

How Well Do Children Insure Parents Against Low Retirement Income? An Analysis Using Survey Data from Urban China*

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Abstract

As population aging becomes more pronounced in the developing world, the uneven implementation of social safety nets raises important questions as to how well traditional family-based mechanisms insure elderly incomes when pension systems fail. Using a unique dataset from a recent household survey conducted in urban China, we find evidence that private transfers respond to low household income of retired workers when income falls below the poverty line. This finding is consistent with an altruistic motive for transfers at low levels of household income. At the same time, however, the transfer response to elderly pre-transfer income is not sufficient to fully cover shortfalls that arise with severe pension arrears and low retirement income.

Key Words: Transfers, Pensions, Retirement, Elderly Welfare, China

JEL Codes: D64, H55, J14, O12, P35, P36

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1 Introduction

In many countries across the developing world, the introduction of public social insurance and pension systems is growing in importance as rapid demographic transition and urbanization place traditional extended family support mechanisms under increasing pressure. New pension systems are difficult to implement smoothly, however, in a regulatory environment in which employers and employees alike find it advantageous to opt out of “mandatory” participation. Non-compliance in new pension systems may be exacerbated if future support is viewed as uncertain when benefits evaporate with firm bankruptcy or with the inability of the government to collect mandated contributions from current employers. In such a setting, transfers from non-resident adult children may provide insurance against low retirement income.

Urban China presents an interesting environment in which to study the willingness of adult children to support parents facing failure of public or enterprise-based pension systems. First, while pension coverage was quite high prior to reform of the state sector, reform of loss-making enterprises has occurred simultaneously with piecemeal development of a de facto pay-as-you-go (PAYG) system in which current workers support current retirees. A significant share of retirees face pension arrears with bankruptcy of former employers, and for these elderly problems with arrears or non-payment can be expected to last into the indefinite future. Second, fertility controls and increases in life expectancy have accelerated the pace of demographic change in China. Given the expected increases in the elder share of China’s population, it is generally acknowledged that the current PAYG system is not sustainable (World Bank, 1997; Whiteford, 2001; and Murton, 2002), and there is considerable uncertainty as to how well traditional family-based informal mechanisms of support for the elderly can be expected to perform if the PAYG system should fail.

In this paper we use data from urban China to examine the responsiveness of family transfers to low levels of income per capita in retiree households. Where studies of private transfers are typically concerned that expanded public transfers may “crowd out” private transfers and weaken the distributive impact of new public safety nets, we are motivated to look into the public-private relationship from a somewhat different angle: we want to determine the extent to which private transfers respond to failure of China’s city-based pension schemes, and whether altruistically motivated private transfers insure retirees against low income in old age. We find evidence that family

transfers to households with elderly residents respond to pre-transfer income, but even at low levels of pre-transfer income, private net transfers into the household are not crowded out with increasing retirement income, suggesting that retirees are far from fully insured against pension system failure. Results from our least restrictive model show that at income levels below half the average urban poverty line, net transfers into households increase by 0.20 to 0.26 yuan per capita for each one yuan reduction in income. Responsiveness falls as income increases so that transfers increase by only 0.10 to 0.16 yuan for a 1 yuan decline in the neighborhood of the poverty line, and fall further to 0.06 to 0.08 by pre-transfer income equal to twice the poverty line. A more restrictive fully parametric estimate suggests that, at cutoffs well below the poverty line, transfers into the household increase by 0.52 to 0.68 yuan per capita for each one yuan reduction, but that above this low cutoff responsiveness to income is close to zero. For current retirees, transfers far from fully insure households with elderly against low retirement income.

The literature on intra-family transfers has focused primarily on efforts to distinguish altruistic and exchange motives for transfers (Barro, 1974; Becker, 1974; Cox, 1987). Much of the empirical research in the US has suggested that inter-generational inter-vivos transfers are compensatory (e.g., Cox and Rank, 1992; McGarry, 1999) rather than based on altruistic motives. It is important to remember, however, that in the US, the social security safety net provides substantial insurance against poverty in old age, and thus it is not as surprising to find an emphasis in the US on the flow of resources from older to younger generations. In this paper, we follow an approach developed by Cox, Hansen, and Jimenez (2004) that allows for both altruistic and exchange motives to be present in the transfer decision, with potential differences in the strength of each motive at different levels of pre-transfer household income. We first estimate responsiveness of transfers using the parametric threshold model introduced by Cox et al (2004), and then show results using a semi-parametric partial linear model (Yatchew, 1998; Yatchew, 2003), which imposes less structure on the relationship between net transfers and pre-transfer income. The semi-parametric model suggests a smoother transition from a dominant altruistic motive to exchange based motives for transfers than found using the parametric threshold model.

While understanding the role of private transfers in China is of crucial importance for gauging the impact of pension system reform on the well-being of China's elderly, intra-family transfers in

China have received very little attention in the literature. Benjamin, Brandt, and Rozelle (2000) present results suggesting that traditional values of “filial piety” cannot be relied upon to stimulate support of elderly in rural China. White (1998), Shang (1999), Chow (2000), and Saunders, Shang, Zhang, and Sun (2003) provide descriptive discussions of old age support, but do not present any analyses of the significance of intra-family transfers for old-age support in urban China.

Our analyses benefit from availability of a unique data source that includes information on all resident and non-resident children of the household, and information about the health status of household members. Detailed knowledge of the family transfer network allows us to control for factors missing from many data sources such as the number of adult children and their average education and age, regardless of whether or not they currently reside in the household. Household composition and the decision to live with an adult child may be confounded with the decision of the child to provide support, and indeed, co-residence may reflect transfers to either the older or younger generation or an exchange across generations. When we examine this possibility, we find that co-residence is only systematically related to pension receipts at high levels of pension income per retiree, suggesting that, after conditioning on other elderly characteristics, co-residence reflects a net transfer to adult children in households with high income elderly.

In the next section, we provide background information on demographic and institutional changes that have affected levels of old-age support in urban China. In Section 3 we discuss the China Urban Labor Survey (CULS) dataset and its relative strengths for our analyses. Section 4 introduces the theoretical background and empirical approaches used to study transfer behavior. Results of our analyses are presented in section 5, and we discuss policy implications in a concluding section.

2 Background

Pension support was an important benefit provided by state-owned enterprises (SOEs) prior to initiation of economic reform, and for this reason, it is natural to find the history of pension system reform intertwined with that of SOE reform. Under the pre-reform system, SOEs transferred profits to the state, and the state financed the pension system. With early reforms of SOEs in the 1980s, state enterprises were first allowed to retain profits, but in return, they accepted responsibility

for providing pensions to their retired workers. Since the early 1990s, many SOEs have gone through restructuring or fallen into bankruptcy, rendering them incapable of meeting their pension responsibilities.¹

Non-payment of pensions and significant pension arrears are already creating hardship for current retirees. In the five cities where the survey used in this paper was conducted, 10.4 percent of formal retirees reported significant pension arrears in 2001, and in Shenyang the share reporting pension arrears was over 26 percent.² Dislocation and hardship created by arrears are often further compounded by failure of public health insurance programs to reimburse retirees for health-related expenditures. In fact, retirees with health reimbursement arrears make up a significant share of those nominally covered by an insurance program.

The implications of SOE restructuring for pension reforms was not lost on China's reformers. To reduce the risk of widespread failure of the pension system, reforms were introduced in 1995 and revised in 1997. Under the new system, individuals and enterprises directly contribute to locally administered pension funds and the government's long run objective is to turn these funds into a fully funded individual account system. The new system, however, faces two significant challenges. First, noncompliance is common, particularly for private firms. Evidence from a recent 14-city survey of participation in safety net programs highlights the problem. Where 84 percent of employees from government offices and state or collective enterprises report participating in mandatory employer-based pension schemes, only 41 percent of employees from private sector firms report that they and their firms are participating in this program.³ Second, for many individuals, especially those who spent part or most of their working life under the old system with expectation of a full pension provided by the state, there is insufficient time to save enough to support themselves in old age. Due to these two challenges, it is common to hear reports that the current pension system, which is a de facto PAYG system, will generate a shortfall of roughly 3.7 trillion yuan (451 billion dollars) over the next 30 years (Holland, 2002). A projected shortfall of this level makes it unlikely that China will be able to move to a genuine individual account system, and the survey

¹Indeed, the larger pool of retirees that must be supported by older enterprises places them at a significant competitive disadvantage relative to younger enterprises.

²Table A.1 in the downloadable supplementary appendix (<http://www.msu.edu/~gilesj/cgm1append.pdf> or <http://rspas.anu.edu.au/~u9101876/>) presents a more complete breakdown of pension and health insurance reimbursement arrears.

³See Table A.2 in the supplementary appendix for additional descriptive statistics.

data we use suggest that shortfalls in collection and bankruptcies of SOEs are already contributing to a significant pension arrears problem.⁴

Pressures on China’s pension system are likely to worsen in the more distant future because successful efforts to limit fertility have contributed to the dramatic aging of China’s population. Birth rates first started to fall with the “*later, longer, fewer*” campaign of the 1970s and then this decline became more dramatic with implementation of the “*one-child policy*” in 1979.⁵ By 2000, China’s population pyramid was nearly diamond shaped. Within 20 to 30 years, as China’s baby boom generation born in the 1960s reaches retirement, the country is likely to have an inverted population pyramid.⁶ A small labor force will have to support a much larger elderly population, implying that the current strained PAYG system will face even more serious problems as the ratio of pensioners to pension contributors increases. According to our estimates, the ratio of retirees to working age adults will increase from roughly 20 percent in 2000 to 45 percent by 2020. To put the scale of this change in perspective, in the US, where there are concerns over strains that the social security system will face with retirement of the baby boom generation, the retiree-working age population ratio was 14.4 in 2000 and projected to rise to 19.6 by 2020.⁷ The sharp demographic transition in China will place far more strain on a system that is incompletely implemented and already facing serious difficulties providing mandated levels of support to retirees.

3 Transfers, Incomes and Attitudes Recorded in the China Urban Labor Survey

The data used in this paper are from the China Urban Labor Survey (CULS), which was conducted in 2001 and 2002 by the Institute for Population and Labor Economics at the Chinese Academy of

⁴Generally speaking, a PAYG system is not necessarily a bad design for a public pension program provided that population aging is not significant, or if it is, that the working age population is willing to pay higher taxes necessary to support a growing pool of retirees. In the pre-reform era, urban residents in China enjoyed what was effectively a PAYG system at a time when it was sustainable over the short-run. From 1953 to 1982, the population of elderly increased slightly as a share of the total population, and at the same time, the central government had the power to act as an income redistribution agency. Neither of these conditions hold in China of the early 21st century. Sufficiently high income growth could save the PAYG system, but most observers believe it to be highly unlikely that China can sustain sufficiently high growth rates long enough to grow out of this problem (World Bank, 1997).

⁵Li, Zhang and Zhu (2005) present differences-in-differences estimates showing that fertility controls did indeed help to drive China’s demographic transition.

⁶In Figure A.1 of the supplementary appendix, we show the evolution of China’s population pyramid over time.

⁷Calculated from projected growth of elderly and total populations of the US found at www.census.gov.

Social Sciences.⁸ The survey covers five large urban cities, including Shanghai, Wuhan, Shenyang, Fuzhou, and Xian. Within each city, a proportional population sampling approach was used to sample an average of 10 registered urban households in each of 70 neighborhood clusters. Each household head was asked questions about the family and then all family members above age 16 who were no longer in school were interviewed individually. The urban resident survey consists of four instruments: a household questionnaire, an individual questionnaire, a community (neighborhood) questionnaire, which were part of the survey conducted in the Fall 2001, and a follow-up supplemental survey was carried out in the same households during the Fall 2002. The follow-up includes modules on labor force participation, pensions and elder support, and an adult cognitive ability test. The five-city urban resident sample includes 3499 households and 8109 individuals over age 16 and out of school. In the follow-up survey, 7184 individuals were successfully recontacted, with an overall attrition rate of 11.4 percent. Because the follow-up survey failed to enumerate all components of income, the analyses in this paper make use of the more comprehensive 2001 survey.⁹

The survey has several interesting features useful for analysis of transfers. In addition to detailed information on household income, expenditures, intra-family income transfers, and living arrangement information, the survey includes detailed information on living children and siblings of household members. This feature of the CULS is important because we can directly observe the non-resident family network that is a potential source of transfers. In particular, it is possible to control directly for both the size (number and gender of children and siblings) and the quality (educational attainment) of the transfer network. In most household surveys, by contrast, the size and character of the family transfer network is omitted, and this leads one to worry that unobservables related to the network may bias analyses of transfer behavior.

We compare the demographic characteristics of respondents in the CULS to that of the 0.1 percent sample from the 2000 census in Figure 1. The CULS enumerated all individuals living in households who were over 16 and no longer enrolled in school, and in panel A we exclude children and residents still in school from the census in order to compare the age distribution of the CULS

⁸All three authors participated in the design, implementation and administration of the survey.

⁹More detailed information on the survey can be found in Giles, Park and Cai (2006) and translation of survey instruments can be found at www.msu.edu/~gilesj/.

and the census. We find that the mean age in the CULS is five years older than the population census. Given that the CULS sampled through neighborhood committees and likely missed many younger workers living in dormitories, we believe that this difference in the average age of the sample is not cause for worry in an analysis of transfers received by retirement age workers. A more significant concern would arise if we missed significant numbers of institutionalized elderly living in assisted living residences, retirement or nursing homes. The elder care service sector is not yet well developed in China, and a comparison of the age distributions of the over-45 population from the CULS and the census, respectively, in panel B of Figure 1, shows no evidence that the CULS might be excluding the institutionalized elderly. We observe a statistically insignificant difference in mean age of the over-45 distributions, and moreover, the distributions nearly overlap.

In our analyses, we focus on transfers to households with at least one individual over mandatory retirement age. Since we are particularly interested in responsiveness of transfers to pension income, we define elderly as residents over mandatory retirement age and potentially eligible for a full pension, which is 55 for women and 60 for men. The population over legal retirement age comprises 28.5 percent of our sample, 58.9 percent of whom are women. Overall, 35 percent of our sample are retired as of November 2001, and nearly 60 percent of retirees are women. While the higher share of women in retirement can be explained in part by an earlier mandatory retirement age, many middle-aged workers also faced the alternative of accepting either early retirement or layoff, and women make up a larger share of early retirees.¹⁰ We focus on men and women over their respective mandatory retirement ages because these individuals have fewer options to reenter the labor force. Among this group 85 percent of women and 98 percent of men were eligible for pension benefits.

In the 2001 CULS, 41 percent of households have at least one older person over the mandatory retirement age. For the purposes of our analyses, we split living arrangements into four distinct categories: *living alone*, *living with one's spouse*, *living with at least one adult child* (including the child's family members if married), and *living with individuals other than spouse and adult children*. Among the 2321 elderly, 53 percent are either living alone or with their spouses, 45.5

¹⁰Early retirement frequently carries access to permanent (if reduced) pension payments, whereas unemployment benefits for laid off workers are lower and limited to three years of support. Middle-aged workers with a choice typically opt for early-retirement, but the majority of early retirees report that their retirement was "involuntary" (Giles et al, 2006).

percent are living with an adult child, and 1.5 percent are living with people other than their spouse or children.¹¹ Since there are very few observations in this latter group, we exclude them from our analyses below. Relative to developed countries, the share of elderly living with children or others is quite high. In the US, for example, the proportion of those over 60 who live with their adult children was only 25 per cent in 1993 (Ulker, 2003). Compared to other Asian economies, however, household sizes are smaller and we observe fewer extended families. For example, in Taiwan the proportion of elderly living with adult children was as high as 64 per cent in 1996 (Kan, Park, and Chang, 2001), and in Indonesia the proportion was 62.5 percent in 1993 (Cameron, 2000).

The CULS has multiple observations per household, but for our analyses we reduce to one observation based on information about the oldest individual in the residence unit who is above the mandatory retirement age and household information calculated from each individual survey form and the household survey. After selecting households based on age of oldest retirement-age resident, and dropping the 36 individuals who report *living with others*, we are left with 1344 observations.

We summarize per capita transfers and other important income components in Table 1. On average, younger households receive more transfers than those with a resident above legal retirement age, and those households with elderly residents transfer out somewhat more than they receive. The proportion of households receiving transfers in the CULS is considerably lower than observed by Cox, Hansen and Jimenez (2004) in data from the Philippines. In all likelihood, this difference is driven by the fact that many urban households in the Philippines have family members working in foreign countries, and as a result, nearly 20 percent of the urban sample reported remittances from overseas.¹²

In Figure 2, we plot average per capita transfers-in and transfers-out as a function of pre-transfer income and observe that both appear to have non-linear relationships with reported pre-transfer income. Not surprisingly, poor households receive more than they give and rich households reported giving more than they receive. With regard to net transfers, households in the first income decile receive on average 319 yuan per capita, while households in the wealthiest income decile transfer

¹¹More detail on the distribution of the sample among these categories is shown in Table A.3 of the supplementary appendix.

¹²Monetary transfers are far more salient in the minds of survey respondents than transfers in-kind in the form of meals received as guests or gifts of food or used clothing. Low value in-kind transfers are likely to be under-reported in the CULS and contribute to the number of “zeros” reported for both transfers-in and out of the household.

out an average of 634 yuan per capita. Figure 3 presents net income transfers for households with and without elderly members. Poor households with elderly members receive considerably higher average private transfers than poor households without elderly members.

The 2002 follow-up survey included subjective questions that are informative of opinions toward elder support. When asked who should bear responsibility for supporting the elderly, the majority of respondents suggested that either the government, children or some combination should take some responsibility, while fewer than 15 percent claimed that the elderly themselves should be financially responsible for their own support. In fact, roughly 60 percent of respondents believe that adult children of elderly have some role to play in supporting their parents. When asked whether they are “willing to support parents or in-laws financially if they need help,” over 90 percent of respondents answered yes and this response did not vary across age groups.¹³

4 Theoretical Background and Empirical Approach

Transfer Derivatives and Altruistic Transfers

Given the purported willingness of all cohorts to support parents in their old age and the remaining legal provisions in China’s Family Law exhorting younger generations to care for their elders, it is an important policy matter to determine the extent to which intergenerational altruism can make up for formal sources of support. We know from Becker (1974) and Cox (1987) that transfers may reflect altruistic or exchange motives or some mixture of the two. We follow Cox et al (2004) and frame our analysis in the context of a utility function that captures the potential for both altruistic and exchange motives in transfers between parents and children. We assume that the utility of individual i , U_i , incorporates the well-being of her relative, V_{ir} :

$$U_i = U(C_i, s, V(C_{ir}, s, U_i)) \tag{1}$$

C_i and C_{ir} are consumption levels for individual i and her relative, ir , respectively. Services provided by relative ir to i as part of an exchange relationship are denoted by s . Individuals care about each other, so $\partial U/\partial V > 0$ and $\partial V/\partial U > 0$, and suggest the possibility that we may observe

¹³For more detail, see Tables A.4 and A.5 of the supplementary appendix.

altruistic transfers. Exchange motives may be present as well if i values services from ir , $\partial U/\partial s > 0$ and ir 's utility falls with provision of services, $\partial V/\partial s < 0$. Assuming away saving for simplicity, the budget constraint for individual i can be written:

$$C_i = I_i + T_i^I - T_i^O \quad (2)$$

where T_i^I is the value of transfers received, T_i^O is value transferred out and I_i is the value of pre-transfer income. If transfers are altruistically motivated, we expect $\partial T_i^I/\partial I_i < 0$, since donors believe that more transfers will be necessary to improve recipient welfare as pre-transfer income falls, while if transfers are exchange motivated, the sign will be ambiguous. When parents are experiencing non-payment or arrears in pensions, or lack pension support altogether, then we expect transfers may flow to them out of altruistic motivations. Once parent welfare improves beyond a certain point, transfers are more likely to reflect intergenerational exchange. Responsiveness of transfers out to household income, $\partial T_i^O/\partial I_i$, should be positive when transfers are altruistically motivated, and when parent income realizations are low and altruistic non-resident family recipients reduce demand for transfers. In this case, theory suggests a net-transfer in function for the elderly:

$$T_i^N = f(I_i) + \mathbf{X}_i' \gamma + \varepsilon_i \quad (3)$$

where T_i^N are net transfers in, or $T_i^I - T_i^O$, I_i is a measure of pre-transfer income, and \mathbf{X}_i is a vector of other exogenous variables which influence levels of transfers in and out of the household. Of particular import for study of transfer behavior, we include as regressors the *number of children*, which captures the effect of the potential transfer network size, and *average age* and *average education level* of children, which proxy for quality of the transfer network. To the extent that some transfers out of the household may be payments for support that cannot be adjusted with pre-transfer income, we examine responsiveness of gross transfers in as a robustness check.¹⁴

The theoretical framework that we adopt from Cox et al (2004) suggests a change in the transfer derivative (or, $\partial T_i^N/\partial I_i$) upon a switch from altruistic to exchange motives. As a result, after

¹⁴One obvious candidate for a non-adjustable transfer out might be payments for college tuition or related expenses, but these expenses are not counted as transfers because the CULS explicitly asks about tuition and related education expenditures of resident and non-resident children.

conditioning on other factors affecting level of transfers, we expect that the functional relationship between net-transfers and pre-transfer income, $f(I_i)$, should be non-linear in pre-transfer income, I_i . We estimate the transfer derivative using two alternative strategies. First, we follow Cox et al (2004) and implement a conditional least squares threshold model. Next we use a less restrictive partial linear model and calculate average transfer derivatives in the neighborhood of different multiples of the average official poverty line.

The idea behind the conditional least squares strategy is straightforward. If there is a threshold level of income ($I = K$) at which point the dominant motive for transfers switches, then we would expect the slope on pre-transfer income to differ depending on whether we are above or below the threshold, K as in (4) below.

$$T_i^N = \beta_0 + \beta_1 \min(I_i, K) + \beta_2 \max(0, I_i - K) + \mathbf{X}'_i \alpha + u_i \quad (4)$$

If K is known, then a continuous linear spline model could be estimated. In our analyses, however, K is unknown and it is a parameter of interest because it provides an estimate of the cutoff level of income where altruistic transfers do not respond strongly to the needs of parents. A first step of the estimation procedure involves finding the threshold K which best fits the data, and then reporting estimation results for this threshold. To find K , we search over the entire support of pre-transfer income from the 2nd to 98th percentile in 0.1 percent increments, estimate the model using different values K , and then choose the K that minimizes the residual sum of squares.

After first estimating a model in which the dependent variable is net transfers (transfers in minus transfers out), we analyze transfers-in separately as a robustness check using Tobit specifications with an analogous approach to estimating the appropriate threshold parameter. We search over the support of pre-transfer income to choose a threshold parameter that best fits the data. As an analogue, we search for the K that yields the highest “pseudo-R-squared” from a standard statistical package.¹⁵

¹⁵Coefficient estimates from gross transfer in models using the Tobit should be interpreted as robustness checks and treated with care. There are two well-established reasons why coefficient estimates from the Tobit model are likely to be biased. First, the Tobit yields inconsistent parameter estimates when errors are heteroskedastic as one typically finds with survey data (Arabmazar and Schmidt, 1981). Second, parameter estimates will be inconsistent if the distribution of errors is not normal (Arabmazar and Schmidt, 1982) and cursory examination of the skewed distribution of transfers in Figure 2 suggests that this will certainly be the case.

Our second approach to estimating (3) is to use the partial linear model favored by Yatchew (2003). In this approach, observations in the sample are first ranked by I_i , and then differenced to obtain:

$$\Delta T_i^N = \Delta f(I_i) + \Delta \mathbf{X}_i' \gamma + \Delta \varepsilon_i \quad (5)$$

Since I_i is bounded as the sample size increases, $\Delta f(I_i) \approx 0$ as $f(I_i) - f(I_{i-1})$ approaches zero, so that (5) reduces to

$$\Delta T_i^N = \Delta \mathbf{X}_i' \gamma + \Delta \varepsilon_i \quad (6)$$

As long as I_i and other independent variables are not perfectly correlated, OLS estimation of (6) will provide consistent estimates of γ . In order to estimate the non-parametric relationship, $f(I_i)$, we use the estimated coefficients, $\hat{\gamma}$, to calculate

$$u_i = T_i^N - \mathbf{X}_i' \hat{\gamma} = f(I_i) + \varepsilon_i \quad (7)$$

Assuming that the ε_i are independent across households and identically distributed, u_i converges to $f(I_i)$ for large sample sizes. We use locally weighted regression (*lowess*) to estimate the non-parametric relationship between the response of transfers, $f(I_i)$, to pre-transfer income, I_i .¹⁶ We also calculate the income-varying transfer derivative of $f(I_i)$ as the slope of $f(I_i)$ in the neighborhood of $[I_i - 250, I_i + 250]$.

Covariates included among the \mathbf{X}_i when implementing (4) and (5) may provide additional insight into relative importance of factors other than pre-transfer income that influence transfers into households.¹⁷ For the elder resident of the household who is in our analysis sample, we include *years of schooling*, *age* and *age-squared* to control for human capital and life-cycle effects that will affect the wealth of the elderly resident and his or her spouse. A *Marital status* dummy and an indicator for a *male headed household* control for differences in preferences for co-residence that may arise if a spouse has passed away and resulting gender composition of the older generation. In order to control for health status of elderly residents, we combine the effects of 15 responses to activities

¹⁶Specifically, we use a bandwidth of 0.25 with observations weighted using a tri-cube weighting function as calculated by the *lowess* command in Stata. The lowess estimator was developed by Cleveland (1979) estimator, and has a benefit over some Kernel estimators in that it does not suffer from bias near the end points.

¹⁷We show summary statistics for covariates in Table 2.

of daily living questions (ADLs) using factor analysis and obtain the principle component.¹⁸ We then use the average principle component of elderly residents as a single control for health status. Though this index itself is dimensionless, it is increasing with improved health status.

We control for the size and quality of the transfer network with four variables: *number of living adult children*, *average education of adult children*, *average age of adult children*, and *number of living siblings*. We expect the value of net transfers to be increasing in number of adult children and average education of adult children. Average age of adult children is included to control for life-cycle effects of child age on transfer behavior, and number of siblings is included to control for any effects related to the larger family network. Finally, an indicator variable for *living with an adult child* and *household size* are additional controls that reflect endogenous living arrangement choices, and we discuss these variables and assess the nature of potential endogeneity bias in a separate section below.

Measures of Pre-Transfer Income

In our empirical estimation, we present results of models regressing net transfers on two different estimates of pre-transfer income: the first is reported income per capita of the household, and the second is a *full income* measure of household income per capita. We construct the full income measure out of concern that transfers received may be endogenous with the labor supply decisions of non-retired household members. Unobservables related to heterogeneity in the generosity of adult children living outside the household may introduce bias if parents (or siblings who co-reside with parents) respond by raising reservation wages in their job searches or fail to re-enter the labor force subsequent to job loss. In this case, the coefficient on pre-transfer income would be biased upward. Alternatively, if some low income households are not receiving transfers because adult children believe that a parent (or co-residing sibling) capable of working is not looking hard enough for employment, then the transfer derivative may be biased downward. Our approach to this problem is to use a *full income* measure of household income per capita calculated as the value of annual pension receipts and rental income, plus the *predicted full income* of working age

¹⁸Specifically, we use the stata command *factor*, and then save the principle component.

household members.¹⁹

For the full income approach to be useful for assessing the relationship between pre-transfer income and income earning ability, it is necessary that some dimension of full income is not correlated with household and family variables included in the \mathbf{X}_i of (4) and (5). To the extent that non-payment or shortfalls in pension receipts of retirees are beyond influence of the transfer network, this cause of low income will not be perfectly correlated with the independent variables. Although the probability of being a retiree from a firm suffering pension failure may be related to dimensions of worker ability that are correlated with ability of household and family members, we assume that our independent variables control for this common dimension of ability both in models using reported income (as in other studies) and in those using full-income measures.

The full income of working-age household members is predicted from a wage regression run on working age individuals employed in November 2001. The CULS contains a rich set of individual and family controls. In particular, variables such as prior experience as a dislocated worker (*xiagang*, registered unemployed or unemployed without access to benefits), serious physical deformities, and chronic illness proxy for past “shocks” that may have a long-term impact on productivity are included in the regression used to calculate full income.²⁰ Results from different candidate wage regressions are shown in supplementary appendix Table A.6. We use coefficients from model 5 to predict the hourly value of each working-age adults’ time, and assume a 40 hour work week and 50 weeks of employment during the year to calculate annual full income. Of course, experience of dislocation and even health shocks are not purely random and will be related to dimensions of ability that may be common within the family. To the extent that some portion of the scarring effect of these shocks will be uncorrelated with the \mathbf{X}_i in (4) and (5) and uncorrelated with non-labor determinants of remittances, the full income measure can be used to identify the responsiveness of transfers without bias introduced by endogenous labor supply decisions related to current earned

¹⁹A *full income* approach is favored by researchers in the empirical development literature as a way of reducing bias introduced if earned income is endogenous with current labor supply decisions (for a discussion, see Rosenzweig and Wolpin, 2000).

²⁰*Xiagang* is a special category of laid off workers from state and collective sectors that is nominally similar to the "laid off with possibility of recall" category found in North American and European labor force surveys, but in practice, the possibility of return to prior employer is very low.

income.²¹

While use of a full-income measure may solve a potential problem related to endogenous labor supply, one may be concerned that it provides a noisier measure of income than reported labor earnings, and thus an estimated transfer derivative may suffer from measurement error bias. It is worth remembering, however, that reported earnings may suffer from considerable error as well, because it is quite difficult to measure income accurately at low levels when short-term employment and in-kind payments are likely to be a larger fraction of income. In the CULS, as in the World Bank's Living Standards Measurement Surveys (LSMS), reported annual wage earnings are based on earnings from employment during the previous month multiplied by months employed during the prior year. The potential for measurement error bias is documented in research that compares poverty rates and estimates of inequality using a one-month reference period (as in the CULS and LSMS surveys) with those using diaries that record income earned over a calendar year (see Gibson et al, 2001 and Gibson et al, 2003). We show the distributions of reported pre-transfer income per capita and full income per capita in Figure 4. Note that under the full income measure, fewer elderly are living in households in which pre-transfer income per capita is below the poverty line.

Since there is no way to determine which measure of income suffers more from measurement error, we present results of transfer-responsiveness both to reported income and to full income. Where analyses using reported income raise concerns that the transfer derivative may be biased upward as a result of endogenous labor supply decisions or downward due to unobserved perceptions of members of the transfer network, the coefficient on full-income may be biased downward as a result of more serious measurement error. Comparing results of analyses using reported and full income in both parametric and semi-parametric implementations below suggests that while these sources of bias may exist, results are broadly consistent across choice of income measure.

Apart from endogeneity of labor income and remittances, another source of endogeneity may arise if an unobserved third factor affects both the ability of adult children to remit and the ability of household members to earn wage or pension income. The most obvious unobserved factor would operate through a common dimension of ability shared by both household members and members of the transfer network. By incorporating average age and educational attainment of the transfer

²¹Inclusion of age and age-squared in the wage regressions controls for life-cycle effects across cohorts of working age adults, and this will control for differences in productivity and ability to find employment across age cohorts.

network directly and by including the full income of working age residents, which is calculated using many indicators of productivity, we are comfortable that we reduce the potential for bias through unobservables related to ability and productivity.²²

The Role of Living Arrangements

In our main specifications we include household size and an indicator variable for whether an elderly resident (and/or spouse) lives with an adult child, and thus it is important to consider the extent to which the endogeneity of household composition may bias our results. The co-residence decision may itself reflect a net transfer to or from the adult child and his (or her) family that reflects either altruistic motives or intergenerational exchange. While we cannot “instrument” for the living arrangement decision, we can assess the nature and extent of bias that may be introduced by endogenous household composition.

We show characteristics of the adult children of retiree households in Table 3, separating those children living in the household from those living outside. Several differences in average characteristics suggest that co-residence often reflects a transfer from parent to adult child. First, fewer than half of adult children living with parents were married and only 42 percent were married with a child. Second, consistent with tradition of women marrying into their husbands’ homes, 31 percent of adults living with parents are female while 53 percent living outside the home are women.²³ Third, among children living apart from parents, a higher share have four-year college education, a higher share are employed, and fewer are still in school or too ill to work, all of which suggest that wealth and income earning ability may be important for the decision of an adult child to establish his (or her) own household.

We find no evidence that the decision to co-reside with an adult child is driven by low pension income. We run linear probability and probit models of co-residence on pension income received per retirement age retiree and other household and extended family characteristics, and show results

²²Of course, in the absence of an exogenous policy change or natural experiment, one could be concerned that some unobservable not previously considered may yet be introducing bias. One paper that adequately controls for this source of bias is Jensen (2003), who makes use of an exogenous increase in South African pensions to study whether an increase in pensions crowds out private transfers. We take some comfort from the fact that, in the South Africa context, Jensen finds that impact of increases in other household income on net transfers does not differ significantly from the impact of exogenous increases in pension receipts.

²³Note that a far higher share of adult children are living outside of the household, and so this does not suggest an unreasonable sex ratio of surviving children.

in Table 4. If co-residence is a response to low pension income, we should observe a negative sign on pension income per retiree. We do not observe a significant effect in models (1) and (2), which assume a linear relationship, or in models (4) and (5), which allow for nonlinearities using a piecewise linear spline with knots at the 25th, 50th and 75th percentiles of pension receipts per retiree. Note that we observe a statistically significant positive relationship between pension receipts and probability of co-residence at high levels of pension income, providing support for the possibility that co-residence reflects a transfer from elder parent to adult child. Marital status, which is coded as zero if a spouse is no longer alive, age, and number of children all have expected impact on likelihood of co-residence.²⁴ Co-residence becomes far more likely after a spouse has passed away, and probability of co-residence declines until age 74 and then starts to increase with age. Probability of co-residence first increases with average education of children, and then decreases after average education exceeds 12 years. We do not observe an impact of poor health on co-residence, but deterioration of physical functioning is strongly associated with age.

As the number of residents increases beyond elder parents and an adult child, *household size* controls for the effects of other co-residing family members on transfer behavior. Columns (3) and (6) of Table 4 show that, in common with the adult child co-residence decision, household size is only positively related to pension income per retiree for households in the upper quartile of the pension income distribution.

Based on responsiveness of living arrangements and household size to high pension income we feel more comfortable that living arrangement decisions do not reflect altruistic responses to low retirement income.²⁵ To be cautious, we also perform analyses below separately for elderly living with adult children and those living alone or with a spouse. We expect that those living with adult children may be able to count on transfers into the household at low levels of full income, but that transfers out may not be as great (or net transfers not as negative) at higher levels of income for

²⁴There is nothing special about breaking pension per retiree into four pieces, we also tried piecewise linear splines using quintiles and deciles and observe the same result.

²⁵Other research also offers comfort that potentially endogenous living arrangement choices may not introduce significant bias. In an analysis of private transfers into households in South Africa, Jensen (2003) finds that increases in co-residence are not systematically related to pension income. While Jensen does not separate households with low and high levels of pension income, the treated group (those receiving a discrete increase in pension income) is comprised of relatively low income households. Examining child labor supply and school enrollment outcomes using the same data source from South Africa, Edmonds (2005) does not find evidence that the potential endogeneity of living arrangements and pension receipt is a serious source of bias.

those elderly living with adult children if co-residence substitutes for a transfer from parents to children.

5 Results

In our results below we use multiples of the poverty line as reference points for examining transfer derivatives at different levels of pre-transfer reported and full income, and for comparing results using the threshold and partial linear models. The average annual poverty line for the five CULS cities was 2464 yuan RMB per capita in 2001. Each figure we present below shows vertical lines at half the poverty line, the poverty line, and two, four and eight times the poverty line. The 25th percentile values of pre-transfer reported and full income per capita were 4200 and 4368 yuan, respectively, and median values in the sample 6280 and 6600 yuan per capita, respectively.

The Transfer Derivative

To investigate the determinants of income transfers to the elderly, we first estimate the relationship specified in (3) using the conditional least square (CLS) threshold model, and present results in Table 5. As in Cox et al's study of net transfers into Philippine households, the coefficient on pre-transfer income at low levels of income is significant and negative, consistent with altruistic motives for net transfers at low levels of income. In column (1), reported income is used to calculate pre-transfer income, and the coefficient on pre-transfer income below the threshold is -0.68, while the coefficient on pre-transfer income using a full income measure is -0.52, as reported in column (2). The coefficient on reported income below the threshold may suggest more responsiveness to low income as a result of endogeneity bias, while the full income measure may be biased downward if we believe that measurement error bias is more serious for this income measure. In any case, both results suggest that net-transfers into households are responsive to low levels of pre-transfer income at low income levels, but households with elders are not fully insured. For each one yuan reduction in income at levels below the threshold, transfers increase by 0.52 to 0.68.²⁶

²⁶In columns (3) and (4) we present results using threshold Tobit estimates for gross transfers in as robustness checks. We treat these estimates as a robustness exercise for the possibility that transfers out do not respond flexibly to low pre-transfer income. Coefficients on these models suggest somewhat greater responsiveness of gross transfers

After the threshold, the strength of altruistic motives weakens considerably and the transfer derivative falls to -0.03 in the model using reported income, and -0.05 in the model using full income. While theory predicts a switch from altruistic to exchange motives as incomes increase, the threshold identified in the conditional least squares model suggests that altruistic motives cease to motivate transfers at very low levels of household income per capita. Estimates of the threshold range from 1200 to 1809 in models (1) and (2), respectively, and both values are well below the poverty line of 2464 yuan per capita. Given the bivariate relationships between transfers and pre-transfer income that we observe in Figures 2 and 3, a threshold between one half and two-thirds of the poverty line seems too low. In Figure 3, the plot of net-transfers against pre-transfer income for household who have elderly suggests a transition from dominance of altruistic to exchange motivated transfers at higher income levels that are much closer to the poverty line. In addition, well over 90 percent of the population under 65 reported that they would be willing to support elderly parents if they were in need (see supplementary appendix Table A.5). While we recognize the subjectivity and framing bias of this type of survey question, we do not believe that altruistic motivations for transfers are likely to cease to dominate the transfer decision at income levels well below the poverty line.

Estimating transfer derivatives with a partial-linear model allows for the possibility of a more gradual switch from dominance of altruistic to exchange motivations for transfers, and further, demonstrates a functional relationship between pre-transfer income and net transfers that is more consistent with the descriptive bivariate relationship. Results of the linear portion of the partial linear model are shown in Table 6 and the non-parametric functional relationship between pre-transfer income and net transfers is shown in Figure 5. We calculate average transfer derivatives in the neighborhood of six different multiples of the poverty line, and present these in Table 7.²⁷

Our results suggest that an altruistic motive is present at low levels of income, but there are two important differences from the CLS estimates. First, net-transfers are less responsive at low levels of pre-transfer income than suggested by the CLS estimates. Using reported pre-transfer income, at

to low pre-transfer income, yet before placing much emphasis on these models, it is important to be mindful of the unrealistic assumptions regarding the error term in the Tobit model.

²⁷In columns (5) and (6) we show the average transfer derivatives for a gross transfer-in model. The corresponding non-parametric relationship between gross transfers-in and pre-transfer income can be found in Figure A.2 of the supplementary appendix.

levels equal to half the poverty line (or slightly below the knot in the CLS model) a one yuan decline in income leads to 0.20 yuan increase in net transfers, and when full income measures are used we observe responsiveness rise to 0.26. While this provides evidence that transfers do respond to low levels of income and may assist with keeping the elderly out of poverty, our results do not suggest that private transfers are capable of fully insuring the elderly from low pension receipts. Second, we do not observe an abrupt threshold where one would argue that altruistic motives for transfers cease to be important or are no longer dominant. Instead we observe a smoother transition from altruistic to exchange motivated transfers, such that at the average poverty line (2464 yuan per capita) the transfer derivative is -0.16 for the full income models. Given that we expect children to respond altruistically when parents are genuinely in need, it makes sense that we observe somewhat stronger response to low income at the poverty line and even above it.

To consider the importance of co-residence with adult children on responsiveness of transfers at low and high income levels, we estimate the partial linear model separately for households in which the elder resident lives with an adult child, and for those in which he (or she) lives alone or with his (or her) spouse. The non-parametric relationship between pre-transfer full income is shown in Figure 6, and average estimates of the transfer derivative at different multiples of the poverty line are shown in columns (3) and (4) of Table 7.²⁸ The transfer derivatives suggest that at low levels of pre-transfer full income (below the poverty line), transfers are more responsive for elderly households with adult children than for those households in which the elderly reside alone or with a spouse. This likely arises because a low level of full income reflects not only the low pensions of elderly members, but also the low productivity of adult child co-residents who may have suffered chronic illness, disability, a prior lay-off, or some combination of these adverse states. In this situation, the income transfers from non-resident adult children reflect an altruistic response toward both parents and siblings.

High income per capita households with coresident adult children have net transfers that are much less responsive to changes in full income. The net transfer derivative for these households is nearly zero by the time full income is equal to twice the poverty line and changes little as income increases. This pattern of net transfers is consistent with co-residence functioning as a transfer from

²⁸Coefficients from the linear portion of the partial linear model are shown in Appendix Table A.7 and the non-parametric relationship for gross transfers in is shown in Figure A.5.

elder parent to adult child at higher levels of pension income. Negative net transfers (or positive transfers out) are not as responsive to changes in income at higher income levels because the transfer from altruistic parents is made to a child residing in the household. In the case of elderly living alone, by contrast, continued responsiveness of net transfers at higher levels of income is dominated by fact that transfers out of the household continue to increase with pension income. While the living arrangement may reflect implicit transfers, these results combined with our analyses of living arrangement responsiveness to pension income (in Table 4) provides comfort that endogeneity of living arrangements is not biasing our analysis at low levels of pre-transfer full income. At higher levels of income, evidence that (negative) net transfers are less responsive likely reflects the fact that individuals who would otherwise be recipients of transfers from retired parents are living in the household.

The Size and Quality of the Transfer Network

Apart from understanding responsive of transfers to different levels of pre-transfer income, other covariates in the linear portion of the model are of potential interest. China has gone through a rapid demographic transition accelerated by fertility controls known as the “One Child Policy” that reduce the potential size of transfer networks which may provide support to future generations of elderly. At the same time, the quality of education has improved markedly since the onset of reform in the late 1970s, and recent years have witnessed a rapid expansion in enrollments in higher education institutions. From Table 6, it is apparent that net transfers are positively associated with number of adult children (quantity) and with their average educational attainment (quality).

How will the One Child Policy, implemented in 1979, affect the ability of future elderly to receive support from their children? It is too early to evaluate whether the One Child Policy will lead to lower transfers to elderly, and moreover, it is quite possible that China’s economic growth combined with rising educational attainment and increases in returns to education will lead to a smaller transfer network of sufficient quality to compensate for reduced family size.²⁹ Moreover, differences in education quality and ability to save out of income earned over one’s lifetime varies

²⁹Someone who was 35 in 1979 was just 57 at the time the 2001 CULS was conducted, and since nearly all women in these early years were finished having children by this age, we are not yet able to observe the first “elderly” who were exposed to the “one child policy.”

considerably across cohorts.³⁰ Careful identification of the return to an additional child or returns to increases in the average educational attainment of children would require separation of elder parent and child cohort effects, and this is beyond what we can achieve with a single cross section.

Ignoring cohort-related unobservables and being careful not to ascribe any causal interpretation, we evaluate the extent to which coefficients on number of children and average education of children suggest that decline in family size is correlated with a sharp drop in transfers.³¹ In Table 8, we first calculate the median number of children for different cohorts of the elderly and adults over 50, and then for each cohort, we find the years of education at the 25th, 50th and 75th percentile of the distribution of years of education. We next predict the combined quantity and quality effects from coefficients found in Table 6, column 2, and show results in the final column of Table 8. Note that the drop in expected net transfers with a discrete change from four children to one child families would be roughly 170 yuan per capita and that when we consider the improved quality of the single child, this would suggest a lower but still significant reduction of roughly 100 yuan per capita. It is important to remember, however, that the appropriate counterfactual for understanding the impact of the One Child Policy on decline in expected transfers for the 50 to 55 age cohort should not be based on a comparison with the fertility of their parents' generation (the age 70 to 80 cohort), but on a comparison with their own likely fertility in the absence of a constraint. The average number of children born to families in urban areas had already fallen to two by the 60 to 70 age cohort, and thus for most urban couples under 55, constraints imposed by the One Child Policy reduced family size by only one child.³² For cohorts affected by the One Child Policy, the decrease in family size is only correlated with a modest decrease in predicted net transfers, in which the combined quantity

³⁰The content and quality of education differed considerably during the Cultural Revolution, and those cohorts who spent more of their working life prior to economic reform will have lower lifetime savings as they enter retirement.

³¹One might also worry about endogeneity of the fertility decision of current elderly (e.g., forward looking parents less worried about support may have had smaller families during fertile years), but it is doubtful that urban residents having children in the 1950s through 1970s could have foreseen a dramatic change in pension system in which they would have to live off of transfers from children or their own savings.

³²Each observation in a cohort represents a pair of parents when both husband and wife are still alive and living together, and the couple is assigned a cohort based on the age of the older member of the couple, most often the husband. We compare the predicted net transfers of the 50-55 cohort with the 60-70 cohort because we are fairly comfortable that the 60-70 cohort was not constrained by One Child Policy Fertility controls, and that the 50 to 55 cohort (and their younger spouses) represent the first cohort in which we can be sure that a significant share is constrained. The 55 to 60 cohort may also have enough couples constrained by the OCP (e.g., from men married to significantly younger women) that we may yet worry about comparing predicted transfers to this group with those from the 50 to 55 group.

and quality effect ranges from between 25 and 40 yuan per capita (see the last column of Table 8).

Despite the appeal of estimating the combined quantity-quality effect of policy induced decreases in family size on predicted net transfers, it is worth emphasizing again that using coefficients from the partial linear model to understand the potential effects of the One Child Policy requires making strong predictions out of sample. These predicted effects do not take into account the different life experiences and economic opportunities of future generations of elderly. As China's economy and incomes continue to grow, younger generations will earn higher salaries over their lifetimes, and have more time to save.

6 Conclusions and Policy Implications

In this paper, we address the question of how households with elderly cope when enterprise-based or local public pension systems fail to provide sufficient income. We find that private transfers to retirees are a widespread phenomenon in urban China, and that transfers are responsive to income levels when the recipient is poor. Although average per capita transfers-in to households only accounts for 4.4 per cent of the average per capita income of the elderly population, transfers to the poorer elderly are much higher. For those whose income level is at or below half the poverty line, every one yuan reduction of pre-transfer income increases the net per capita transfer by 20 to 26 cents, but by the time pre-transfer income approaches the poverty line, a one yuan reduction in income only leads to an increase in net transfers of 10 to 16 cents. While altruistically motivated transfers offer some insurance, they do not come close to covering the shortfalls that may arise with lack of pension income or severe pension arrears.

Second, existence of partial insurance suggests that improving the public pension system will not crowd out private transfers even at very low levels of income. Elder households experiencing shortfalls or non-payment of pensions must rely on savings or sale of liquid assets in addition to transfers if they are to maintain a standard of living above the poverty line. The lifetime savings of current elderly (the transitional generation) are often lower than their younger counterparts, however, because much of their working life occurred prior to reform when incomes were held artificially low and most "saving" was in the form of retained profits of state owned enterprises. Thus, there should be considerable concern about the well-being of transitional cohorts who receive

some support through transfers, but will have engaged in less private saving over their working lives than future generations of elderly.

Our findings have important policy implications. With regard to using the extended family as a substitute for the formal public pension scheme, we confirm that the extended family contributes in important ways to provision of support for the elderly. Policy may be used to further encourage familial support for elderly through use of tax concessions to children who support their parents through transfers or co-residence. In our sample, the amount transferred to parents is not large and hence may not be able to fully substitute for the public pension scheme, yet this support flows to elderly in need without any government encouragement. As an alternative to crowding out private transfers, it would be useful to design policy that encourages children to meet their filial obligations.

By encouraging transfers among extended families, policy could decrease inequality within families, but this will do nothing to limit growth of inequality across families. While more affluent families may transfer more resources to retired elderly under this policy, levels of intra-family income transfer will differ across families. If new policies are to be designed to encourage intra-family transfers, complementary policies should be developed to assist the less fortunate among the elderly who have few family members available to provide assistance, or those with less affluent children.

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Table 1
Per Capita Transfers and Income

	Transfer in		Transfer out	
	W/O Elderly	With Elderly	W/O Elderly	With Elderly
Average Transfers From and To Family Members	337	252	280	265
Average Net Transfer In	57	-18		
Average Pension Income Per Capita	663	4860		
Full Income Per Capita of Non-Retirees	6430	3103		
Pre-Transfer Full Income + Pension Income Per Capita (PTF Income)	7093	7964		
Average Transfer In/Out as a Percent of Average PTF Income	4.75	3.16	3.95	3.33
Percent of Households with None-Zero Transfer	37.5	37.3	43.8	39.1

Source: China Urban Labor Survey (2001).

Note: Summary statistics on per capita transfers and income are calculated using the full sample of 3499 households. Pre-transfer full income for individuals who have not retired is calculated using wage regression results shown in column (5) of Table A.6 in the supplementary appendix (www.msu.edu/~gilesj/cgm1append.pdf).

Table 2
Summary Statistics for the Analysis Sample

Variable	Mean	Standard Deviation
Pre-Transfer Income Per Capita	7580	5332
Pre-Transfer Full Income Per Capita	7379	4072
Pension Income Per Retiree	7524	5566
Live with Adult Child? (1=yes, 0=no)	0.489	0.500
Household Size	2.95	1.28
Married? (1=yes, 0=no)	0.667	0.471
Male Head? (1=yes, 0=no)	0.446	0.497
Years of Schooling	7.72	5.39
Age	70.02	7.32
Age Squared/100	49.57	10.57
Total Number of Children	2.89	1.51
Average Education of Children	11.34	3.32
(Average Education of Children Squared)/10	13.98	6.69
Average Age of Children	39.1	10.2
ADLs, HH Elderly Average Principle Component	-0.68	0.95
Shanghai	0.24	0.43
Wuhan	0.18	0.38
Shenyang	0.20	0.40
Fuzhou	0.16	0.37
Xian	0.23	0.42
Number of Observations	1344	

Notes: Summary statistics cover the 1344 households with elderly residents from the 2001 CULS.

Table 3
Characteristics of Adult Children of Households with Retirees
By Residence Location

	Living With Retirement Age Parent	Living Outside of Parent's Home
Number of Adult Children	750	3225
Share of Adult Children who are Female	0.31	0.53
Average Age	35.4	41.2
Share Who Are Married	0.49	0.93
Share Who Are Married w/Child	0.42	0.92
Average Years of Education	11.6	11.5
Share with Any Post-Secondary Education	0.25	0.23
Share with Four Year College Education	0.08	0.13
Share Employed	0.67	0.72
Share in School	0.03	0.01
Share Too Ill to Work	0.03	0.00
Average Number of Adult Children From Family	2.89	3.73

Source: 2001 China Urban Labor Survey (CULS). Information on adult children over age 16 from CULS households.

Table 4
Pension Receipts and the Probability of Living with Adult Children
(Robust Standard Errors in Parentheses)

Model	1	2	3	4	5	6
Dependent Variable	LP Live w/Adult Child?	Probit Live w/Adult Child?	OLS Household Size	LP Live w/Adult Child?	Probit Live w/Adult Child?	OLS Household Size
Pension Income Per Retiree (000s)	0.002 (0.003)	0.002 (0.003)	0.008 (0.007)	--- ---	--- ---	--- ---
Pension Income Per Retiree (000s) for Income >0 & Income <=4200	---	---	---	-0.006 (0.014)	-0.007 (0.016)	-0.008 (0.038)
Pension Income Per Retiree (000s) for Income >4200 & Income <=6624	---	---	---	-0.017 (0.023)	-0.014 (0.026)	0.021 (0.061)
Pension Income Per Retiree (000s) for Income >6624 & Income < 9918	---	---	---	-0.006 (0.016)	-0.018 (0.019)	-0.037 (0.041)
Pension Income Per Retiree (000s) for Income >9918	---	---	---	0.008 (0.004)	0.018 (0.008)	0.019 (0.010)
Married? (Yes=1, No=0)	-0.248 (0.033)	-0.265 (0.034)	0.336 (0.087)	-0.241 (0.033)	-0.258 (0.035)	0.346 (0.087)
Male Headed Household	0.011 (0.030)	0.009 (0.033)	-0.074 (0.079)	0.018 (0.030)	0.019 (0.033)	-0.064 (0.079)
Age	-0.115 (0.029)	-0.143 (0.035)	-0.203 (0.076)	-0.111 (0.029)	-0.138 (0.035)	-0.197 (0.076)
Age Squared/100	0.080 (0.020)	0.100 (0.024)	0.155 (0.052)	0.078 (0.020)	0.097 (0.024)	0.151 (0.052)
Years of Schooling	-0.011 (0.003)	-0.013 (0.004)	-0.033 (0.008)	-0.009 (0.003)	-0.011 (0.004)	-0.030 (0.008)
Number of Children	0.014 (0.010)	0.016 (0.011)	0.061 (0.026)	0.012 (0.010)	0.014 (0.011)	0.059 (0.027)
Average Years of Children's Schooling	0.114 (0.016)	0.137 (0.019)	0.208 (0.043)	0.114 (0.016)	0.138 (0.020)	0.206 (0.043)
(Average Years of Children's Schooling Squared) /10	-0.047 (0.008)	-0.056 (0.009)	-0.095 (0.020)	-0.046 (0.008)	-0.055 (0.009)	-0.093 (0.020)
Average Age of Children	-0.008 (0.002)	-0.009 (0.002)	-0.020 (0.005)	-0.008 (0.002)	-0.009 (0.002)	-0.020 (0.005)
Number of Siblings	0.009 (0.011)	0.010 (0.012)	0.013 (0.029)	0.010 (0.011)	0.012 (0.012)	0.015 (0.029)
ADLs, HH Elderly Average Principle Component	0.005 (0.016)	0.008 (0.018)	0.071 (0.041)	0.007 (0.016)	0.011 (0.018)	0.071 (0.042)
R-Sqr or Pseudo R-Sqr	0.141	0.111	0.083	0.144	0.115	0.085
Obs	1327	1327	1327	1327	1327	1327

Note: All models include statistically significant city fixed effects.

Table 5
Determinants of Transfers to Households with Retirement Age Residents:
Threshold Model Estimates
(Robust Standard Errors In Parentheses)

Dependent Variable	Net Transfers In		Gross Transfers In	
	Reported Income Per Capita CLS (1)	Full Income Per Capita CLS (2)	Reported Income Per Capita T-Tobit (3)	Full Income Per Capita T-Tobit (4)
Pre-Transfer Income Below Threshold	-0.68 (0.34)	-0.52 (0.23)	-0.94 (0.37)	-0.61 (0.17)
Pre-Transfer Income Above Threshold	-0.03 (0.01)	-0.05 (0.01)	-0.06 (0.02)	-0.08 (0.02)
Estimated Threshold	1200 (161)	1809 (189)	1192 (160)	2412 (104)
Years of Schooling	12.41 (7.90)	16.87 (8.19)	35.19 (14.10)	38.72 (14.22)
Married	-108.00 (77.00)	-141.00 (75.00)	-184.00 (159.00)	-248.00 (158.00)
Live w/Adult Child	-45.37 (67.53)	-1.43 67.85	-366.00 (172.00)	-301.00 (173.00)
Household Size	12.51 (22.86)	7.08 (22.96)	-108.00 (68.00)	-103.00 (68.00)
Male Headed Household	-45.44 (53.56)	-42.84 (53.56)	-137.00 (137.00)	-126.00 (136.00)
Age	-72.30 (61.56)	-46.67 (58.11)	-123.00 (129.00)	-79.44 (128.16)
Age-Squared	52.35 (43.14)	37.32 (41.01)	89.65 (87.80)	62.54 (87.44)
Total Number of Children	49.40 (32.23)	48.43 (31.94)	210.00 (45.00)	207.00 (44.00)
Average Education of Children	7.90 (10.36)	14.13 (10.15)	9.06 (21.84)	18.38 (22.04)
Average Age of Children	-1.09 (3.63)	-1.82 (3.56)	-3.05 (7.88)	-4.07 (7.84)
Total Number of Siblings	-4.94 (16.65)	0.69 (16.41)	-53.48 (51.59)	-45.37 (51.35)
ADLs, HH Elderly Average Principle Component	-112.36 (49.40)	-114.81 (48.88)	-163.50 (92.84)	-170.19 (92.00)
N	1340	1340	1344	1344
r ²	0.078	0.091	0.011	0.011

Note: All models include statistically significant city fixed effects.

Table 6
Determinants of Transfers to Retirement Age Adults
Coefficients on Linear Portion of Partial Linear Model
(Robust Standard Errors In Parentheses)

Dependent Variable Pre-Transfer Income Measure	Net Transfers In		Gross Transfers In	
	Reported Income Per Capita (1)	Full Income Per Capita (2)	Reported Income Per Capita (3)	Full Income Per Capita (4)
Years of Schooling	11.09 (8.07)	18.18 (8.65)	6.88 (3.98)	21.55 (7.84)
Married	-166.39 (68.29)	-251.74 (70.64)	-104.53 (50.26)	-243.31 (58.20)
Live w/Adult Child	-100.98 (76.21)	0.3381 70.7137	-76.03 (46.30)	-131.92 (61.50)
Household Size	12.08 (28.52)	4.84 (22.22)	-16.09 (23.35)	-46.27 (18.42)
Male Headed Household	21.87 (61.10)	-24.44 (65.10)	20.27 (44.79)	19.19 (59.24)
Age	-107.11 (67.18)	11.19 (55.62)	2.09 (58.28)	-32.65 (53.43)
Age-Squared	71.95 (46.41)	-3.60 (38.90)	1.50 (40.03)	29.31 (37.51)
Total Number of Children	48.98 (29.07)	56.44 (24.39)	42.53 (22.76)	72.13 (23.07)
Average Education of Children	16.57 (10.72)	18.28 (10.16)	16.92 (7.01)	23.87 (8.60)
Average Age of Children	-1.06 (3.31)	-4.06 (3.13)	-6.03 (4.03)	-6.98 (4.28)
Total Number of Siblings	-3.75 (20.23)	12.52 (20.03)	4.33 (11.00)	9.76 (16.59)
Activities of Daily Living, Principle Component	-96.82 (50.62)	-170.11 (48.01)	-17.16 (33.28)	-87.50 (41.57)
N	1331	1330	1339	1338
r ²	0.0261	0.055	0.038	0.0883

Note: All models include statistically significant city fixed effects.

Table 7
Estimated Transfer Derivatives in the Neighborhood of Different Multiples of the Poverty Line

Multiple	Income/Capita Range	Net Transfer as a Function of...		Net Transfer as a Function of <i>Full</i> <i>Income</i> for Elderly who...		Gross Transfer In as a Function of...	
		Reported Income	Full Income	Live with Adult Child(ren)	Live Alone or with Spouse	Reported Income	Full Income
Half Poverty Line	982 to 1482	-0.197	-0.256	-0.357	-0.206	-0.236	-0.236
Poverty Line	2214 to 2714	-0.103	-0.164	-0.234	-0.129	-0.114	-0.156
2*Poverty Line	4678 to 5178	-0.061	-0.078	-0.055	-0.095	-0.020	-0.053
3*Poverty Line	7141 to 7641	-0.052	-0.065	-0.011	-0.097	-0.016	-0.034
4*Poverty Line	9605 to 10105	-0.046	-0.053	-0.012	-0.079	-0.013	-0.025
8*Poverty Line	19460 to 19960	-0.004	-0.018	-0.017	-0.010	-0.005	-0.007

Note: The poverty line is based on the minimum living standard consumption per capita line calculated by the Ministry of Labor and Social Security for each city. The average annual poverty line across the five CULS cities is 2464 RMB Yuan/Capita.

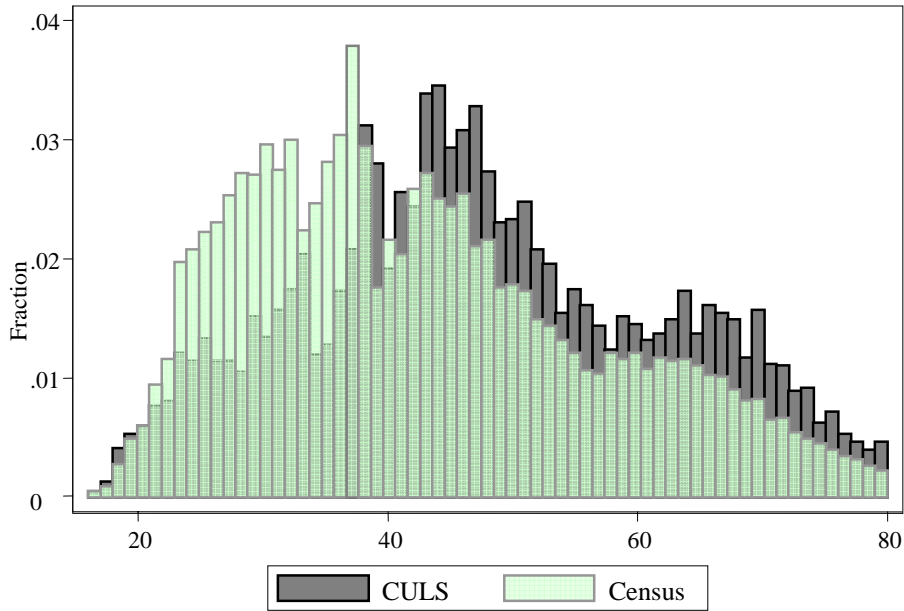
Table 8
What is the Impact of Quantity and Quality of Children on Predicted Net Transfers?

Parent Age Category	Median Number of Children	"Quantity" Effect	Median Years of Child Education	"Quality" Effect	"Quantity" and "Quality" Effects
<i>Child Ed Attainment: 25th Percentile</i>					
Over 80	4	226	8	146	372
>= 70 & <80	3	169	9	165	334
>=60 & <70	2	113	10	183	296
>=55 & <60	2	113	11	201	314
>=50 & <55	1	56	12	219	276
<i>Child Ed Attainment: 50th Percentile</i>					
Over 80	4	226	10	183	408
>= 70 & <80	3	169	11	201	370
>=60 & <70	2	113	12	219	332
>=55 & <60	2	113	12	219	332
>=50 & <55	1	56	13	238	294
<i>Child Ed Attainment: 75th Percentile</i>					
Over 80	4	226	12	219	445
>= 70 & <80	3	169	12	219	389
>=60 & <70	2	113	14	256	369
>=55 & <60	2	113	15	274	387
>=50 & <55	1	56	15	274	331

*Notes: Quantity and quality effects are predicted from model 2 of Table 8. The effects on 50 to 55 and 55 to 60 cohorts are predicted out of sample as if same coefficients will apply to these age cohorts.

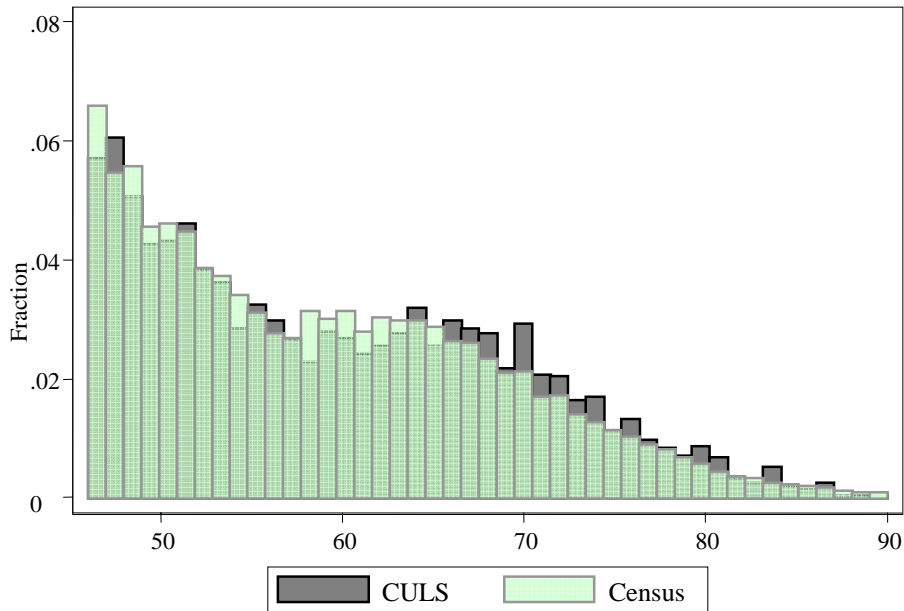
Figure 1
Comparison of Age Distributions in the Sample and 2000 Population Census

A. Urban Population Over 16 and Not Currently Enrolled in School



Note: Mean age in the Census is 43 and mean age in the CULS is 48.

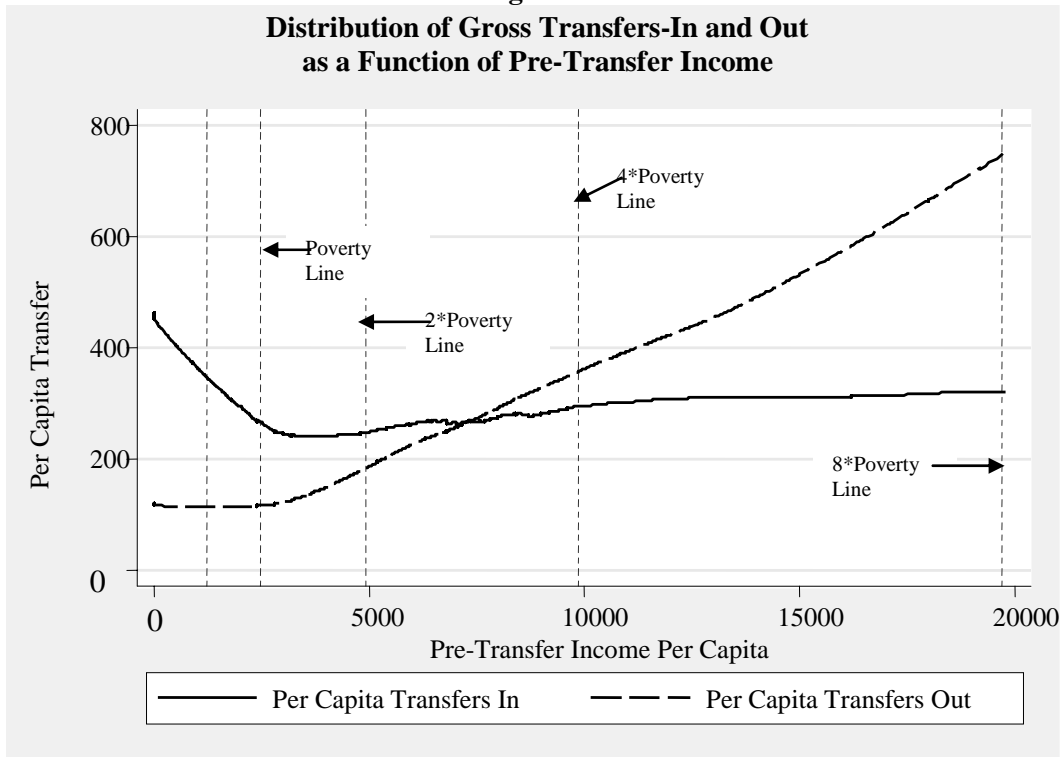
B. Urban Population Over 45 Years of Age



Note: Mean age in the Census is 58 and mean age in the CULS is 59.

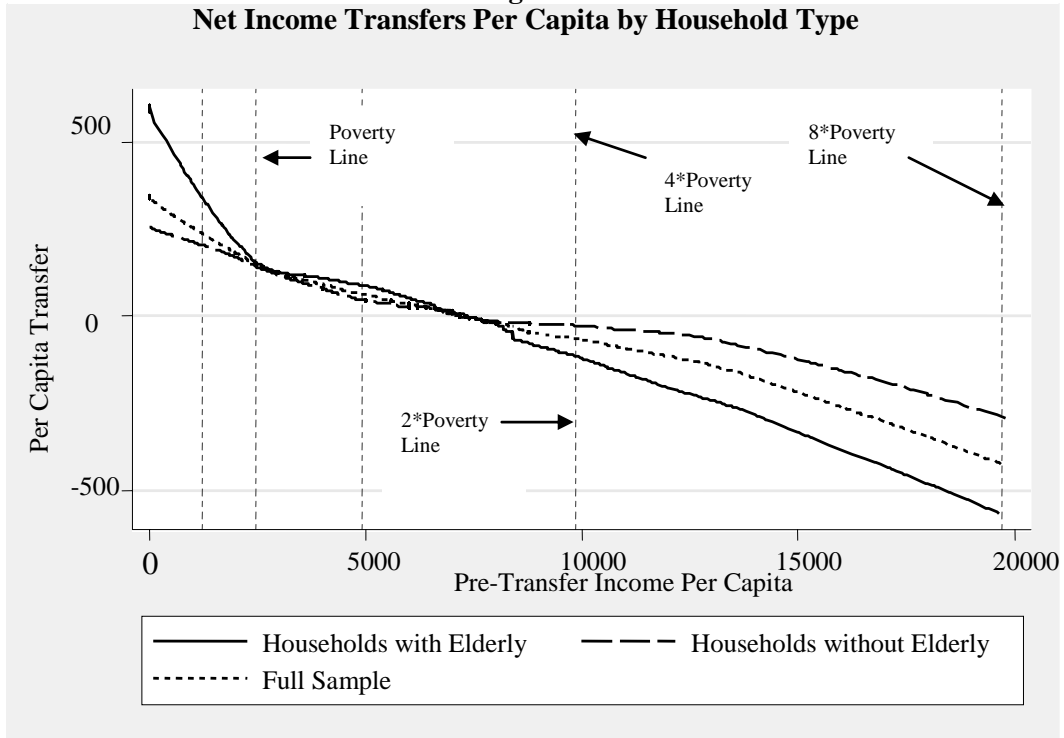
Sources: China Population Census, 0.1 Percent Sample and China Urban Labor Survey (2001).

Figure 2
Distribution of Gross Transfers-In and Out
as a Function of Pre-Transfer Income



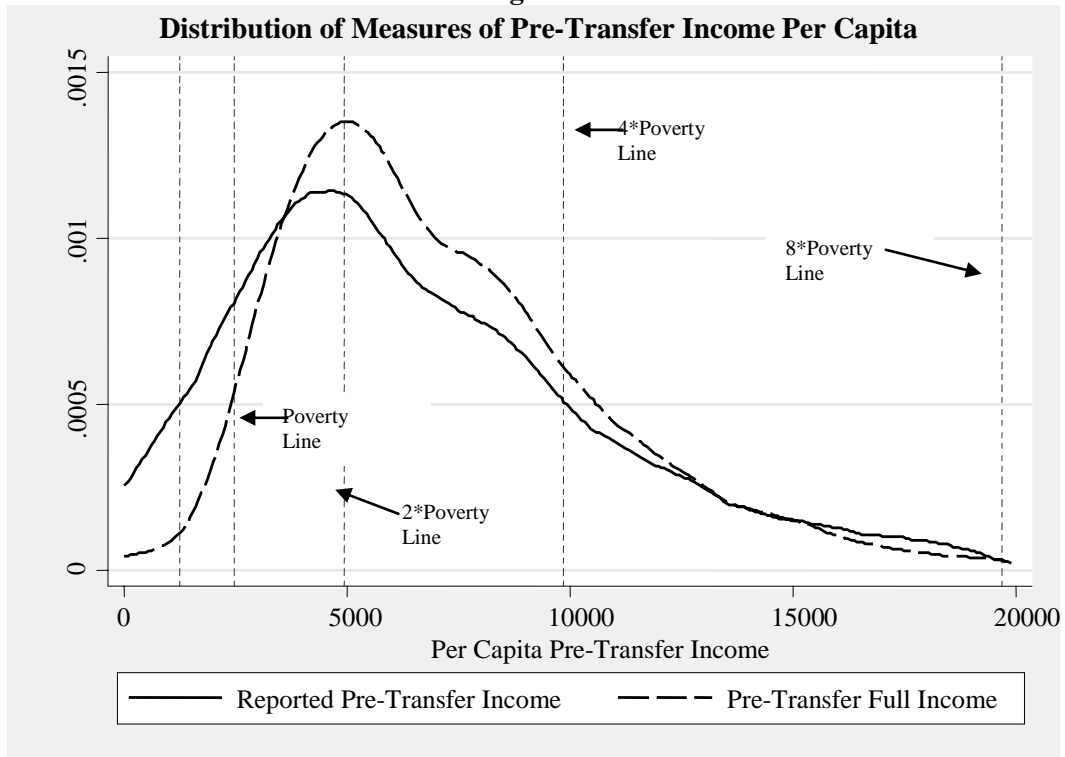
Source: China Urban Labor Survey (2001). The poverty line is based on the minimum living standard consumption per capita line calculated by the Ministry of Labor and Social Security for each city. The average annual poverty line across the five CULS cities is 2464 RMB Yuan/Capita.

Figure 3
Net Income Transfers Per Capita by Household Type



Source: China Urban Labor Survey (2001). The poverty line is based on the minimum living standard consumption per capita line calculated by the Ministry of Labor and Social Security for each city. The average annual poverty line across the five CULS cities is 2464 RMB Yuan/Capita.

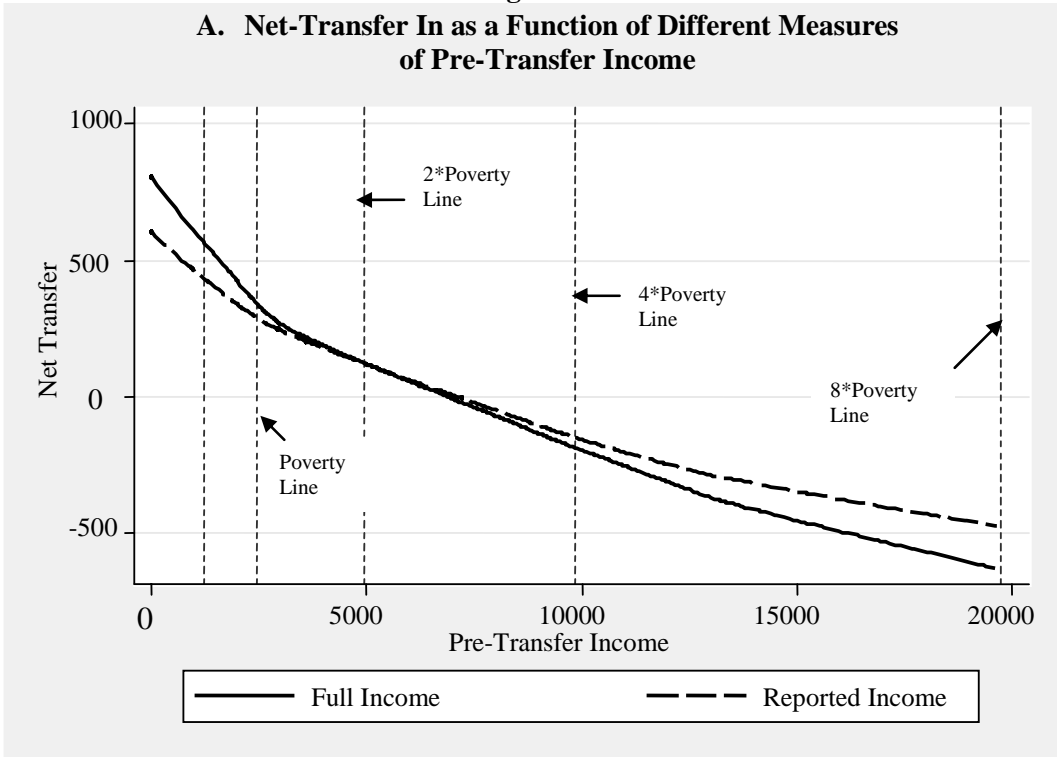
Figure 4



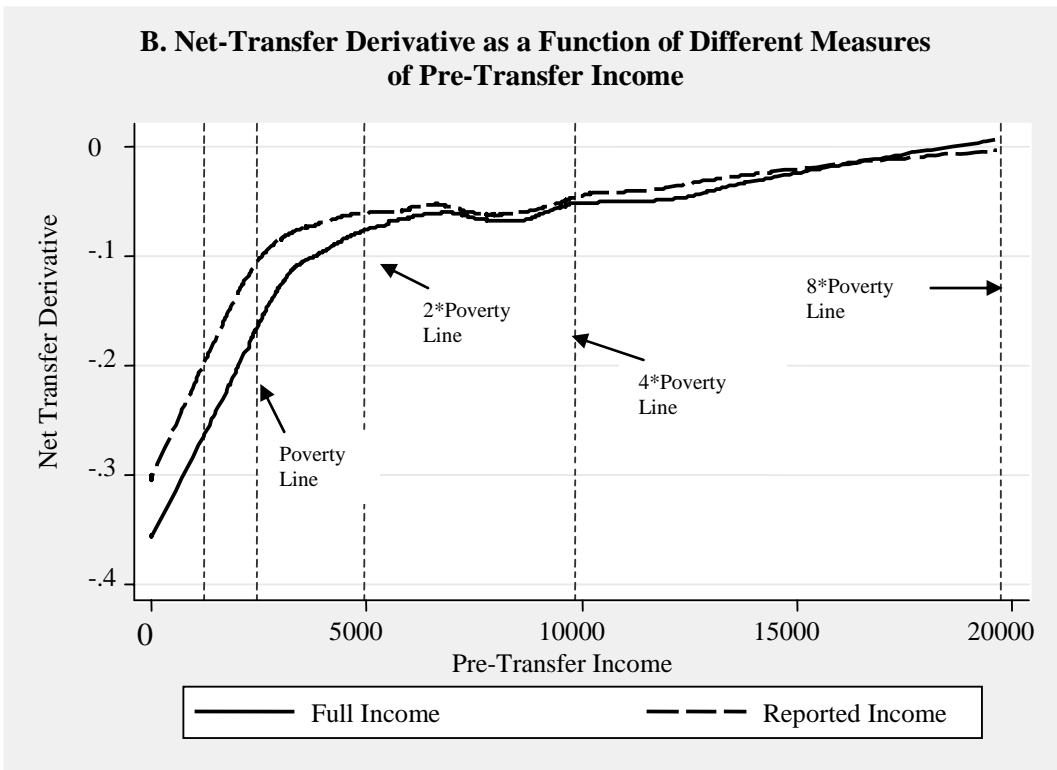
Source: China Urban Labor Survey (2001). The poverty line is based on the minimum living standard consumption per capita line calculated by the Ministry of Labor and Social Security for each city. The average annual poverty line across the five CULS cities is 2464 RMB Yuan/Capita.

Figure 5

A. Net-Transfer In as a Function of Different Measures of Pre-Transfer Income

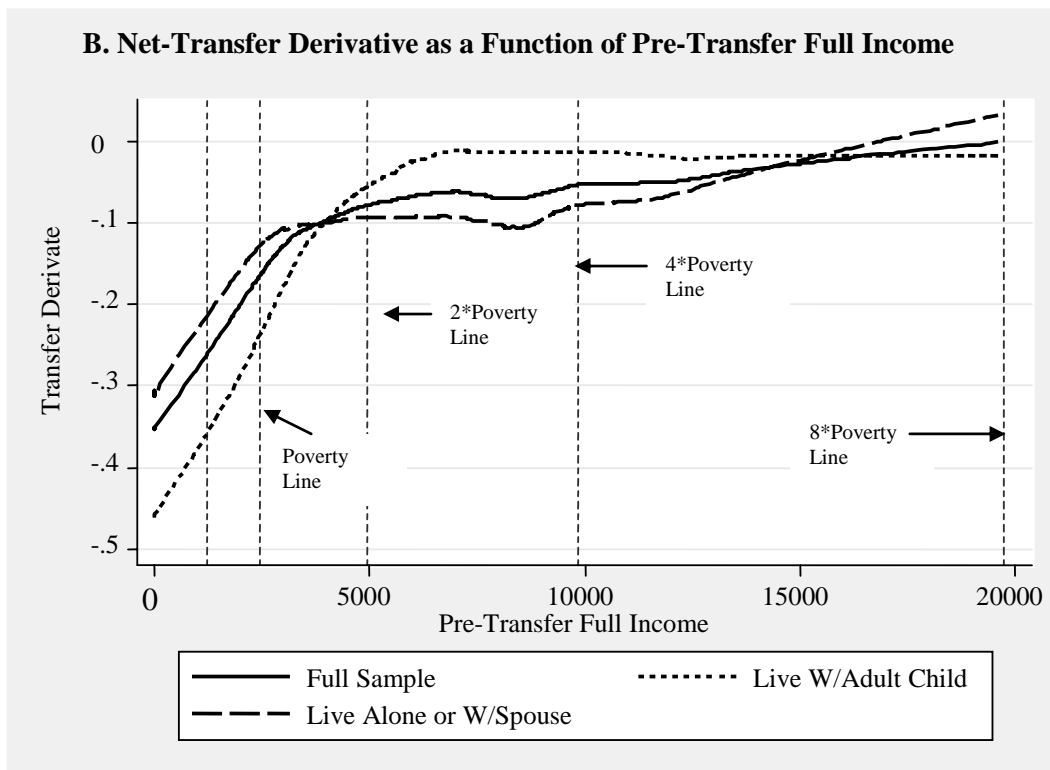
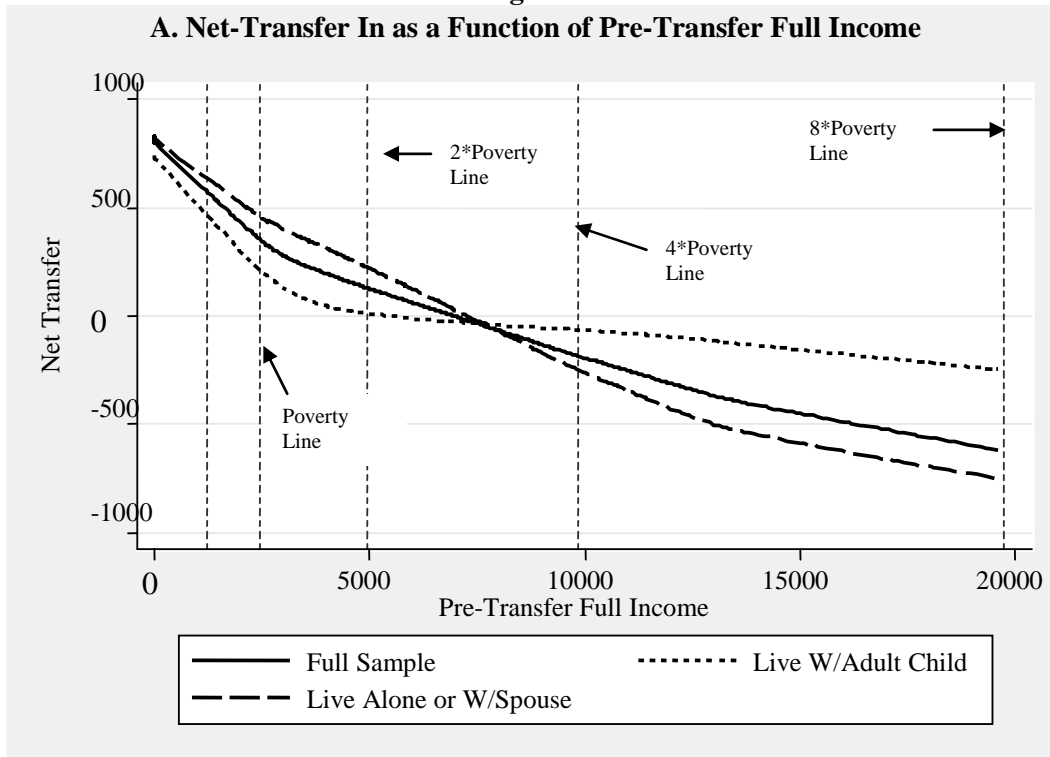


B. Net-Transfer Derivative as a Function of Different Measures of Pre-Transfer Income



The poverty line is based on the minimum living standard consumption per capita line calculated by the Ministry of Labor and Social Security for each city. The average annual poverty line across the five CULS cities is 2464 RMB Yuan/Capita.

Figure 6



The poverty line is based on the minimum living standard consumption per capita line calculated by the Ministry of Labor and Social Security for each city. The average annual poverty line across the five CULS cities is 2464 RMB Yuan/Capita.