have been located in a choice location of the city. The primary constraint in selling one's home may be due to a lack of affordable housing to find in its place. Further research is needed to understand the extent to which such constraints have played a role. In terms of our analysis, such constraints would underestimate our results, since we may overestimating windfall gains to household wealth.

[Figures 3a and 3b here]

III. Data and Empirical Analysis

CHARLS Survey Data

We use data from a pilot study for the China Health and Retirement Longitudinal Survey (CHARLS), which was conducted in 2008. Surveyed households were restricted to those with members ages 45 and above. Much of the questionnaire was based on survey questions from the Health and Retirement Study in the U.S. (HRS), the English Longitudinal Study of Ageing (ELSA), and the Survey of Health, Ageing, and Retirement in Europe (SHARE). Two provinces were chosen for the pilot study. Zhejiang is a relatively wealthy and highly urbanized coastal province. In contrast, Gansu is the poorest province in China. It is located in the interior of the country, and is populated by many non-Han minorities. In the two provinces, 48 communities or villages were surveyed, belonging to 16 counties or districts. The overall sample is comprised of 2,685 individuals living in 1,570 households.

In this study, since only official urban residents were affected by the housing reform, we restrict our sample to those households in which the respondent or spouse holds an urban *hukou* or official urban registration, and the household is in an officially designated urban area. An urban area is defined as an area with a designated community office rather than a village office.

Housing reforms were largely implemented by community offices, since work units or *danwei* employers were located in these areas. This restricts our sample to 258 respondents. We restrict our sample of children of these respondents to those who are the biological children of either the respondent or spouse, resulting in 588 children. Of these children, 575 of them are adults (age 16 and above).

We remove 10 observations on current housing wealth, as these observations are above the 98th percentile for wealth and are outliers. These respondents all live in Zhejiang. Housing wealth for these 8 observations is above 2,000,000 RMB; excluding zero values, average housing wealth in urban Zhejiang is approximately 500,000 RMB with the outliers and approximately 350,000 RMB without them.

Finally, the sample is further restricted to non-resident adult children, resulting in a sample of 437 children of 181 respondents. Our final regression sample is slightly smaller because of missing data on the year in which respondents purchased their housing. The latter is needed to deflate the nominal value of housing purchase prices to real terms. Of the 437 children in our sample, we know the year housing was purchased by their parents for 422 children.

Of the 437 children in our sample, 393 children gave at least as much to their parents as they received from them (non-negative net transfers from children); and 258 children gave more to their parents than the amount they received from them (positive net transfers from children). Our analysis focuses on these two samples. We exclude those respondents who are net givers of transfers to children in order to study the impact of how wealth increases influence transfer receipts from children. Since net givers are inherently different from the majority of net recipients in our study, we exclude them from the analysis here. Summary statistics for all

variables included in the analysis below are presented in Table 1. Means and standard errors were estimated using household sampling weights.

[Table 1 here]

All monetary values are reported in 2008 RMB real terms. Whenever possible, the Brandt-Holz spatial urban deflator specific to Zhejiang and Gansu is used.³ This is available for the years 1986 through 2004. All other values are deflated by the province-specific urban consumer price index provided by the China National Bureau of Statistics in annual Statistical Yearbooks.⁴

Monetary values used in the analysis below include housing assets, housing windfalls, non-housing assets, and per capita *full* household income. Following Cai et al. (2006), we use the latter as a measure of income in order to account for any potential unobserved income differences across recipient households, particularly in underestimating the long-term earnings potential of retirees. In order to estimate this income measure, we estimate a Mincer wage regression for all household members of legal working age (some who may have retired early are included here). For each household member, the natural logarithm of the most recent monthly wage is regressed on age, age squared, gender, and dummy variables for the highest education level achieved. Estimates from this regression are then used to predict wages for all household members of legal working age. This income is added to other non-wage sources of income such

³ <http://ihome.ust.hk/~socho1z/SpatialDeflators.html>

⁴ <http://chinadataonline.org/member/yearbooknew/yearbook/> and <http://www.stats.gov.cn/english/statisticaldata/yearlydata/>

as public transfers. The correlation between this measure and per capita household income is 0.9178.⁵

In addition to detailed questions regarding income, respondents were asked specifically about their housing assets and how they were impacted by housing reform policies. The main respondent was asked detailed questions regarding purchase of the house of residence. In addition, the main respondent and spouse were asked about any housing they had purchased from a work unit. Questions include: who purchased the house, who owns the house, year of purchase, purchase price, market price at time of purchase, and current market price. The present value of all currently owned housing was summed to determine total housing wealth. This includes housing purchased from a danwei or from the market. In our sample, approximately 70% of housing purchases were bought from a danwei and 30% were bought in the private market.

Respondents were asked about the current market value of their residences and other owned housing in the household asset questionnaire, but they did not provide information on currently owned housing in addition to their current residence that had been purchased from a work unit. This information was provided in the individual asset questionnaire, where respondents were explicitly asked about housing they had ever purchased from a work unit. However, this questionnaire did not include a question on the current market value of such housing, as most respondents were asked this question of their current residences and many of those who purchased housing from a work unit which they do not live in was sold. For 28 male respondents and 7 female respondents, they did in fact report such housing. In order to

⁵ Results of this Mincer regression, and regressions presented below with the alternative observed measure of per capita household income are available upon request from the authors. Regression results are similar to those presented below.

incorporate this housing in total housing wealth, these values were imputed using the local community average market value for urban housing bought from a danwei. For one respondent, there was no other such housing in the local community. The county average market value for urban housing bought from a danwei was used in this case. For one additional respondent, there was no such housing in the county, so the current market value was imputed from the province average market value for urban housing bought from a danwei.

The total housing value was then instrumented by the total housing windfall, which is the sum of: the difference between the current market price of all currently owned housing and the original purchase price in real terms; and the difference between the price at which housing was sold and the original purchase price in real terms. Thus, while differences in housing wealth may reflect some differences in lifetime earnings, the housing windfall is independent of such differences because it varies depending on the price at which the housing was originally purchased, which was exogenously determined by state policy. This windfall is determined by all housing purchases, 70% of which were bought from a danwei and the remainder was bought in the private market. The average windfall in our sample is approximately 100,000 RMB (see Table 1 below). With average household size being 2.5, the average windfall in per capita terms is approximately 40,000 RMB. Since average annual per capita income is around 18,000 RMB, this means that the average windfall in per capita terms is more than twice annual household income. Actual windfalls are even higher because the average windfall here includes those who did not receive any windfall. Thus, housing windfalls resulted in a very considerable increase in household wealth.

For three current residences owned by the respondent, the original purchase price was missing. As these residences had originally been purchased from a danwei, these prices were

imputed by the local community average purchase price in real terms for urban housing bought from a danwei. Similarly, missing purchase price data for any danwei-bought housing that is not a current residence was imputed in the same manner for 27 male respondents and 7 female respondents. For one male respondent, there were no such prices in the local community, so the county average purchase price for urban housing bought from a danwei was used instead.

In addition to questions regarding housing, respondents and spouses were asked detailed questions regarding the value of household assets such as: a car, bike, refrigerator, washing machine, TV, computer, and mobile phone. They were also asked about household and individually-held financial assets such as cash, savings, stocks, and funds. In order to compute a measure of non-housing related household wealth, we sum up all of these assets and deduct the household's outstanding and unpaid loans, both formal and informal ones.

Finally, in addition to these financial questions, respondents were asked a number of detailed questions about financial transfers. The first question in this section of the survey was quite detailed, in order to remind the respondent of all of the different possible sources of help they may have received or provided to others in the past year: "Did you or your spouse receive more than 100 Yuan in financial help last year from any others? By financial help we mean giving money; helping pay bills; covering specific costs, such as those for medical care or insurance, schooling, and down payment for a home or rent; and providing non-monetary goods." The respondent was then asked: "What kind of help did you receive: regular or non-regular allowance? What is the total value of regular financial help you received? How much non-regular financial help, such as an allowance, a living stipend, or money for school expenses, did you receive in the past year?" Respondents also noted any transfers received during special occasions such as festivals, holidays, birthdays, or marriages. The focus of our analysis will be

on all of these received transfers combined, net of transfers provided to adult non-resident children. Results will also be compared to gross transfers received.

Linear Regression Analysis

We are interested in measuring the extent to which the value of housing assets influences transfers received from adult children. To begin with, we estimate the following Tobit regression:

$$\text{Transfers}_{ij} = b_0 + b_1(\text{Housing Wealth})_i + b_2X_{ij} + b_3X_i + \mu_c + \varepsilon_{ij} \quad (1)$$

where X_{ij} are child level controls, X_i are characteristics of the main respondent and spouse, and μ_c are community fixed effects. Child characteristics include: age, gender, birth order, dummy variables for highest education level attained, whether the child is currently working, whether the child is married, dummy variables for the number of adult non-resident brothers and sisters, and whether the child lives in the same community or neighborhood as the parent. Characteristics of the parent include: non-housing assets, per capita *full* household income, marital status, number of non-adult children, household size, and dummies for five year intervals of the year of the first housing purchase interacted with whether a housing purchase was made. Parent controls also include several characteristics of the household head, which is defined as the husband (child's father) if the respondent is married and living with a spouse, and the respondent otherwise (whether male or female). Thus, the household head is the child's father or husband if alive, and the child's mother if the child's father or the respondent's husband is not living. Characteristics of the household head that are included in all regressions are age, age squared, whether the household head was employed in the public sector, and dummy variables for the highest

education level of the household head. All standard errors are clustered at the family or household level (or main respondent and spouse).

Estimates of b_1 are likely to be biased since households owning a greater amount of housing wealth may also behave differently than poorer households when it comes to decisions regarding intergenerational transfers. For example, wealthier individuals may have better educated or higher ability children who provide them with greater financial assistance, or alternatively, who require less financial assistance from parents. If wealthier children give more, and housing wealth shocks are correlated between children and parents, this may create upward bias in our estimates. In addition, reverse causality may be at play here. Respondents who receive more transfers from children on a regular basis may save this source of income and would have larger holdings of financial assets as a result.

For these reasons, we employ an instrumental variables approach, using estimates of the housing market windfall as instruments for housing wealth. The following two-stage least-squares regressions are estimated:

Stage 1:

$$(\text{Housing Wealth})_i = b_0 + b_1 Z_i + b_2 X_{ij} + b_3 X_i + \mu_c + \varepsilon_{ij} \quad (2)$$

Stage 2:

$$\text{Transfers}_{ij} = b_0 + b_1 (\text{Estimated Housing Wealth})_i + b_2 X_{ij} + b_3 X_i + \mu_c + \varepsilon_{ij} \quad (3)$$

where Z_i is our instrument for housing wealth. The instrumental variable used here is the difference between the current housing market value and the price at which the house was originally purchased if it is still currently owned, combined with the difference between the price at which any work unit housing was sold and its purchase price. All standard errors are clustered at the family or household level (or main respondent and spouse).

There are a number of potential endogeneity issues that need to be addressed here. Housing with higher markups over time is likely to be better than average quality. The type of person who is allocated this type of housing and can afford to purchase it (perhaps even with a subsidy) may be different from the average person. Some may choose to work in a work unit in order to receive subsidized housing in a good location. In addition, living arrangement decisions may be impacted directly by these changes in the housing market, which would also impact intergenerational transfers.

In order to examine the extent to which such biases may affect our estimates, we examine whether a child's characteristics are affected by the housing market windfall or total housing value. We also examine whether living arrangement decisions of adult children are impacted by these wealth measures.

Conditional Least Squares

In order to determine transfer motives, recent studies in developing countries examining the relationship between transfers and recipient pre-transfer income have emphasized the non-linearity of the relationship (Cox et al. 2004, Cai et al. 2006). While linear regression results do not necessarily point towards a strong relationship between wealth and transfers, the conditional least squares model indicates that this is likely due to a non-linear relationship between housing wealth and transfers. In order to examine this more closely, we follow the approach used by Cox et al. 2004 and Cai et al. 2004. The latter authors showed that this method yields similar results to those derived from a partial linear model (described in greater detail by Yatchew 1998, 2003). As the latter method requires a considerably large sample size, we implement the conditional least squares model.

In this model,

$$\text{Transfers}_{ij} = b_0 + b_1 \min(H_i, K) + b_2 \max(0, H_i - K) + b_3 X_{ij} + b_4 X_i + \mu_c + \varepsilon_{ij} \quad (4)$$

where H_i is recipient housing wealth and K is the point at which transfer motives switch from altruistic to exchange motives. If transfers are altruistically motivated, then the derivative between transfers and wealth or windfall would be negative, since children would provide fewer transfers to parents who are in less need of them. The other variables are defined as before. Similarly to Cai et al. (2006), we use net transfers received as the main dependent variable, and gross transfers received as a robustness check. As in the linear regressions, all standard errors are clustered at the family or household level (or main respondent and spouse).

As housing wealth is potentially endogenous, we instrument this variable with housing windfall. Thus, we estimate the following set of regressions using a two-step instrumental variables tobit estimator:

Stage 1:

$$\min(H_i, K_H) = b_0 + b_1 \min(W_i, K_W) + b_2 \max(0, W_i - K_W) + b_3 X_{ij} + b_4 X_i + \mu_c + \varepsilon_{ij} \quad (5)$$

$$\max(0, H_i - K_H) = b_0 + b_1 \min(W_i, K_W) + b_2 \max(0, W_i - K_W) + b_3 X_{ij} + b_4 X_i + \mu_c + \varepsilon_{ij} \quad (6)$$

Stage 2:

$$\text{Transfers}_{ij} = b_0 + b_1 \text{est. } \min(H_i, K_H) + b_2 \text{est. } \max(0, H_i - K_H) + b_3 X_{ij} + b_4 X_i + \mu_c + \varepsilon_{ij} \quad (7)$$

In this model, H_i is housing wealth, W_i is the housing windfall, K_H is the value of instrumented housing wealth at which transfer motives change from altruistic to exchange motives, and K_W is the value of the housing windfall which best instruments for the value of housing wealth K_H . As in the linear regressions, all standard errors are clustered at the family or household level (or main respondent and spouse).

IV. Empirical Results

Results of the Linear Model

Table 2 summarizes results from Tobit and IV Tobit estimations where net and gross transfers received from adult non-resident children are the dependent variables and housing wealth is the main independent variable.

[Table 2 here]

In these linear regressions, coefficient estimates on housing wealth are not statistically significant. In the Tobit regressions, coefficients on wealth are positive, whereas in the IV Tobit regressions, they are negative, pointing towards possibly altruistic motives behind transfers. However, these estimates are imprecise.

In the Tobit regressions, coefficient estimates on housing wealth may be positive if wealthier households have children who are also wealthier and provide additional resources to their parents as a result of their improved positions. Thus, by instrumenting for wealth with windfalls arising from housing reform, we can identify the effects of an increase in wealth on transfers. Indeed, in the IV Tobit, where housing wealth is instrumented by housing windfall, results indicate a negative linear relationship between housing wealth and transfer receipts. Coefficient estimates are negative but not statistically significant. An increase in housing wealth of 10,000 RMB results in a decline in transfers received from children of roughly 1 to 3 RMB. Thus, coefficient estimates are imprecise and of low magnitudes.

These estimates indicate that Tobit estimates were misestimating the effect of housing wealth on transfer receipts. Respondents with more housing wealth may have wealthier children who would provide more to their parents, or would need less assistance from parents. However,

an exogenous increase in housing wealth indicates that parents may receive fewer transfers from their children, pointing towards possible evidence of altruism.

In addition, results of the first stage of the IV Tobit regressions are summarized at the bottom of Table 2. Coefficient estimates on housing windfall are statistically significant and very close to one.

Finally, our measure of per capita full household income has no impact on non-negative net transfers, but is positively and statistically significantly related to positive net transfers. Thus, conditional on respondents receiving transfers from a non-resident adult child, a one RMB increase in full household income of the respondent implies an increase of 0.06 RMB in transfer receipts. Considering that average transfers are around 1400 RMB, this is a relatively negligible increase.

Results of the Conditional Least Squares Model

In the results above we have found that linear estimates of housing wealth on transfers indicate there is no statistically significant relationship between the two. In this section, we apply the conditional least squares model outlined above to examine whether the linear relationship may be underestimating the degree to which transfer motives are altruistic because transfers at higher wealth levels may not be as greatly affected by marginal increases in wealth, with altruism being strongest for lower levels of wealth.

Results of these regressions, summarized in Table 3 below, indicate there is a non-linear relationship between housing wealth and net transfers, and this relationship is maintained when we examine the effect of housing wealth on gross transfer receipts. These non-linear estimates also indicate that linear estimates underestimate the relationship between transfers and housing wealth for those parents with wealth levels at or below the 48th percentile (a housing wealth

level of around 80,000 RMB). Beyond this kink point, the relationship between wealth and transfers becomes relatively flat and coefficient estimates are not statistically significant. Thus, housing wealth and transfer receipts are more strongly negatively related at lower wealth levels, with altruism playing a stronger role at these lower levels.

[Table 3 here]

This negative relationship is even stronger when housing wealth is instrumented by housing windfall. While tobit regressions imply that a 10,000 RMB increase in housing wealth results in a decline of 156 to 285 RMB in transfers, when wealth is instrumented by housing windfall, this effect increases to around 470 to 690 RMB in transfers (an average decrease of roughly 34 to 49%). These results clearly point out the selection bias inherent in the non-instrumented results. Median housing wealth below the kink point of 80,000 RMB would be roughly 40,000 RMB. An average 10% increase in housing wealth below the kink would then be roughly 4,000 RMB. Thus, according to the IV Tobits, such an increase in housing wealth would imply a roughly 13 to 20% decline in transfer receipts. The optimal kink point at which transfer motives shift is at a housing windfall of around 40,000 RMB, after which point coefficient estimates are small in magnitude and not statistically significant.

Coefficient estimates on full income per capita remain relatively unchanged from those found in the linear regressions. However, this could also be due to the possibility of there being a non-linear relationship between full income and transfers, as has been found in previous research studies. So we estimate the conditional least squares model in which both housing wealth and full income enter non-linearly into the regression on transfer receipts. In order to achieve these estimates, we use the optimal kink points found for housing wealth and windfalls and search over

the range of full income values for the optimal kink point on full income that generates the highest R-squared or Chi-squared. Results are presented in Table 4 below.

[Table 4]

For the sample of non-negative net transfers, full income below 6014 RMB, or the 31st percentile, is positively related to transfer receipts. An average 10% increase in income below the kink point (roughly 300 RMB) would imply an increase in transfer receipts of roughly 5.6% to 8.6% on average. Income above the kink point does not influence transfers. However, conditional on respondents receiving a positive net transfer, net transfer receipts are not impacted much by full income changes. Gross transfers are positively related to full income, particularly below the optimal kink point of 43,600 RMB (26th percentile). Although full income is not instrumented in the IV Tobit regressions, coefficients on full income below the kink increase from 0.25 to 0.62. A 10% increase in full income below the kink point of roughly 2200 RMB implies an increase in gross transfer receipts of roughly 38% to 93%. Thus, recipient income is positively related to transfers. This points towards the possibility of non-altruistic motives behind transfers. However, it is difficult to isolate this explanation from the possibility that children of higher income recipients can simply afford to provide more transfers to parents, particularly since they provide significantly greater gross transfers rather than net transfers.

Determinants of Housing Wealth and Windfall

In order to examine any potential endogeneity bias in our instrument for housing wealth, we estimate regressions on housing wealth and the windfall for the sample of CHARLS respondents. Child-specific characteristics are averaged for each respondent, so that unlike in previous regressions, the unit of observation here is the respondent rather than the child.

Regression results summarized in Table 5 below demonstrate that there are no significant observable determinants of the housing windfall other than the year of the housing purchase. Those who bought housing in the 1990s received a significantly higher windfall than in other years, roughly 200,000 RMB more than those who did not purchase any housing. These estimates are also statistically significant at the 0.1% level. These estimates reflect the fact that most of the reforms occurred at this time. Prior to the 1990s, there was not much sale of danwei housing. After the 1990s, the government began raising purchase prices of danwei housing, and market pressures with the advent of private sales may have also resulted in lower windfalls from such purchases.

[Table 5 here]

Whereas full income is a statistically significant determinant of housing wealth, this is not the case for housing windfalls. In addition, the magnitudes of these coefficients are relatively low. Keeping in mind that average full income is roughly 18,000 RMB, a 10,000 RMB increase in full income would be related to an increase in housing wealth of 20,000 RMB, a 10% average increase, and an increase in housing windfall of roughly 10,000 RMB or a 5% average increase. Thus, income would have to increase by nearly 50% on average in order to raise the windfall by 5%. Results are similar when observed per capita household income is used instead of our measure of full income.

In addition, those respondents with more adult children are wealthier, but did not necessarily receive a higher housing windfall. This points towards one possible source of the endogeneity bias inherent in the above Tobit regressions. Wealthier respondents have more adult children, which may foster greater competition among these children in providing greater support to parents. By instrumenting for housing wealth with the windfall, such bias is not at

issue. As previously mentioned, housing was allocated to employees regardless of family size. These results demonstrate that whereas there are several endogeneity issues in measuring housing wealth that would bias Tobit estimates, housing windfall is not plagued by such biases. Below, we examine whether housing wealth influences characteristics of adult children and potential competition among siblings.

Living arrangements and characteristics of adult children

While the empirical results above indicate that transfer motives are altruistic in this context, the relationship between transfers and housing wealth may be confounded by the fact that parents with higher housing wealth live in nicer and larger accommodations which may be more attractive places for adult children to live in with their parents. Results of probit estimates in Table 6 indicate that children are not necessarily more likely to live with parents whose housing wealth is greater, even when housing wealth is instrumented by housing windfall.⁶ Note that these regressions are estimated at the same optimal kink point derived in the main results discussed above. Unlike in previous regressions, these estimates are based on the sample of all adult children. While previous regressions included only non-resident adult children, these estimates also include co-resident adult children.

[Table 6 here]

For the sample of non-resident adult children only, probit and IV probit estimates on the likelihood that they live outside their parents' local neighborhood also do not show any significant relationship between this outcome and housing wealth. Even when housing wealth is instrumented by housing windfall, coefficient estimates are not statistically significant. Since the analysis above was based on non-resident children, estimates using housing windfall as an

⁶ Note that as in prior regressions, these estimates also include community fixed effects. For this reason, the sample size for all adult children is relatively small.

instrument for housing wealth would not be biased by any influence of housing value on a child's living arrangement decisions.

In addition, regression results indicate that housing wealth does not have a statistically significant impact on the likelihood that a child is currently working or on a child's educational attainment. To the extent that the highest education level achieved is a reasonable proxy for income, these regressions indicate that respondents with higher housing wealth do not generally have better off children.

When the dependent variable is child age or birth order, OLS estimates on housing wealth are relatively low in magnitude and not statistically significant, whereas coefficient estimates on housing wealth are statistically significant in the two-stage least-squares estimates, when housing wealth is above the optimal kink point determined in the main regressions on transfer receipts. This is not due to the timing of housing reforms since dummy variables for the year of purchase are included as control variables. One source of the difference between housing value and windfall is that the windfall includes all housing bought from a work unit and subsequently sold, whereas the housing value only includes currently owned housing. If respondents with younger children were more likely to sell their housing in order to buy housing to accommodate younger children, or to help them buy their own housing (especially if they are too young to be eligible for their own windfall), this may be one explanation for this finding. Since birth order is also negatively related to housing wealth, this phenomenon may be especially true for respondents with younger and fewer children. These results indicate the importance of controlling for child age and birth order in all regression estimates, as we have done. It is also important to note however that the negative relationship between housing wealth and age or birth order is only statistically significant for wealth levels above the kink point,

whereas the main findings on the relationship between housing wealth and transfers is for wealth levels below the kink point.

Finally, parental housing wealth may make men and women more attractive in the marriage market. In order to test for this possibility, we regress the likelihood of a child being married on housing wealth. Because around 80% of adult non-resident children are married, two-step IV Probits are estimated. Those whose parents have a housing wealth level above the optimal kink point are statistically significantly less likely to be married. In the IV Probits, coefficients are also negative for those whose parents have wealth levels below the kink point. Although those estimates are much larger, they are not statistically significant. Similar results are found when child gender is interacted with housing wealth and windfall. So we do not find any differences between men and women. Thus, we find no evidence that parental housing wealth improves child marriage prospects. In fact, we find that for the children of the wealthiest parents, marriage may seem less attractive.

Finally, we examine the possibility that sibling competition may influence transfers to parents. Housing wealth both below and above the optimal kink point found in the main regressions is interacted with the number of siblings (one, two, or more than two). In the IV Tobit regressions, similar interaction terms with housing windfall are included as instruments for interaction terms with housing wealth. For all those with siblings, Tobit regressions imply similar findings to those found in the main regressions without interaction terms. For those without siblings, housing wealth below the kink point is positively related to transfers. Thus, an only child may provide more transfers to wealthier parents. But the estimates are not statistically significant, and endogeneity issues may play a role here.

[Table 7 here]

In contrast, in the IV Tobit regressions, only children provide far fewer transfers to wealthier parents when their wealth is below the kink point. Coefficient estimates are high in magnitude and statistically significant at the 5% level. Having siblings reduces this negative effect considerably, but it still remains, with the exception of those with two siblings. Children with two siblings provide slightly more transfers to wealthier parents at wealth levels below the kink point. These regressions point towards the possibility that altruistic motivations behind transfers are considerably reduced by the presence of siblings. Siblings may indeed provide a competitive motive for providing support to parents. However, the altruistic motive is not completely negated by such competition, as the effects still remain negative. Similar findings hold for the subsample of positive net transfers, although the effects are considerably weaker. While children may not be able to influence whether or not they have siblings, parents may have these effects in mind at least in part, when determining to have children. Note that this sample was not affected by the one child policy of the 1980s. Additional research is needed in this area to determine how much of this possibility of competition cannot be explained by such endogeneity issues.

Sensitivity Analysis

In this section, we examine the robustness of our main regression estimates using the same optimal kink points derived earlier. We examine the possibility of several different biases.

Firstly, possible selectivity bias may be associated with the fact that the housing windfall increases the probability that a child co-resides with the parent, which may naturally reduce transfers from non-coresident children. We address this issue in two ways. First, we include an additional control of whether the respondent lives with any adult child. Results are presented in Table 8 below. Coefficient estimates on housing wealth are robust to the addition of this control

variable. Second, we estimate regressions for the subsample of children whose parents do not live with any adult children. Coefficient estimates on housing wealth below the kink point are much more strongly negative here. Thus, parents who do not live with an adult child receive much more support from children as their wealth declines than do those who do live with an adult child. Our main findings are therefore likely to underestimate the degree of altruism at play here because children provide more support to those parents who do not co-reside with any adult child, and our main estimates are based on the sample of all parents, whether or not they co-reside with an adult child.

[Table 8 here]

A second possibility for selection bias may be due to the possibility that housing wealth shocks could be correlated between children and parents, and if they live in the same regions, would create upward bias in our estimates if we believe that wealthier children should give more. In fact, 75% of the adult non-resident children in our sample live in the same city as their parents. In order to address this, we include interaction terms between housing wealth and a dummy variable equal to one if the child lives in the same city as the parent. In the IV Tobits, this dummy variable is interacted with housing windfall in order to instrument for the new interaction terms. IV estimates are robust to the inclusion of these interaction terms, and these interactions are not statistically significant or high enough in magnitude to influence the effect of housing wealth on transfers. Only in the Tobit regressions is the interaction term with housing wealth below the kink point statistically significant and of considerable magnitude. This points to the importance of instrumenting for housing wealth.

Finally, we estimate the main regressions without imputing missing values on housing wealth or windfalls. Coefficient estimates are very similar to those of the main regressions.

Magnitudes are slightly higher and are more precise. This is particularly the case with the uninstrumented Tobit regressions. Thus, imputing missing values does not change the main findings.

V. Conclusion

We have shown that housing reform policies have significantly raised housing market values. Employees of work units were allocated housing by their employers, were then given the right to buy this housing at subsidized rates, and benefited considerably as private housing markets developed and housing prices rose considerably. We have shown that such windfalls have had a considerable impact on household wealth, and that family members take this into consideration when providing financial help to windfall recipients. Those who benefited from such windfalls receive considerably less financial help from children, indicating that transfers from children are likely to be altruistically motivated.

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Figure 1a. Number of Housing Purchases in urban Zhejiang

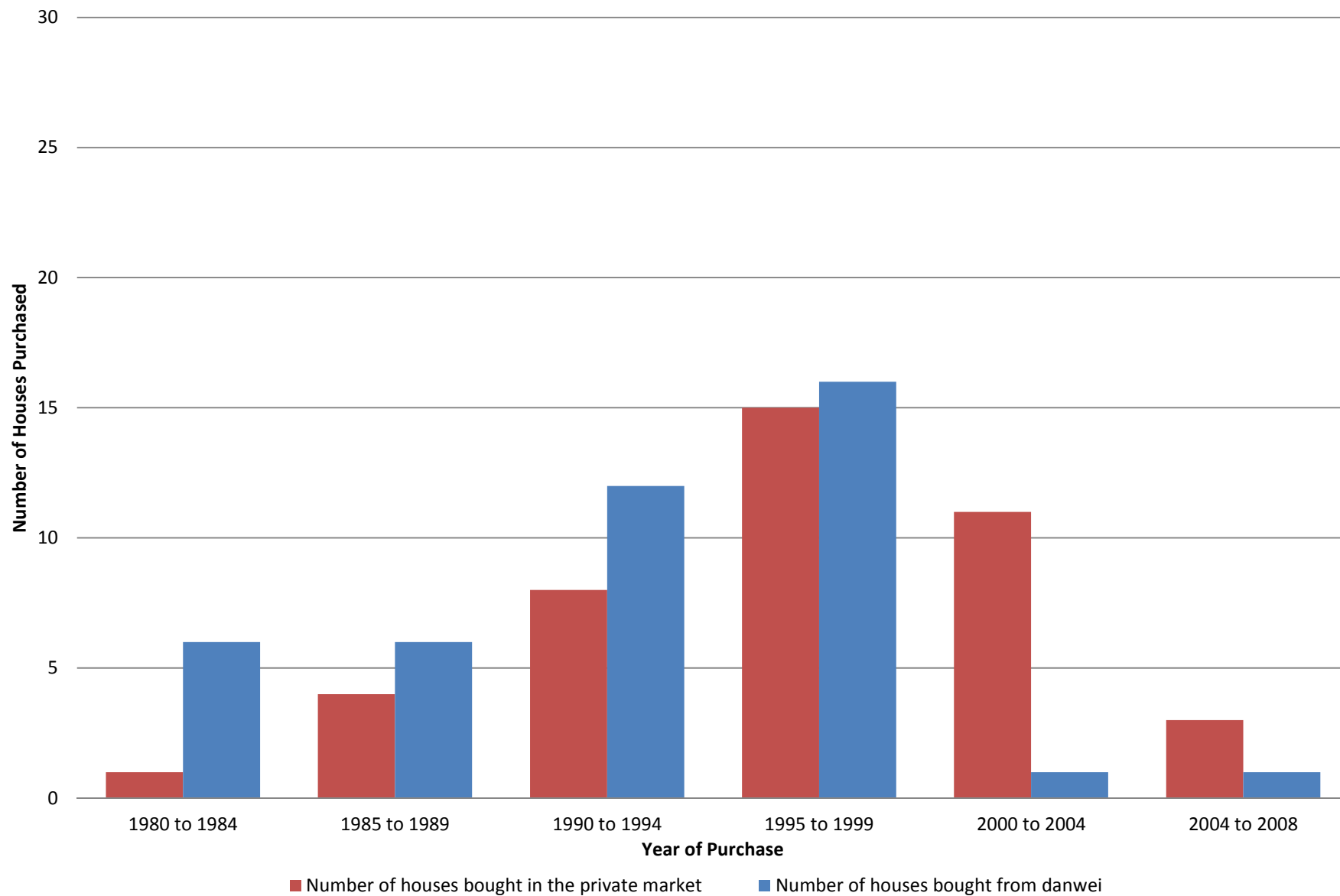


Figure 1b. Number of Housing Purchases in urban Gansu

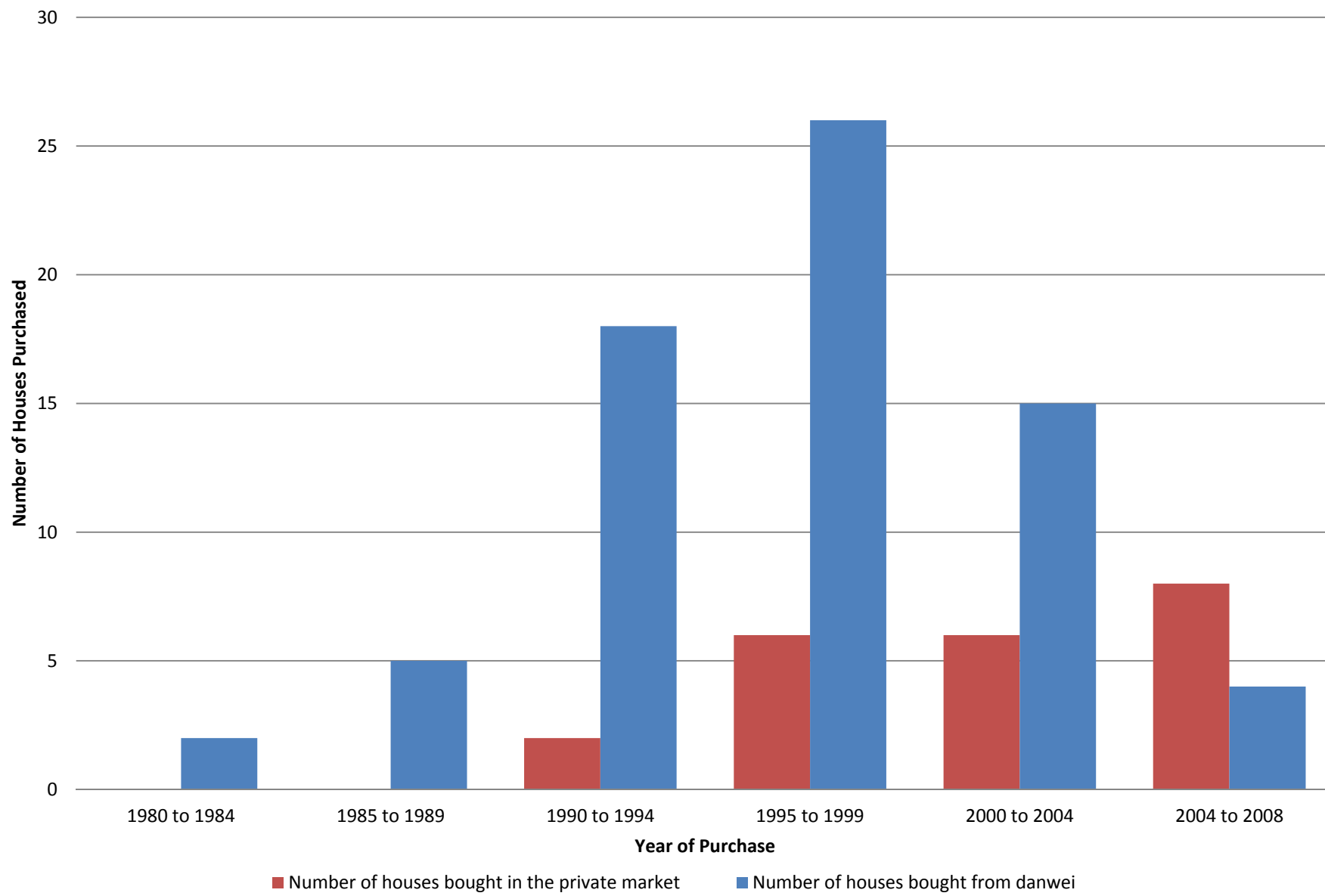
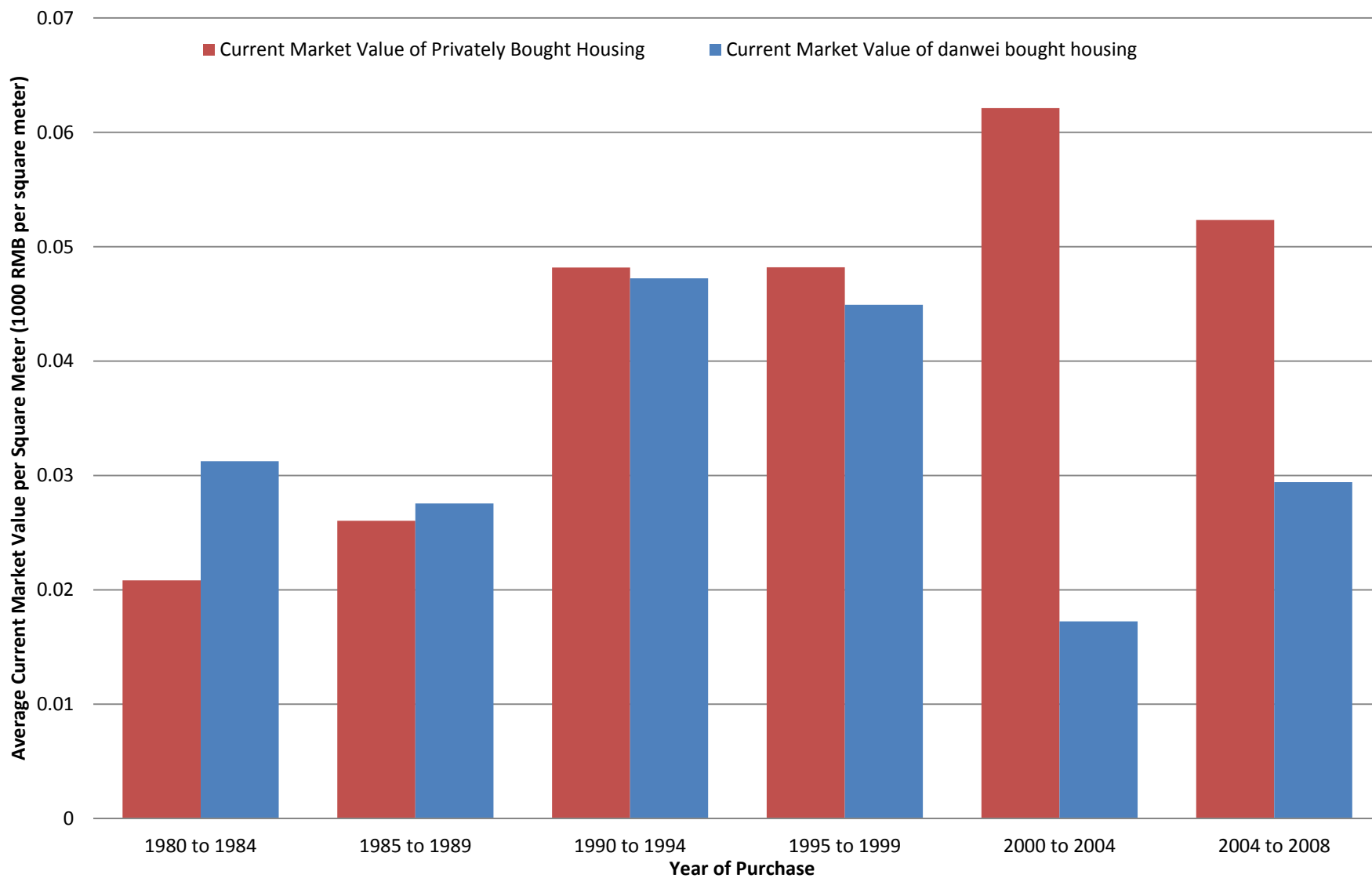
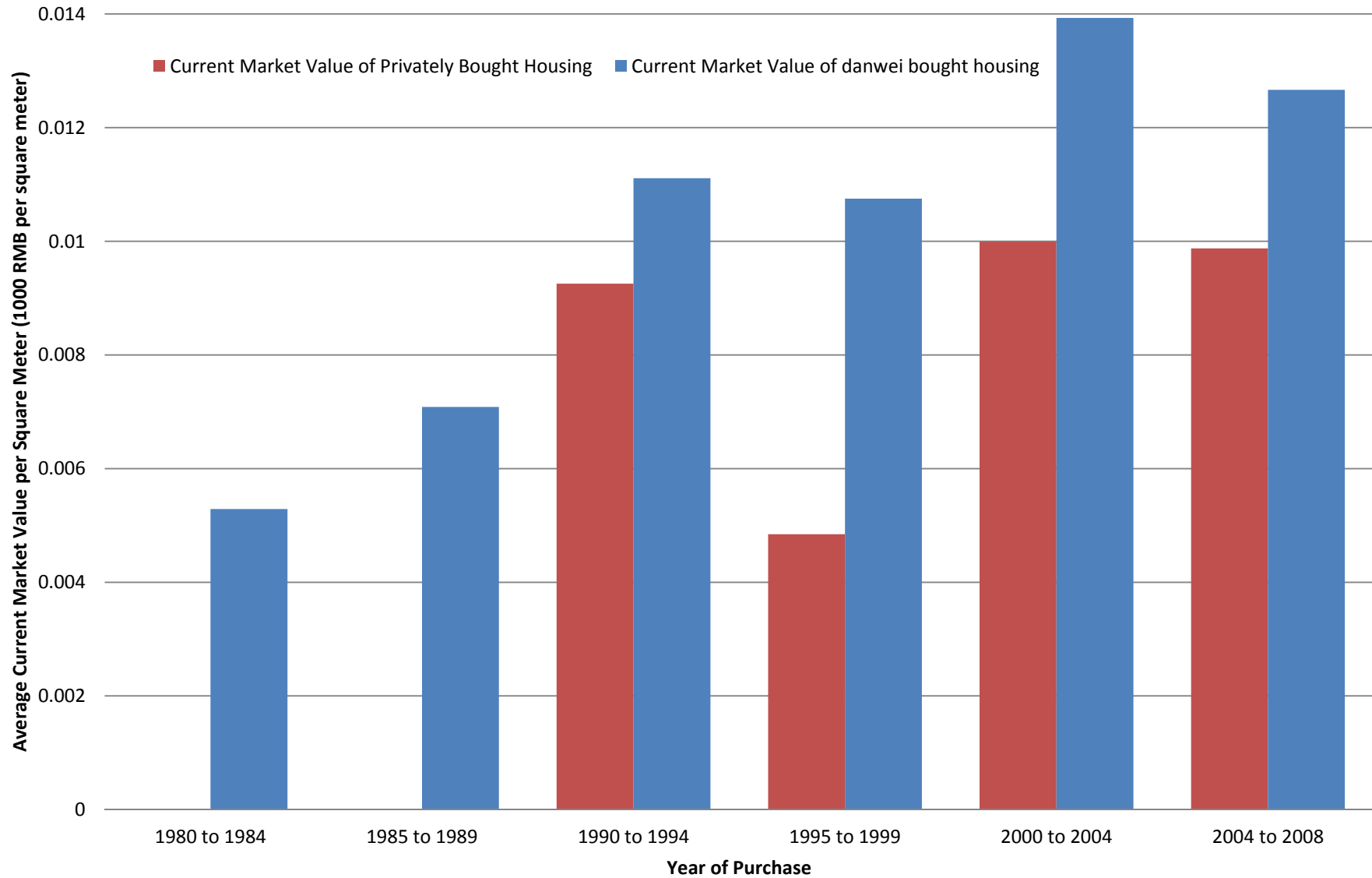


Figure 2a. Current Market Value of Housing in urban Zhejiang



All values are deflated by the urban province-specific CPI, where the 2008 Zhejiang CPI=100. The Brandt-Holtz deflator is used for 1986-2004. For all other years, the urban province-specific CPI is from the China Statistical Yearbooks.

Figure 2b. Current Market Value of Housing in urban Gansu



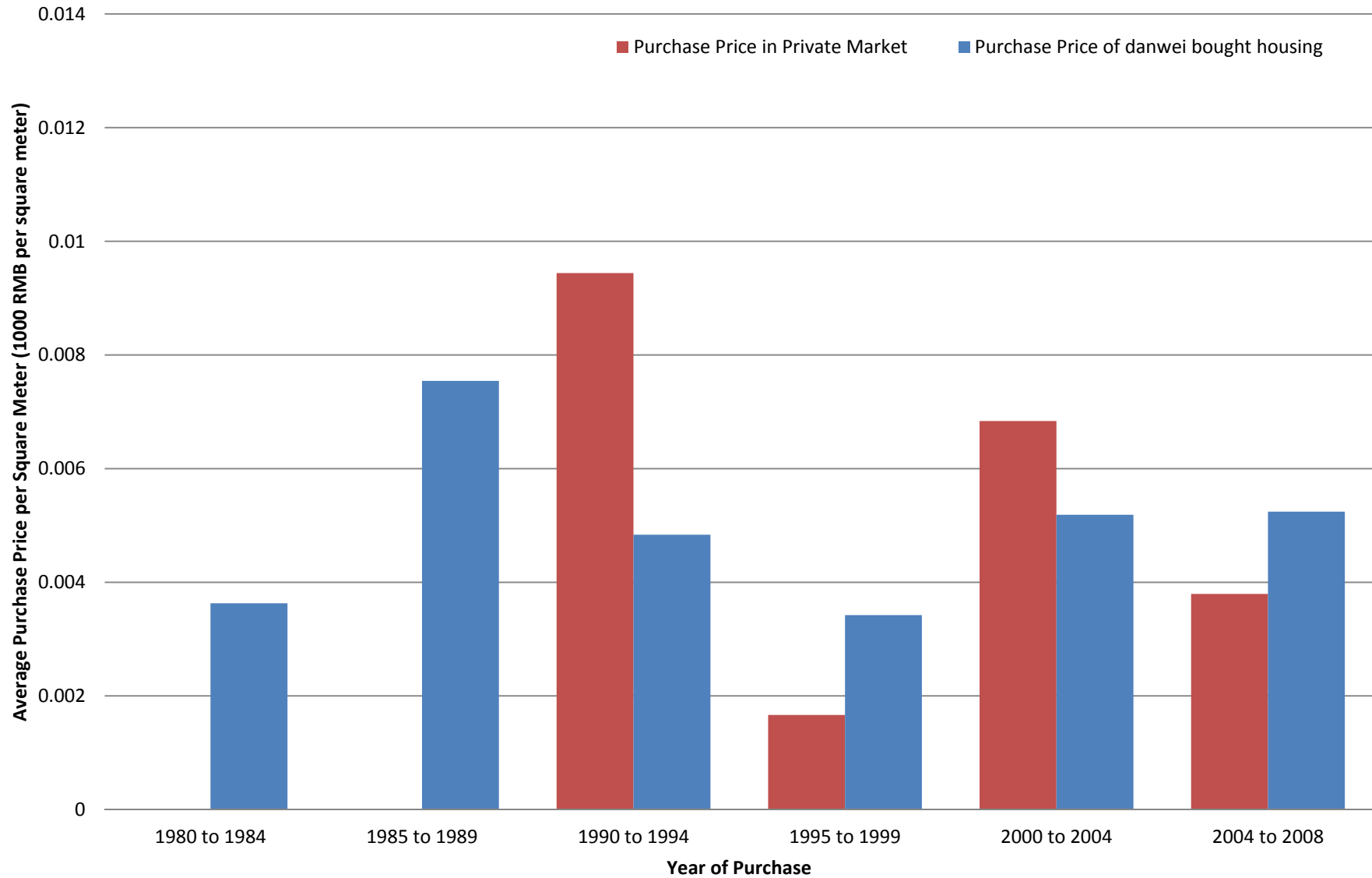
All values are deflated by the urban province-specific CPI, where the 2008 Zhejiang CPI=100. The Brandt-Holtz deflator is used for 1986-2004. For all other years, the urban province-specific CPI is from the China Statistical Yearbooks.

Figure 3a. Purchase Prices of Housing in urban Zhejiang



All values are deflated by the urban province-specific CPI, where the 2008 Zhejiang CPI=100. The Brandt-Holtz deflator is used for 1986-2004. For all other years, the urban province-specific CPI is from the China Statistical Yearbooks.

Figure 3b. Purchase Prices of Housing in urban Gansu



All values are deflated by the urban province-specific CPI, where the 2008 Zhejiang CPI=100. The Brandt-Holtz deflator is used for 1986-2004. For all other years, the urban province-specific CPI is from the China Statistical Yearbooks.

Table 1. Summary Statistics for Non-Resident Adult Children

Variable	Obs	Weight	Non-negative net transfers			
			Mean	Std. Dev.	Min	Max
Net transfers received (RMB)	393	150	1,402.85	3,194.68	-	25,000.00
Gross transfers received (RMB)	393	150	1,447.06	3,250.57	-	25,000.00
Gross transfers given (RMB)	393	150	44.21	245.30	-	2,096.09
Respondent received transfer = 1	393	150	0.55	0.50	-	1.00
Housing wealth (10,000 RMB)	393	150	21.56	33.35	-	200.00
Housing windfall (10,000 RMB)	393	150	10.01	22.25	(4.11)	200.00
Full income (per capita) (RMB)	393	150	18,003.41	31,368.77	(14,210.09)	315,000.10
Per capita household income (RMB)	393	150	17,916.07	30,478.44	(14,000.00)	274,400.00
Non-housing assets (10,000 RMB)	393	150	5.44	74.80	(255.70)	847.39
Respondent lives w/adult child = 1	393	150	0.34	0.48	-	1.00
Number household members	393	150	0.44	0.66	-	3.00
Child lives outside local area = 1	387	148	0.77	0.42	-	1.00
Child lives in same county = 1	387	148	0.73	0.45	-	1.00
Gender of child (male=1, female=2)	393	150	1.51	0.50	1.00	2.00
Married respondent = 1	393	150	0.67	0.47	-	1.00
Household size	393	150	2.48	1.24	1.00	7.00
Year of first housing purchase	208	89	1,994.53	7.67	1,970.00	2,008.00
Household head is male = 1	393	150	0.73	0.45	-	1.00
Age of household head	393	150	66.29	9.88	47.00	89.00
Education of child	393	150	5.35	1.67	1.00	10.00
Child is married = 1	392	149	0.81	0.39	-	1.00
Child is currently working = 1	393	150	0.73	0.44	-	1.00
Age of child	393	150	38.04	10.29	16.00	77.00
Birth order of child	393	150	1.97	1.20	1.00	8.00
Number of non-adult children	393	150	0.03	0.16	-	1.00
Household head employed in public sector = 1	393	150	0.32	0.47	-	1.00
Education of household head	393	150	3.80	2.26	1.00	12.00
Number of adult children	393	150	3.03	1.55	1.00	8.00
Number of adult brothers	393	150	1.14	1.03	-	5.00
Number of adult sisters	393	150	0.89	1.04	-	6.00

Table 2. Effect of Housing Wealth on Transfers with Linear Relationship Assumed

	<u>Non-Negative Net Transfers</u>				<u>Positive Net Transfers</u>			
	<u>Net Transfers</u>		<u>Gross Transfers</u>		<u>Net Transfers</u>		<u>Gross Transfers</u>	
	Tobit	IV Tobit	Tobit	IV Tobit	Tobit	IV Tobit	Tobit	IV Tobit
Housing Wealth	1.245 (6.816)	-3.304 (10.175)	0.638 (6.806)	-2.555 (10.094)	0.487 (7.007)	-1.033 (8.889)	0.612 (6.976)	-0.826 (8.833)
Full Income	-0.020 (0.016)	-0.018 (0.012)	-0.018 (0.015)	-0.017 (0.012)	0.058*** (0.018)	0.058*** (0.021)	0.057*** (0.017)	0.058*** (0.020)
Observations	377	377	377	377	246	246	246	246
<u>First Stage Results of 2SLS: Dependent Variable is Housing Wealth</u>								
Housing Windfall	0.947*** (0.065)		0.947*** (0.065)		1.063*** (0.061)		1.063*** (0.061)	
R-squared	0.8723		0.8723		0.9334		0.9334	

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 F-statistics are not reported for IV Tobit regressions. For the respective 2SLS regressions not shown here, the F-statistics are of similar magnitude to the 2SLS regression shown here for the entire sample of transfers.

Table 3. Effect of Housing Assets on Transfers Received from Children: Conditional Least Squares Model

	All Non-Negative Net Transfers				All Positive Net Transfers			
	Net Transfers		Gross Transfers		Net Transfers		Gross Transfers	
	T-Tobit	IV T-Tobit	T-Tobit	IV T-Tobit	T-Tobit	IV T-Tobit	T-Tobit	IV T-Tobit
Housing Kink Point	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Percentile	48th	48th	48th	48th	48th	48th	48th	48th
Windfall Kink Point		4.00		4.00		4.00		5.00
Percentile		64th		64th		64th		66th
Below kink	-156.315 (116.311)	-475.818** (188.348)	-191.241* (113.064)	-470.331** (185.705)	-285.417** (116.154)	-686.263*** (201.364)	-285.131** (115.053)	-655.892*** (196.864)
Above kink	5.576 (5.733)	-5.776 (10.412)	6.040 (5.650)	-4.914 (10.257)	5.578 (6.033)	-4.299 (9.392)	5.701 (6.105)	-3.948 (9.270)
Full Income per capita	-0.017 (0.016)	-0.003 (0.013)	-0.015 (0.016)	-0.002 (0.013)	0.071*** (0.016)	0.094*** (0.024)	0.070*** (0.016)	0.092*** (0.024)
Observations	377	377	377	377	246	246	246	246
Pseudo R-squared or Chi-squared	0.035	161.2	0.0357	169.8	0.0327	192.6	0.0344	208.5

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Highest Pseudo R-squared or Chi-squared in bold.

Unit of observation is adult non-resident child of main CHARLS respondent. Additional controls: non-housing net assets, household size, number of non-adult children of parents, dummy for married parents, dummy for father being alive & married to mother, age and age squared of father if alive (otherwise mother), dummies for year of housing purchase, whether father (if alive, mother if not) worked for public sector, gender of child, whether child lives outside local neighborhood, education dummies for child and father (if alive, mother if not), whether child is married, whether child is currently working, age and birth order of child, dummies for number of brothers and sisters, community fixed effects. Standard errors of OLS and Tobit regressions are clustered by family (main CHARLS respondent). IVTobit results presented here are similar to IV results with clustered standard errors. All monetary values are in 2008 RMB terms. Where possible, the Brandt-Holz urban spatial deflator was used, otherwise the national urban CPI was used.

Table 4. Effect of Housing Assets on Transfers Received from Children: Conditional Least Squares Model for Housing Wealth and Full Income

	All Non-Negative Net Transfers				All Positive Net Transfers			
	Net Transfers		Gross Transfers		Net Transfers		Gross Transfers	
	T-Tobit	IV T-Tobit	T-Tobit	IV T-Tobit	T-Tobit	IV T-Tobit	T-Tobit	IV T-Tobit
Housing Kink Point	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Percentile	48th	48th	48th	48th	48th	48th	48th	48th
Windfall Kink Point		4.00		4.00		4.00		5.00
Percentile		64th		64th		64th		66th
Below kink	-199.743* (120.704)	-560.698*** (201.950)	-235.842** (117.491)	-554.079*** (198.936)	-249.772** (112.374)	-1,054.070*** (361.584)	-313.758** (123.304)	-1,104.718*** (330.818)
Above kink	2.28 (5.823)	-8.379 (10.708)	2.588 (5.748)	-7.503 (10.534)	7.845 (6.138)	-3.385 (10.087)	3.692 (6.525)	-7.687 (10.057)
Full Income Kink Point	6014	6014	6014	6014	43600	43600	43600	43600
	31st	31st	31st	31st	96th	96th	26th	26th
Below Income Kink Pt.	0.256** (0.110)	0.412*** (0.154)	0.265** (0.110)	0.405*** (0.152)	0.014 (0.048)	0.091 (0.059)	0.250* (0.143)	0.620** (0.263)
Above Income Kink Pt.	-0.020 (0.017)	-0.007 (0.013)	-0.018 (0.016)	-0.007 (0.013)	0.098*** (0.016)	0.094*** (0.030)	0.067*** (0.016)	0.081*** (0.023)
Observations	377	377	377	377	246	246	246	246
Pseudo R-squared or Chi-squared	0.0360	165.3	0.0368	174.4	0.0331	192.6	0.0346	208.1

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Highest Pseudo R-squared or Chi-squared in bold.

Unit of observation is adult non-resident child of main CHARLS respondent. Additional controls: non-housing net assets, household size, number of non-adult children of parents, dummy for married parents, dummy for father being alive & married to mother, age and age squared of father if alive (otherwise mother), dummies for year of housing purchase, whether father (if alive, mother if not) worked for public sector, gender of child, whether child lives outside local neighborhood, education dummies for child and father (if alive, mother if not), whether child is married, whether child is currently working, age and birth order of child, dummies for number of brothers and sisters, community fixed effects. Standard errors of OLS and Tobit regressions are clustered by family (main CHARLS respondent). IVTobit results presented here are similar to IV results with clustered standard errors. All monetary values are in 2008 RMB terms. Where possible, the Brandt-Holz urban spatial deflator was used, otherwise the national urban CPI was used.

Table 5. Determinants of Housing Wealth and Housing Windfall (Respondent Level)

	Housing Wealth		Housing Windfall	
	<u>Non-Negative Net Transfers</u>	<u>Positive Net Transfers</u>	<u>Non-Negative Net Transfers</u>	<u>Positive Net Transfers</u>
Full income per capita (10,000 RMB)	2.371*** (0.886)	1.91 (2.958)	1.143 (0.706)	0.164 (2.354)
Non-housing assets	0.023 (0.033)	0.846** (0.371)	0.019 (0.027)	0.768** (0.295)
Married Respondent	-6.538 (13.418)	1.891 (44.172)	-7.443 (10.688)	-1.776 (35.155)
Household Size	-0.372 (2.600)	-1.481 (4.681)	-0.962 (2.071)	0 (3.726)
% children living outside area	-0.042 (0.096)	-0.034 (0.160)	-0.049 (0.076)	-0.12 (0.127)
Made housing purchase = 1	-3.56 (16.078)	-2.437 (21.155)	7.47 (12.806)	7.689 (16.837)
Housing purchase in 1980-84	-2.023 (14.608)	-13.272 (24.288)	16.541 (11.636)	7.344 (19.330)
Housing purchase in 1985-89	-10.156 (11.310)	-10.001 (18.992)	3.381 (9.008)	6.608 (15.115)
Housing purchase in 1990-94	9.865 (8.773)	26.831 (17.514)	21.719*** (6.988)	37.757*** (13.939)
Housing purchase in 1995-99	5.422 (7.879)	6.845 (12.139)	20.057*** (6.276)	15.691 (9.661)
Housing purchase in 2000-04	-5.238 (9.913)	-14.038 (15.877)	8.543 (7.896)	7.045 (12.636)
Housing purchase in 2005-09	11.405 (14.029)	9.855 (19.974)	12.896 (11.174)	5.024 (15.896)
Household head is male = 1	10.583 (13.876)	-3.78 (42.327)	9.621 (11.053)	-1.059 (33.686)
Age of household head	2.142 (3.614)	-6.536 (6.297)	2.198 (2.878)	-3.07 (5.011)
Age of household head squared	-0.019 (0.027)	0.046 (0.045)	-0.014 (0.021)	0.029 (0.036)
Mean children's education	2.486 (2.725)	-1.02 (4.915)	0.513 (2.170)	-2.986 (3.911)
Percent married children	-0.089 (0.113)	-0.192 (0.187)	-0.005 (0.090)	-0.027 (0.149)
Percent working children	0.058 (0.102)	-0.082 (0.214)	0.039 (0.081)	0.047 (0.171)
Mean age of children	0.462 (0.840)	0.097 (1.458)	-0.539 (0.669)	-1.263 (1.161)
Number of non-adult children	2.791 (17.262)		3.392 (13.750)	
Number of adult daughters	6.355** (2.517)	7.042* (3.915)	1.333 (2.005)	1.377 (3.115)
Number of adult sons	8.200*** (2.979)	3.614 (5.067)	3.37 (2.372)	-1.669 (4.033)
Household head employed in public sector = 1	2.007 (6.120)	11.776 (10.177)	1.566 (4.875)	5.783 (8.099)
Observations	151	98	151	98
R-squared	0.5739	0.687	0.3924	0.5557

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 Additional controls include household head education dummies and community fixed effects.

Table 6. Non-Linear Effect of Housing Wealth on Child Characteristics, Sample includes non-negative net transfers

	<u>All Adult Children</u>		<u>All Non-Resident Adult Children</u>													
	<u>Likelihood child lives with parent</u>		<u>Likelihood child lives outside parent's area</u>				<u>Likelihood child is working</u>		<u>Education of Child</u>		<u>Age of Child</u>		<u>Birth Order of Child</u>		<u>Married Child</u>	
	IV		IV		IV		OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	Probit	IV Probit
	Probit	Probit	Probit	Probit	Probit	Probit										
Housing Wealth (below kink)	-0.048 (0.060)	0.063 (0.163)	0.043 (0.035)	-0.142 (0.090)	0.081* (0.043)	0.077 (0.112)	0.034 (0.035)	0.077 (0.057)	0.06 (0.106)	-0.144 (0.223)	0.004 (0.022)	-0.045 (0.048)	0.163 (0.123)	-0.243 (0.350)		
Housing Wealth (above kink)	0.005 (0.004)	0.003 (0.010)	-0.004 (0.004)	-0.008 (0.005)	-0.002 (0.005)	0.005 (0.008)	0 (0.003)	-0.002 (0.003)	-0.008 (0.008)	-0.025** (0.011)	-0.002 (0.002)	-0.006** (0.002)	-0.035** (0.017)	-0.096** (0.047)		
Observations	367	367	341	341	354	354	377	377	377	377	377	377	223	223		
R-squared							0.5395	0.5365	0.907	0.9033	0.7523	0.7422				
F-statistic								18.84		17.67		18.06				

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 First stage results are not shown here as they are qualitatively similar to the first stage results when the dependent variable is transfers. Optimal kink point found in main regressions is used here. Additional controls are the same as those in the main regressions. For this reason, there is a smaller sample size than one might expect in the regressions on the likelihood that the child lives with the parent; community fixed effects are included in these regressions.

Table 7. Does Sibling Competition Influence Transfers to Parents?

	Non-Negative Net Transfers				Positive Net Transfers			
	Net Transfers		Gross Transfers		Net Transfers		Gross Transfers	
	Tobit	IV Tobit	Tobit	IV Tobit	Tobit	IV Tobit	Tobit	IV Tobit
Housing Wealth Below Kink	513.343 (341.055)	-2,279.468** (985.724)	546.013 (344.763)	-2,383.520** (976.560)	-323.009 (448.337)	-2,317.375* (1404.544)	-331.824 (402.522)	-2,425.408* (1409.494)
Wealth Below Kink x One Sibling	-698.027* (418.151)	1,835.32 (1191.470)	-702.153* (419.852)	2,030.792* (1179.654)	-82.891 (398.885)	965.024 (2078.807)	-49.302 (333.935)	1,321.41 (2086.133)
Wealth Below Kink x 2 Siblings	-580.494* (341.664)	2,379.785** (1063.011)	-640.180* (343.276)	2,495.176** (1052.129)	161.123 (435.452)	1,976.05 (1490.960)	111.607 (356.937)	2,110.34 (1496.214)
Wealth Below Kink x 3+ Siblings	-670.126* (341.988)	1,719.553* (1001.016)	-743.137** (345.747)	1,824.458* (993.228)	38.769 (449.452)	1,523.27 (1226.901)	85.584 (386.843)	1,609.75 (1231.225)
Housing Wealth Above Kink	-18.787 (59.568)	-188.233* (110.906)	-0.023 (0.015)	-185.372* (99.834)	70.945 (63.041)	80.95 (226.050)	103.185* (59.204)	61.387 (226.847)
Wealth Above Kink x One Sibling	55.369 (65.216)	216.356* (117.042)	43.931 (64.978)	208.329* (108.550)	-50.052 (61.863)	-53.713 (123.398)	-96.928* (54.642)	-70.178 (123.833)
Wealth Above Kink x 2 Siblings	17.518 (60.345)	171.863 (110.503)	11.327 (60.855)	169.424* (99.453)	-85.874 (64.066)	-102.266 (223.647)	-121.823** (59.972)	-82.743 (224.435)
Wealth Above Kink x 3+ Siblings	34.256 (59.765)	174.293 (109.303)	30.246 (60.328)	176.934* (98.489)	-34.728 (67.604)	-90.275 (209.159)	-100.636 (71.126)	-69.25 (209.896)
Full Household Income	-0.024 (0.015)	0.001 (0.018)	-12.552 (60.011)	0 (0.018)	0.067*** (0.022)	0.109*** (0.034)	0.068*** (0.022)	0.108*** (0.034)
Observations	377	377	377	377	246	246	246	246

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 Additional regressors as in main regressions.

Table 8. Sensitivity Analysis: Kinked Regressions (same kink point as in main regressions)

	Non-Negative Net Transfers				Positive Net Transfers			
	Net Transfers		Gross Transfers		Net Transfers		Gross Transfers	
	Tobit	IV Tobit	Tobit	IV Tobit	Tobit	IV Tobit	Tobit	IV Tobit
	<i>Main regressions</i>							
Housing Wealth Below Kink	-156.315 (116.311)	-475.818** (188.348)	-191.241* (113.064)	-470.331** (185.705)	-285.417** (116.154)	-686.263*** (201.364)	-285.131** (115.053)	-655.824*** (198.740)
Housing Wealth Above Kink	5.576 (5.733)	-5.776 (10.412)	6.04 (5.650)	-4.914 (10.257)	5.578 (6.033)	-4.299 (9.392)	5.701 (6.105)	-3.947 (9.270)
Full Household Income	-0.017 (0.016)	-0.003 (0.013)	-0.015 (0.016)	-0.002 (0.013)	0.071*** (0.016)	0.094*** (0.024)	0.070*** (0.016)	0.092*** (0.024)
Observations	377	377	377	377	246	246	246	246
	<i>Additional regressor included: parent lives with an adult child</i>							
Housing Wealth Below Kink	-130.458 (116.590)	-450.006** (195.089)	-168.642 (112.899)	-446.573** (192.335)	-280.795** (122.863)	-719.560*** (218.333)	-280.859** (121.755)	-686.662*** (215.323)
Housing Wealth Above Kink	5.885 (5.523)	-5.895 (10.309)	6.322 (5.538)	-5.01 (10.161)	5.541 (5.983)	-4.274 (9.450)	5.666 (6.059)	-3.925 (9.319)
Live with adult child	-1,440.874* (793.243)	-815.743 (940.821)	-1,328.428* (779.048)	-773.999 (929.137)	-184.833 (528.891)	658.612 (1007.450)	-170.819 (536.750)	609.978 (993.560)
Full Household Income	-0.013 (0.016)	-0.001 (0.013)	-0.012 (0.016)	0 (0.013)	0.071*** (0.016)	0.095*** (0.024)	0.070*** (0.016)	0.093*** (0.024)
Observations	377	377	377	377	246	246	246	246
	<i>Sample includes only those children whose parents do not live with any adult children</i>							
Housing Wealth Below Kink	-199.408*** (23.084)	-1,301.555*** (326.872)	-256.310*** (22.937)	-1,343.954*** (323.415)	-369.694** (179.064)	-1,040.026*** (268.365)	-368.999** (175.415)	-1,020.927*** (265.146)
Housing Wealth Above Kink	3.920* (2.023)	-13.516 (14.320)	2.608 (2.054)	-15.437 (14.182)	5.512 (7.366)	-6.935 (11.561)	4.666 (7.486)	-7.823 (11.422)
Full Household Income	-0.024*** (0.006)	0.004 (0.030)	-0.023*** (0.006)	0.005 (0.029)	0.048** (0.022)	0.058* (0.032)	0.044** (0.021)	0.054* (0.032)
Observations	278	278	278	278	202	202	202	202

Table 8. Sensitivity Analysis: Kinked Regressions (same kink point as in main regressions)

	Non-Negative Net Transfers				Positive Net Transfers			
	Net Transfers		Gross Transfers		Net Transfers		Gross Transfers	
	Tobit	IV Tobit	Tobit	IV Tobit	Tobit	IV Tobit	Tobit	IV Tobit
<i>Main regressions</i>								
Housing Wealth Below Kink	-156.315 (116.311)	-475.818** (188.348)	-191.241* (113.064)	-470.331** (185.705)	-285.417** (116.154)	-686.263*** (201.364)	-285.131** (115.053)	-655.824*** (198.740)
Housing Wealth Above Kink	5.576 (5.733)	-5.776 (10.412)	6.04 (5.650)	-4.914 (10.257)	5.578 (6.033)	-4.299 (9.392)	5.701 (6.105)	-3.947 (9.270)
Full Household Income	-0.017 (0.016)	-0.003 (0.013)	-0.015 (0.016)	-0.002 (0.013)	0.071*** (0.016)	0.094*** (0.024)	0.070*** (0.016)	0.092*** (0.024)
Observations	377	377	377	377	246	246	246	246
<i>Regressions include interaction between housing wealth & living in same city as parents</i>								
Housing Wealth Below Kink	147.292 (177.879)	-433.378* (258.036)	76.537 (163.147)	-465.739* (254.007)	-90.803 (151.744)	-854.709*** (323.543)	-91.996 (151.007)	-822.863** (319.568)
Housing Wealth Above Kink	3.068 (12.677)	-22.588 (21.568)	2.971 (12.274)	-21.166 (21.269)	0.407 (8.307)	-12.082 (18.899)	0.783 (8.426)	-10.667 (18.667)
Live in same city = 1	1,025.95 (727.013)	-766.882 (1252.347)	673.953 (622.415)	-1,130.09 (1223.078)	180.216 (887.919)	-2,319.11 (1766.601)	232.463 (881.178)	-2,221.55 (1744.894)
Interaction w/wealth below kink	-378.290** (146.432)	3.591 (233.216)	-332.562** (136.688)	49.09 (229.244)	-231.45 (144.436)	197.325 (296.105)	-229.18 (142.800)	194.809 (292.466)
Interaction w/wealth above kink	5.47 (11.675)	19.401 (19.879)	5.973 (11.366)	18.762 (19.632)	7.271 (7.615)	8.991 (16.549)	6.918 (7.620)	7.83 (16.346)
Full Household Income	-0.019 (0.015)	-0.005 (0.014)	-0.017 (0.015)	-0.004 (0.014)	0.066*** (0.017)	0.096*** (0.025)	0.066*** (0.016)	0.094*** (0.024)
Observations	372	372	372	372	244	244	244	244
<i>No imputed values for housing wealth or windfall</i>								
Housing Wealth Below Kink	-171.234*** (20.918)	-585.265*** (203.518)	-205.812*** (20.733)	-582.697*** (200.350)	-307.632** (122.528)	-609.590*** (211.663)	-306.937** (121.351)	-576.060*** (209.121)
Housing Wealth Above Kink	6.926*** (1.353)	-5.75 (10.969)	7.440*** (1.346)	-4.741 (10.793)	8.212 (5.166)	2.549 (8.899)	8.361 (5.229)	2.912 (8.792)
Full Household Income	-0.015*** (0.003)	0.002 (0.014)	-0.014*** (0.003)	0.002 (0.013)	0.066*** (0.017)	0.083*** (0.024)	0.065*** (0.016)	0.081*** (0.024)
Observations	368	368	368	368	241	241	241	241

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 Additional regressors as in main regressions.