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Can China's Rural Elderly Count on Support from Adult Children?

Implications of Rural-to-Urban Migration

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Abstract

This paper shows that support from the family continues to be an important source of support for the rural elderly, particularly the rural elderly over 70 years of age. Decline in likelihood of co-residence with, or in close proximity to, adult children raises the possibility that China's rural elderly will receive less support in the forms of both income and in-kind instrumental care. Although descriptive evidence on net financial transfers suggests that the elderly with migrant children will receive similar

levels of financial transfers as those without migrant children, the predicted variance associated with these transfers implies a higher risk that elderly with migrant children may fall into poverty. Reducing the risk of low incomes among the elderly is one important motive for new rural pension initiatives supported by China's government, which are scheduled to be expanded to cover all rural counties by the end of the 12th Five Year Plan in 2016.

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Can China's Rural Elderly Count on Support from Adult Children?

Implications of Rural-to-Urban Migration[♦]

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1. Introduction

China's economy has undergone unprecedented growth over the last twenty-five years, and this has facilitated a dramatic reduction in poverty. While average incomes have risen considerably, it is also well documented that not all regions of the country have benefited uniformly (Ravallion and Chen, 2007; Benjamin et al, 2008). Gaps exist between coastal and interior regions and between urban and rural areas of the country (Kanbur and Zhang, 1999; 2005). In addition to differences in income and consumption growth by geography (Jalan and Ravallion, 2002), there are also considerable differences across demographic groups not only in income levels (Chaudhuri and Datt, 2009), but also in the level of coverage by safety nets and in the risks of falling into poverty (Duclos et al, 2010; Jalan and Ravallion, 1999). In particular, the movement of young rural adults to urban and coastal areas for higher income earning opportunities raises the prospect that older residents remaining in rural areas are at greater risk of falling into poverty. In general, rural residents lack access to pension support when they are of "retirement age," and must rely on either their own labor income or support from family members, even as they age into their 70s and beyond. In rural China, financial support for the elderly remains the responsibility of adult children and is even codified into laws governing the family (Marriage Law, 2001). As the population of potential care providers continues to shrink as a result of both China's demographic transition and the availability of attractive migrant employment opportunities for the young, many observers have expressed concerns for the well-being of the rural elderly (Benjamin et al, 2000; Jiang and Zhao, 2009; Li et al, 2009; Yao, 2006).

In this paper, we use the 2005 one percent population sample to document the sources of support for older rural residents, and then present updated evidence on the rates both at which the

rural elderly co-reside with adult children and live in proximity to them. We next provide descriptive evidence on the extent to which private net transfers from adult children respond to low income levels of their elderly parents. To do this, we first introduce a framework for examining how net-transfers respond to elderly income, and then make use of a unique data source with information on the age and residence location of all non-resident children of the household. These features of the data source allow us to reduce one form of bias common in many studies of intergenerational transfers: we control for the size and quality of the transfer network. Given specific concerns over abandonment by adult children we examine whether transfer responsiveness differs when an elderly person has migrant children, and moreover, whether the variance of expected transfers varies between elderly with migrant children and those who only have children living nearby.

The descriptive evidence presented shows somewhat higher variance in the predicted transfers to the elderly who have migrant children, and this is consistent with concerns that the current and future elderly may face more uncertainty in their support from adult children.¹ Given that migrants employed in non-agricultural work are frequently in the informal sector, they often have more risky incomes, and so it is not surprising that this risk is reflected in transfers to their parents.² One potential policy response to increasing risk to private transfer income is the introduction of a rural pension capable of reducing vulnerability to poverty in old age. China's government is currently supporting new rural pension programs which are designed to reduce these perceived risks of elderly poverty and to complement existing motives for private transfers.

¹For reasons that we will describe in detail in the paper, this should not be interpreted as a causal effect of migration per se, but as a purely descriptive outcome after all welfare maximizing joint migration and transfer decisions have been made.

²The vast majority of rural migrants have risky income themselves: they often lack employment contracts, may have seasonal employment of short duration, and lack the workplace protections of formal sector workers.

When considering the viability of a publicly supported transfer mechanism, such as a base level non-contributory pension, concerns frequently arise over whether public transfers may crowd out private transfers, and as a result offer a lower than intended cushion against falling into poverty. The paper assesses the importance of this concern by examining the responsiveness of private transfers to low income in households with elderly residents. The analysis suggests that a noncontributory pension might partially crowd out private transfers, even at very low levels of income per capita, but that it would still nonetheless raise the living standards of elderly who might otherwise find themselves in poverty. To some extent, support for younger members of the current elderly under the new rural pension responds to this concern.

The paper proceeds as follows. Section 2 presents descriptive statistics from the 2005 one percent population sample on sources of support for China's elderly, with particular attention to contrasts between elderly living in rural and urban areas. It next presents updated evidence on changes in living arrangements which lie behind concerns that the rural elderly are at increasing risk of falling into poverty. Finally, the section concludes with a review of trends in rural-to-urban migration in China and reviews debates over whether migration may be leading to problems of elderly abandonment. Section 3 introduces a conceptual framework for analyzing the responsiveness of transfers to the income levels of the elderly, and then introduces the data source to be used in the analysis. Results of the analytical exercises are presented in Section 4 and a final section discusses results in light of new rural pension experiments that are due to be expanded nationally by the end of the 12th Five Year Plan in 2016.

2. Elderly Support, Living Arrangements and Migration

Sources of Support for China's Elderly Population

One reason that developing a safety net or pension system targeted to the rural elderly has received relatively little attention is that it has long been assumed that the rural elderly would be supported through traditional, family-based arrangements. In the past, lack of attention to the rural elderly has been rationalized on two grounds. First, family values remain strong in rural areas, and Confucian “filial piety” continues to sustain a tradition of family-based care for the elderly. While it may erode over time, there is already a well-functioning, deeply rooted informal old-age security system in rural areas. Second, any formal public policy response to the needs of the rural elderly may undermine those existing private arrangements. For example, state transfers to the elderly may crowd out existing transfers from younger family members. One line of argument, frequently heard in the past, is that it may be better to leave well enough alone in rural areas and focus on reform of the urban pension system.

Many observers have recently questioned the view that family support for the rural elderly will be sufficient. Fertility decline driven by China's population policies may ultimately lead to breakdown of the traditional support system, but conclusions from research spanning literatures in demography and economics disagree on the likeliness of this outcome. Zimmer and Kwong (2003) show that more children increase the likelihood that elderly will receive support, but present simulation results suggesting that declines in fertility alone will not lead to collapse of family-based support for the elderly. Other research has suggested that financial transfers to parents respond to low income and low health status in urban areas (Cai et al, 2006), but that in

rural areas important inter-household transfers may not be observed because they take the form of labor input into family farming (Lee and Xiao, 1998).³

Evidence from the 2005 one percent population sample, which is highlighted in Table 1, shows the sharp differences between rural and urban elderly in their sources of financial support. Where a substantial share of the urban population relies on pension income, fewer than five percent of rural residents over 60 reported that pensions are their most important source of financial support. Indeed, the rural elderly rely significantly more on support from family members, 54 percent, and also quite striking, 38 percent of the rural population over 60 relies primarily on their own labor income for support.

When we examine sources of support by gender in Table 1, we note that family support is relatively more important for women over 60, who tend to live longer, and labor income remains more important for men. Of women over 60, 69 percent report financial support from family members as their most important source of support and only 28 percent report that labor income is most important. By contrast, 49 percent of men over 60 report that their own labor income remains their most important source of support, and only 39 percent report support from family members. When distinguishing the importance of pension by gender in rural areas, a significantly higher share of men (8.1 percent) than women (1.3 percent) report pension income to be their most significant source of financial support. While the gap between men and women would appear to be significant, it reflects historical differences between genders in employment in local government and the military, both of which may provide some pension support.

Neither the nationally representative statistics that we calculate from the 2005 one percent population sample, nor the World Bank Poverty Assessment (Chaudhuri and Datt, 2009)

³Using other methods, Cameron and Cobb-Clark (2008) do not find evidence that transfers to parents respond to low parent income in Indonesia.

show much evidence that assistance through a minimum living standard guarantee program (the *dibao*) is an important source of income support for rural households, including the elderly.⁴ Part of the reason for this may stem from the fact that the rural *dibao* was still being phased in at the time of 2005 population sub-sample survey and even when work was being completed for the World Bank Poverty Assessment. Funds available through the rural *dibao* program are not substantial, and are not likely to be more significant than family support for those rural elderly who are unable to work but still have living adult children.

Also notable in Table 1 is the inability of the elderly to earn income from property. In contrast to the United States or Europe historically, or other developing countries at present, the elderly in China have not grown old in an environment in which they could accumulate land wealth. One legacy of collective ownership of land under China's land tenure system, the lack of land wealth, limits the ability of the elderly to earn income from rental and may also limit their scope for encouraging inter-generational transfers from their children (who would be prospective heirs).

A look at the sources of income by age cohort among the elderly emphasizes differences in financial support between the young and old elderly. Elderly who are in their early 60s are far more likely to support themselves primarily from labor income, while elderly over age 70 depend far more on financial support from family members. It is notable that nearly a quarter of the elderly between age 70 and 75 continue to report labor income as their main source of support. Apart from the family support and labor income, no other source of support varies significantly by age cohort of the elderly. Moreover, no other component plays a particularly significant role.

⁴The *dibao* is a minimum living standards guarantee program that provides subsidies to households living below a locally determined minimum income threshold. Households are identified for support through community-based targeting.

Living Arrangements and the Well-Being of the Elderly

In terms of understanding the well-being of the elderly in developing countries, much prior research has relied on indirect evidence suggested either by patterns of living arrangements or by labor supply and retirement decisions. This focus derives from the fact that large sample surveys typically lack direct measures related to the provision of support within the household, including financial support, in-kind transfers and instrumental care. Living arrangements, or co-residence, are thus used as a proxy for elderly access to these frequently unobserved sources of support.

Observed declines in co-residence with adult children have been cited most frequently as reasons for concern that China's rural elderly are losing support from their adult children. Benjamin et al (2000) note that in rural north China over 85 percent of the elderly lived in extended households in 1935, but that this figure had dropped to just over 60 percent by 1995.⁵ The decline in co-residence with adult children is strikingly evident over the six rounds, from 1991 to 2006, of the China Health and Nutrition Survey (CHNS). Figure 1 shows that in the CHNS, nearly 70 percent of adults over 60 in rural areas lived with an adult child in 1991, but by 2006 this share had fallen to just over 40 percent.

The change in living arrangements over both the long-term (from the 1930s to the 1990s as noted in Benjamin et al (2000)) and the short-run (from 1991 to 2006 in the CHNS) does not necessarily reflect a drop in the provision of care to the elderly. In-kind transfers, such as supply of labor on extended family plots and provision of care, are difficult to pick up in surveys, yet such transfers often occur both within and across households. Changes in living arrangements may reflect, in part, the increasing wealth of families. With increasing resources, co-residence may not be necessary to care for the elderly. Within villages in rural areas, elders and adult

⁵Selden (1993) concludes that a transition to the nuclear family imposes a heavy price on the rural elderly. Living arrangements are thought to be important for elderly support across East Asia, including Cambodia (Zimmer and Kim, 2002), Thailand (Knodel and Chayovan, 1997), and Viet Nam (Anh et al, 1997).

children are typically in the same village small group (a sub-village administrative unit) and live in close proximity with one another. Given increases in housing wealth accumulated in rural areas since the mid-1980s, the trend toward nuclear families may well signal a wealth effect independent of the traditional value of providing support and care to elder parents.

A more important concern may be the proximity of adult children, and not whether they co-reside. In Figure 2 we summarize the living arrangements by age cohort from a supplemental survey conducted in 2004 with the Research Center for the Rural Economy (RCRE) at China's Ministry of Agriculture (and which is discussed below), and includes information on children living within the same village as their elders. While co-residence with adult children was common for fewer than 60 percent of respondents among those aged 60 to 70, more than half the elderly living alone or with a spouse in this age range had at least one adult child living in the village.⁶ This suggests that while co-residence was well below levels of the 1930s, adult children were still potentially available to provide both instrumental care and financial support. As elder parent age increases, the probability of co-residence with an adult child approaches 100 percent.⁷

Decline in co-residence reflects a decline in support for the elderly only if it is associated with increased elderly abandonment. The rural elderly may have sufficient support if they are receiving transfers from local or migrant adult children. Moreover, the adult children of rural elderly who have become infirm may yet respond to traditional values and return to care for their parents. Giles and Mu (2007) explore this possibility conducting separate analyses using two different data sources (the CHNS and the RCRE surveys), and find a significantly lower

⁶Note that co-residence in rural areas of the four RCRE provinces was also somewhat higher than what we observe for rural areas of the CHNS panel.

⁷Of course, two very different conclusions are consistent with evidence of greater incidence of co-residence with age in a simple cross-section: the oldest, who are more likely to be infirm, tend to move in with adult children; alternatively, if co-residence does have an impact on the quality of care provided, then perhaps only the elderly living with adult children reach old age.

probability that a son will work as a migrant when a parent is seriously ill. While parental illness has a statistically significant negative effect on the probability of migration, it does not completely drive the decision to remain employed in migrant destinations. Depending on dataset and methodology, Giles and Mu showed that chronic illness and infirmity led to a 15 to 26 percent reduction in the probability that a son would be employed as a migrant, and this effect was reduced if other siblings remained behind in the village. While this level of responsiveness to elder parent illness is significant, it is not absolute as parent illness only raises the probability of return migration. In addition, in the absence of children, neither market nor government currently provide significant alternatives for provision of instrumental care (Flaherty et al 2007; Flaherty, 2009; Green, 2010; Wu et al, 2009).

Rural-to-Urban Migration in China

During the 1990s, China's labor market experienced dramatic growth in the volume of rural migrants moving to urban areas for employment. Estimates using a one percent sample from the 1990 and 2000 rounds of the Population Census and the 1995 one percent population survey showed that the inter-county migrant population grew from just over 20 million in 1990 to 45 million in 1995 and 79 million by 2000 (Liang and Ma, 2004). Surveys conducted by the National Bureau of Statistics and the Ministry of Agriculture that included more detailed retrospective information on short-term migration suggest even higher levels of labor migration than evident in the census (Cai, Park and Zhao, 2008).

Before labor mobility restrictions were relaxed, households in remote regions of rural China faced low returns to local economic activity, reinforcing geographic poverty traps (Jalan and Ravallion, 2002). A considerable body of descriptive evidence related to the growth of

migration in China raises the possibility that migrant opportunity may be an important mechanism for poverty reduction. Studies of the impact of migration on migrant households suggest that migration is associated with higher income and consumption (de Brauw and Giles, 2008; Du, Park, and Wang, 2006), facilitates risk-coping and risk-management (Giles, 2006; Giles and Yoo, 2007), and is associated with higher levels of local investment in productive activities (Zhao, 2002).

Evidence from the migration literature thus suggests that absence of adult children may not leave the rural elderly worse off, particularly if they are remitting a share of their earnings sufficient to help elderly parents maintain their standard of living. Demographic trends in rural areas suggest, however, that the standards of living of the rural elderly may become more precarious in the future. Population pyramids for rural China are shown in Figure 3, including projections of the future population structure made using reasonable assumptions for fertility rates, the migration rate and age structure of migrants.⁸ Where the current old-age dependency ratio in China's rural areas is currently 14 percent, it is projected to be 23 percent by 2020 and rise further to 30 percent by 2030 (Cai et al, 2009). With these likely changes in the demographic structure of rural China, support for the elderly through co-residence, or residence in close proximity, is likely to decline further. A larger share of private support will have to come through the remittances of migrant adult children. Even now, concerns arise over both the uncertainty regarding migrant employment and consequent variance of income available for remittances, and the possibility that absent children may not have full understanding of parent needs. To this end, we next directly examine how private transfers respond to low income of the elderly. We take special care to examine whether transfer responsiveness differs for those elderly

⁸Cai, Giles and Wang (2009) develop a demographic model that projects the future age structure of rural and urban elderly under alternative fertility and migration rates. Projections in these population pyramids reflect the most-likely of alternatives considered in their paper.

households that have migrant children from those households which do not. While this exercise can only demonstrate the current risks associated with reliance on transfers, ongoing changes in the rural demographic structure make it likely that any risks will become more important in the future.

3. How Do Transfers Respond to Household Income of the Elderly?

A Framework for Analysis

Much early research on intra-family transfers used data from developed countries and focused on efforts to distinguish motives for transfers.⁹ Such distinctions may be important as they have implications for how transfers respond to exogenous income received by elderly households. Becker (1974) and Cox (1987) emphasize 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 , may incorporate the well-being of her relative, V_{ir} :

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

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 . If individuals care about each other, then we would expect $\partial U / \partial V > 0$ and $\partial V / \partial U > 0$, and this would raise the likelihood of observing altruistic transfers. Exchange motives may be present as well if i

⁹Barro (1974), Becker (1974) and Cox (1987) made important theoretical distinctions highlighting different motives for transfers. Much of the empirical research in the US has suggested that inter-generational inter-vivos transfers are driven by an exchange motives (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 on the flow of resources from older to younger generations.

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 the value of transfers out and I_i is the value of household income before receiving transfers, or pre-transfer income. If transfers are altruistically motivated, we expect $\partial T_i^I/\partial I_i < 0$, since donors believe that a larger transfer will be necessary to improve recipient welfare as pre-transfer income falls, while if exchange for services is the motive for transfers, then the sign will be ambiguous. When elderly lack income from labor supplied by co-resident family members and are either unable to work or unable to earn sufficient income from work, then we expect transfers to 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 pre-transfer income, $\partial T_i^O/\partial I_i$, should be positive when transfers are altruistically motivated, as when parent household 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:

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

where T_i^N are net transfers into the household, 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 into and out of the household. Given that two motives for transfers may exist, and may well differ in importance at different levels of pre-transfer income, we want to allow pre-transfer income, I_i , to have a non-linear effect on net-transfer responses.

Arguing that $f(I_i)$ may be non-linear due to a switch from altruistic to exchange motives for transfers at a particular threshold, Cox et al (2004) estimate transfer responsiveness using an approach that allows one to estimate the threshold empirically as well. Understanding where this threshold is relative to a nutrition-based poverty line or an eligibility line for minimum living standard support may be important for thinking about design of safety net programs that aim to provide publicly subsidized support for the poor. Yet, an empirical approach which forces $f(I_i)$ to be composed of two linear portions below and above a threshold may also be too restrictive. Earlier work examining transfers to elderly living in urban China raises doubt about the viability of the threshold model approach. Cai et al (2006) show that the threshold model introduced by Cox et al leads to a switch from altruistic motives at less than half the nutrition-based, basic-needs poverty line for urban China. While this shouldn't disqualify the approach altogether, the threshold also failed to fit the data very well.

Another approach to allowing $f(I_i)$ to be non-linear is to use a partial linear model for empirical estimation, and then empirically calculate transfer derivatives at different levels of I_i . We use the partial linear model introduced by Yatchew (2003) and implemented for analysis of transfers in Cai et al (2006). In this approach, observations in the sample are first ranked by I_i , and then differenced to obtain:

$$\Delta T_i^N = \Delta f(I_i) + \Delta \mathbf{X}_i' \boldsymbol{\gamma} + \Delta \varepsilon_i \quad (4)$$

By differencing after sorting by pre-transfer income, I_i , the contribution of $\Delta f(I_i)$, or $f(I_i) - f(I_{i-1})$, to ΔT_i^N will converge to 0 under the standard assumption that I_i is bounded as the sample size increases. Essentially, when $\Delta f(I_i) \approx 0$ we remove the effect of pre-transfer income from the relationship between other characteristics and net transfers, and equation (4) reduces to

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

As long as I_i and other independent variables are not perfectly correlated, OLS estimation of equation (3) will yield consistent estimates of $\boldsymbol{\gamma}$. We are then able to recover the non-parametric relationship $f(I_i)$, by using the estimated coefficients, $\hat{\boldsymbol{\gamma}}$ to calculate

$$u_i = T_i^N - \mathbf{X}_i' \hat{\boldsymbol{\gamma}} = f(I_i) + \varepsilon_i \quad (6)$$

Assuming that the ε_i are independent across households and identically distributed, u_i converges to $f(I_i)$ for large sample sizes. We then use locally weighted regression (also known as *lowess*) to estimate the non-parametric relationship between the response of transfers, $f(I_i)$, to pre-transfer income, I_i .¹⁰ Next, to provide a measure of how transfers are likely to respond to changes in pre-transfer income, we calculate the income-varying transfer derivatives of $f(I_i)$ as the slope of $f(I_i)$ in the neighborhood of $[I_i - 100, I_i + 100]$.

In order to highlight differences in how net transfers into elderly households vary with the migrant status of adult children, we perform the analysis separately for those households with and without migrant children. When thinking about the analysis below, it is important to recognize that we are not making any *causal* claims about the relationship between migration and financial support for the elderly, but providing description of observed patterns. First, it should be remembered that migration and transfer decisions are in some sense jointly determined, and that, as demonstrated by Giles and Mu (2007), migrant adult children may return to their home villages to support parents when they are too infirm to farm or to earn income from other sources. Thus the results from our analytical exercise should be viewed as

¹⁰Specifically, 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), and has a benefit over some Kernel estimators in that it does not suffer from bias near the end points.

descriptions of transfer behavior after adult child adjustments to migration status have taken place. Second, there are significant reasons why one might observe higher or lower transfers from migrant children that have nothing to do with migrant status per se. Migrants may have higher ability, and we might thus expect that they are likely to have higher incomes whether they migrate or find employment nearby. In this case, higher transfers to elderly parents may reflect unobserved dimensions of adult child ability. On the other hand, migrant children may have parents with higher ability, and even if these parents have low contemporaneous income, they may have sufficient (unobserved) savings and we may observe lower net transfers because their adult children recognize that they have a lower need. In our analysis, we reduce the first form of bias by controlling for the observable characteristics of children who make up the network of potential transfer providers. With respect to the second possible source of bias, unobserved elderly wealth, it is important to remember that the current elderly in rural areas had relatively little time to accumulate savings and lack land wealth. While this potential bias exists, we doubt that it is substantial in rural China today.

A second source of bias arises if pre-transfer income varies with labor input of household members. One may worry that the prospect of receiving a transfer creates an incentive for some elderly, or their co-resident children or other family members, to provide less labor to productive activities if they suspect that they will be insured against low income realizations. Other research in this area has explored the size of this bias in practice (Cai et al, 2006; Cox et al, 2004; Jensen, 2003) and finds only modest labor supply response to expected transfers, with economic magnitudes insufficient to alter conclusions regarding the responsiveness of transfers to low incomes. If anything, the concern that potential transfers have a causal effect on elderly household earnings may make transfers less responsive to low earnings (Cai et al, 2006).

The Data Source

For the analysis of private transfers, we use data from household and village surveys conducted by the Research Center for Rural Economy (RCRE) at the Ministry of Agriculture and a supplementary survey conducted in 55 villages of four provinces from August to October 2004 in collaboration between Michigan State University and RCRE.¹¹ All 3999 households in the 2003 wave of the RCRE panel for these four provinces were enumerated, allowing us to match villages and households from the 2004 supplemental survey with a historical panel of villages and households that RCRE surveyed annually from 1986 to 2003.¹² One unique feature of the supplemental survey is that it enumerated the educational attainment, birth year, current occupation, work and migration history, and residence location for all children and other current and former residents (including deceased former residents) of survey households. Using a calendar-based history to collect this information, the supplemental survey allows one to better characterize the individual characteristics of both household members and non-resident family members in all survey rounds from 1995 to 2003. This information is crucial for reducing biases that may be introduced when lacking information on the size and characteristics of the network of non-resident family members, which affect the quality of the transfer network.

Of the 3999 households that were resurveyed, 494 had at least one resident over age 60 in 1995 and this rose to 816 by 2003. These households comprise our analysis sample, which we split into an early period (1995 to 1998) and late period (2000 to 2003) in order to pick up

¹¹The Supplemental Rural Household Social Network, Labor Allocation and Land Use Survey was carried out in collaboration with Michigan State University in 2004. Details on the supplemental survey protocol and survey instruments can be found at www.msu.edu/~gilesj/.

¹²A detailed discussion of a larger nine-province sample from the RCRE panel dataset, including discussions of survey protocol, sampling, attrition, and comparisons with other data sources from rural China, can be found in the data appendix of Benjamin, Brandt and Giles (2005). This paper makes use of village and household data from the four provinces where the authors conducted follow-up household and village surveys, which are Shanxi, Jiangsu, Anhui and Henan.

changes in patterns of remittances which may be occurring as migration becomes more permanent. Table 3 summarizes key features of per capita *pre-transfer income*, or household income before receiving transfers, and net transfers, where *net transfers* are calculated as transfers into the household less transfers out. Considering income and transfers relative to the nutrition-based poverty line for rural China, 875 RMB Yuan per capita (measured in constant Year 2000 RMB Yuan), puts the economic environment of these households into perspective.¹³ First, incomes are not high. Average pre-transfer income, both for households with and without migrant children, is less than twice the nutrition-based poverty line in both periods. Second, the share of elderly living in households with pre-transfer per capita income below the poverty line has increased both for households with and without migrant children. In the early period (1995 to 1998), 29.3 percent of elderly households without migrants had pre-transfer incomes at or below the poverty line, and this rose to 38.7 percent by the later period (2000 to 2003). Among the elderly households who have migrant adult children, the share who would be in poverty in the absence of transfers was 37.2 and 44.9 percent in the early and late periods, respectively.

While elderly with adult children who are migrants would appear more likely to be below the poverty line in the absence of transfers, the share of elderly who would be very poor without transfers (pre-transfer income per capita less than one fourth of the poverty line) is somewhat higher for those households without migrant adult children. The higher *very poor* share likely reflects those households in which elderly family members are too infirm to work and for whom

¹³Of course, poverty lines may be somewhat arbitrary, and thus poverty researchers go to considerable lengths to use objective basis on which to develop a poverty line. Summarizing the general approach to estimating a nutrition-based poverty lines, the analyst must first estimate the cost of the underlying food requirements for the basket of foods that might be available for someone near poverty are first estimated. To this cost, costs of other durables and housing for someone near poverty are then added to the nutrition cost, and this value is used to determine the poverty line. Researchers working in the poverty field have thought very carefully about the objective calculation of poverty lines and a useful introduction may be found in Ravallion (1996). We use the nutrition-based poverty line calculated for rural China over the period of the study by Ravallion and Chen (2007), who have long experience working with China's National Bureau of Statistics (NBS) to develop objective, nutrition-based poverty lines for rural and urban China.

adult children may have returned to live locally in the village in order to provide instrumental care as well as financial or in-kind support (e.g., Giles and Mu, 2007).

Apart from the dependent variable, net transfer per capita, and pre-transfer income per capita, the linear portion of the model (3) includes controls for gender, age, years of schooling, and a dummy indicating presence of a spouse for the oldest household resident. At the household level, controls are included for whether there are any household members who are currently enrolled in school, and numbers of household residents in different demographic categories. To control for the size and *quality* (or earnings ability) of a potential transfer network, the regressors include numbers of non-resident children and their spouses in different demographic categories, and shares of these children and spouses who have completed middle and high school, respectively. Finally, the model estimated in (3) includes village dummy variables to control for time-invariant features of the local economic environment, and province-year dummies to control for macroeconomic shocks.

4. Results

Do Private Transfers Respond to Low Income of Elderly Households?

In Figure 4 below, we show the estimated transfer response, $f(I_i)$, calculated by implementing (3) and (4), for different levels of pre-transfer income, I_i . It is likely that transfer responsiveness from migrants may change as time away from home villages increases.¹⁴ We examine changes in transfer responsiveness over time by splitting the sample into an early period (1995 to 1998) and

¹⁴The World Bank Poverty Assessment (Chaudhury and Datt, 2009) emphasized showed that 65 percent of rural migrants had lived in the current city where they were working for more than three years, and this duration was significantly longer than reported in a similar survey conducted in 2001.

a later period (2000-2003).¹⁵ In each figure, we also separately show how transfers respond to pre-transfer income levels for elderly households that have migrant children and those that do not. In order to highlight how transfers respond to income at different points in the income distribution, we draw vertical lines at multiples of an annual nutrition-based poverty line of 875 RMB Yuan per capita, and then report the slopes calculated at these points in Table 4 below.

Evident in the left panel of Figure 4, transfers to elderly households were more responsive to income at low levels in the earlier period when elderly had migrant adult children than if they did not. Indeed, the slope, or transfer derivative, was not indistinguishable from negative one for elderly households with pre-transfer income below one half of a nutrition-based poverty line. This suggests that public transfers to the elderly with migrant children would have crowded out private transfers at very low levels of income. By income levels near the poverty line, however, the transfer derivative was -0.5 for elderly households regardless of whether or not they had migrant children. Thus, even in the earlier period, one would not expect private transfers to be crowded out completely by payments from a non-contributory pension in those elderly households already at or above the poverty line.

By the later period, we find that private net transfers into households with elderly become less responsive to income for households with migrant children. This decline in transfer responsiveness holds for the significant share of households with incomes ranging from half the nutrition based poverty line (or 438 RMB/capita) to twice this value (or 1750 RMB/capita), and indicates concerns about public transfers crowding out private transfers is becoming less relevant over time. Indeed, the decline in responsiveness of transfers to low income, which should be

¹⁵Again, in interpreting these figures, it is important to remember our caveats against interpreting these results in any way as the causal effect of migration. What they provide is descriptive evidence on transfer-responsiveness and transfers to elderly with and without migrant children net of any responses to parent needs for instrumental care or unobservable characteristics related to both parent or child ability, and ability to migrate.

interpreted as net of adjustments to migration status due to parental needs, raises the possibility that elderly may be more exposed to the risk of poverty with increases in out-migration of adult children and the increasing likelihood that migration of children is permanent.

Will Private Transfers Keep the Rural Elderly Out of Poverty?

When examining the responsiveness of transfers to pre-transfer income above, it is important to remember that the predicted transfer levels in Figure 4 must be interpreted as expected values conditional on level of pre-transfer income and other individual, household and family characteristics. Actual transfers received will vary around these predicted values. In order to assess the risk that private transfers are not sufficient to keep the elderly out of poverty, we use standard bootstrap procedures to estimate the distribution of transfers around these predicted transfer levels. In Figure 5 below, we reproduce the predicted transfers from Figure 4 with confidence intervals shown by dashed lines above and below the estimated transfer levels. We can be confident that 95 percent of the time the transfer corresponding to a given level of income will fall in the range between the dashed lines. Next, we plot the threshold combinations of pre-transfer income and net private transfers sufficient to keep elderly households above the nutrition-based poverty threshold. This threshold is represented in each of the four graphs of Figure 5 as the straight dotted line running from the net transfer axis when pre-transfer income is zero to the point on the pre-transfer income axis where net-transfers are -500 RMB/capita and the household pre-transfer income is just sufficient to keep the household out of poverty.¹⁶ If the combination of household pre-transfer income and net-transfers falls to the left of this threshold, then total income per capita of the household is below the poverty line. The top two panels show

¹⁶Raising the poverty threshold would imply shifting this line to the northeast, and as evident in Figure 5, and this would lead to increased risk of falling into poverty. Reducing the threshold would entail shifting this line to the southwest.

the range of net transfers for different levels of pre-transfer income during the 1995 to 1998 period for households without and with migrants, respectively. Comparing the top two figures, note that more of the lower bound of transfers lies below the poverty threshold for households that do not have migrant family members. Indeed, during the earlier period, elderly households with migrant family members appear very unlikely to have income per capita below the poverty line after private transfers are included household income. Consistent with Giles (2006), the migrant labor market appears to be providing sufficient insurance against falling into poverty.

Evident in the lower panel of Figure 5, households with migrant family members are actually at a greater risk of falling into poverty by the 2000 to 2003 period. Below, Table 5 summarizes the range of transfers at five multiples of the poverty line. From the values reported in Table 5, it is evident that elderly households with pre-transfer income per capita less than one-half the nutrition-based poverty line are at particular risk of falling into poverty. From Table 3, we know that in the later period this amounts to 17.5 and 15.7 percent, respectively, of the elderly without and with migrant children. As transfers have become less responsive to pre-transfer income even as risk of falling into poverty has increased, it is apparent that a positive role might be played by some type of government transfer, either the *dibao* or a non-contributory component of a pension. Given that transfers are unlikely to completely crowd out private transfers, a low base level of support would provide insurance against falling into poverty.

When thinking about the descriptive results on financial transfers above, it is important to keep in mind that financial transfers are only one form of transfer received by elderly from their adult children. As enumerated in the RCRE dataset the value of in-kind transfers in the form of food-stuffs and other consumable goods are included among these transfers, but there is no attempt to value time spent providing instrumental care, labor input to the elderly person's farm

land, or valuing time-spent providing companionship. While our analysis of financial transfers does control for the proximity of relatives within the community, which proxies for the availability of this type of care, such transfers are not directly observed. Given the poor development of markets for provision of instrumental care in rural areas (Flaherty et al 2007; Flaherty, 2009; Green, 2010; Wu et al, 2009), one might expect that those elderly whose children are not available when instrumental care is required may well be worse off.

5. Conclusions and Policy Discussion

We document the decline in incidence of co-residence with adult children, which has heightened concerns that elderly may lack family members committed to providing instrumental support when they are too infirm to care for themselves. Next, the paper presents patterns of net financial transfers to elderly households with attention to describing differences in patterns across households with and without migrant children. The expected levels of net transfers do not differ significantly across migrant and non-migrant households, but the paper shows that the predicted variance of net transfers for households with low pre-transfer income is greater for those elderly with migrant adult children. One interpretation of this descriptive evidence is that elderly with migrant adult children are at greater risk of falling into poverty. This vulnerability compounds any losses to welfare which occurs when elderly lack family members to provide instrumental care.

Population projections for rural China suggest that sharp increases in the old age dependency ratio are likely to take place over the next twenty years, and this will place increasing strains on traditional, family-based mechanisms of support for the elderly. In response to recognition of these expected demographic changes, China's government has recently initiated

new rural pension programs. As of the end of 2010 these programs had been introduced in 23 percent of rural counties, and are scheduled to be available throughout rural China by 2016 (State Council, 2009).

While implementation and program design varies somewhat by county, the new rural pension is not social insurance. The only form of insurance against poverty in old age is the locally targeted minimum living standard guarantee, or *dibao*. Indeed, mechanisms for supporting the current elderly in the design of the basic pension build off expectations that *altruistic* adult children would use “buy-in” features of the new pension system in order to guarantee income for their parents. Individuals may buy into the basic pension of 55 RMB Yuan per month by making a payment of 1500 RMB in order to have credit for the minimum 15 years of contributions. Alternatively, a “family binding” provision under the basic pension allows individuals over 65 to receive the basic pension if they have an adult child who is making contributions to his or her own individual account. In this sense, the design of the new rural pension aims to exploit altruistic preferences toward parents in order to encourage participation by younger generations. While the annual basic pension amounts to 660 RMB per year and is still below the nutrition-based poverty line, this still goes a long way toward reducing risks of absolute poverty for the rural elderly.¹⁷

Apart from the *dibao* and the basic pension, there are other reforms which have the potential for reducing risks faced by the elderly by removing disincentives for them to move with their adult children, and thus facilitating continuation of traditional family-based support. The current elderly remain in China’s villages even as the migrant status of their adult children takes on a permanent nature. The land tenure system, which only provides imperfect transfer rights, and the residential registration system (or *hukou* system) both raise the costs to families of

¹⁷In some provinces, the minimum basic pension is as high as 80 RMB per month, or 960 RMB per year.

moving elderly into the households of migrant adult children. Reforming these obstacles to mobility would facilitate movement of the rural elderly and continued use of support through co-residence with adult children.

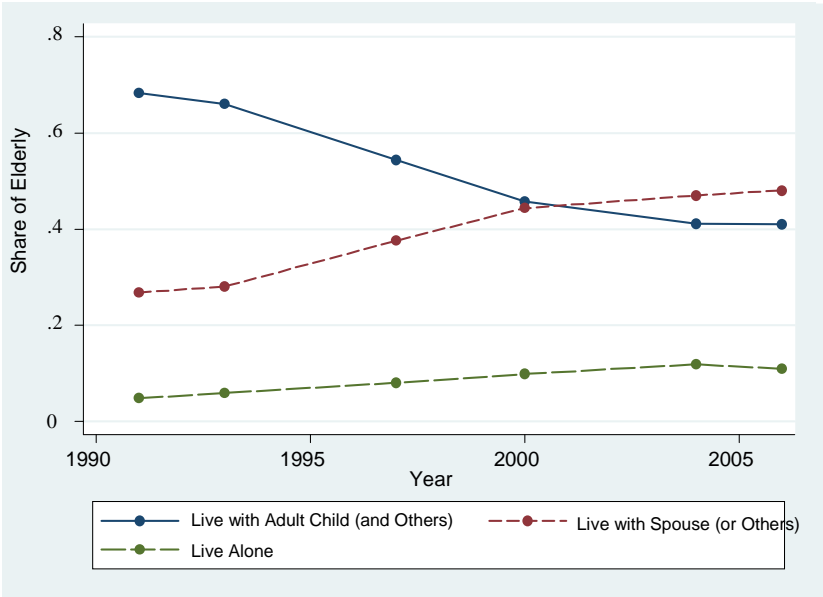
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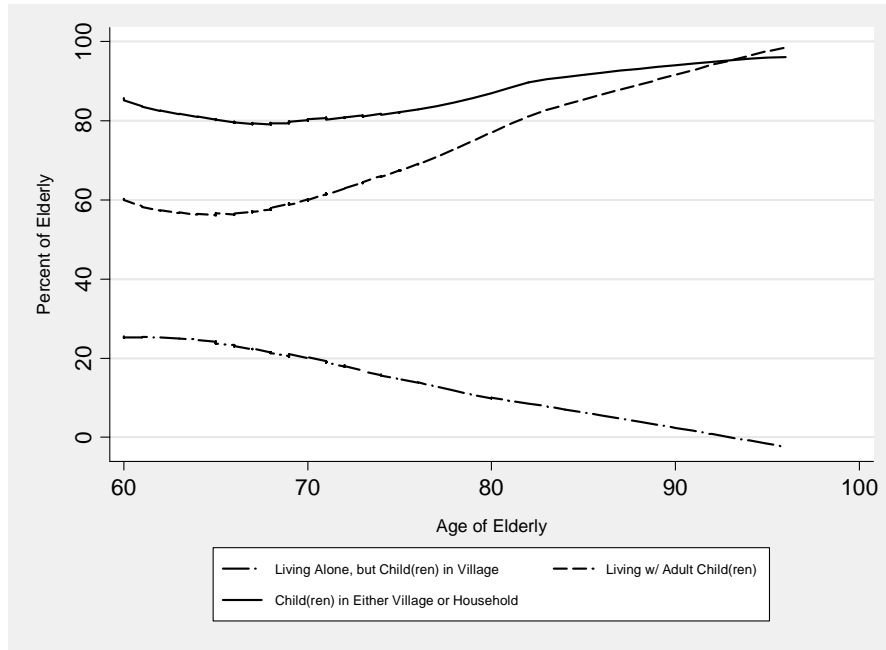
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Figure 1
Living Arrangements of China's Rural Elderly



Source: China Health and Nutrition Survey (CHNS).

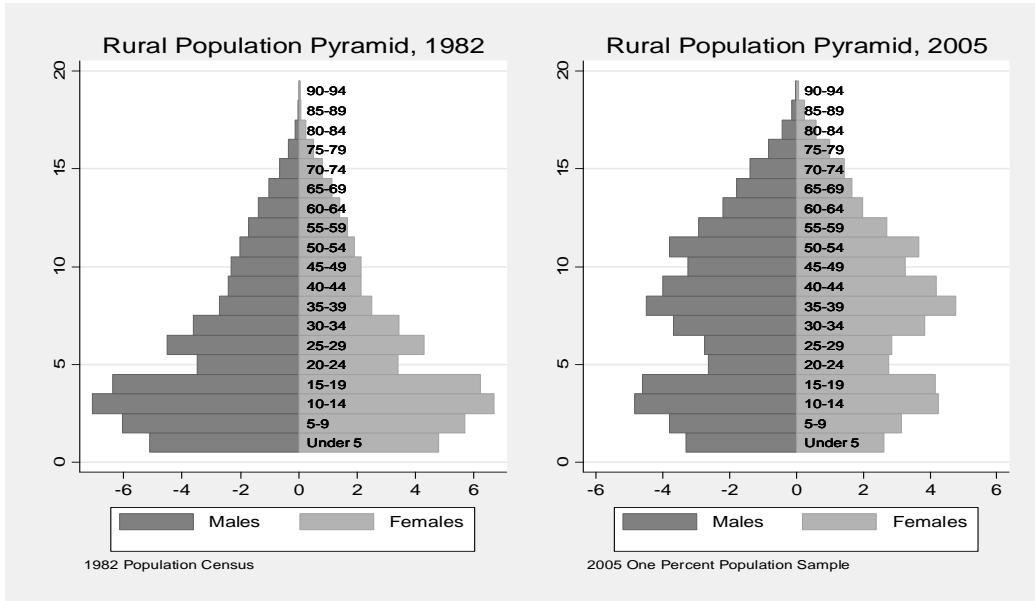
Figure 2
Living Arrangements of China's Rural Elderly
by Age



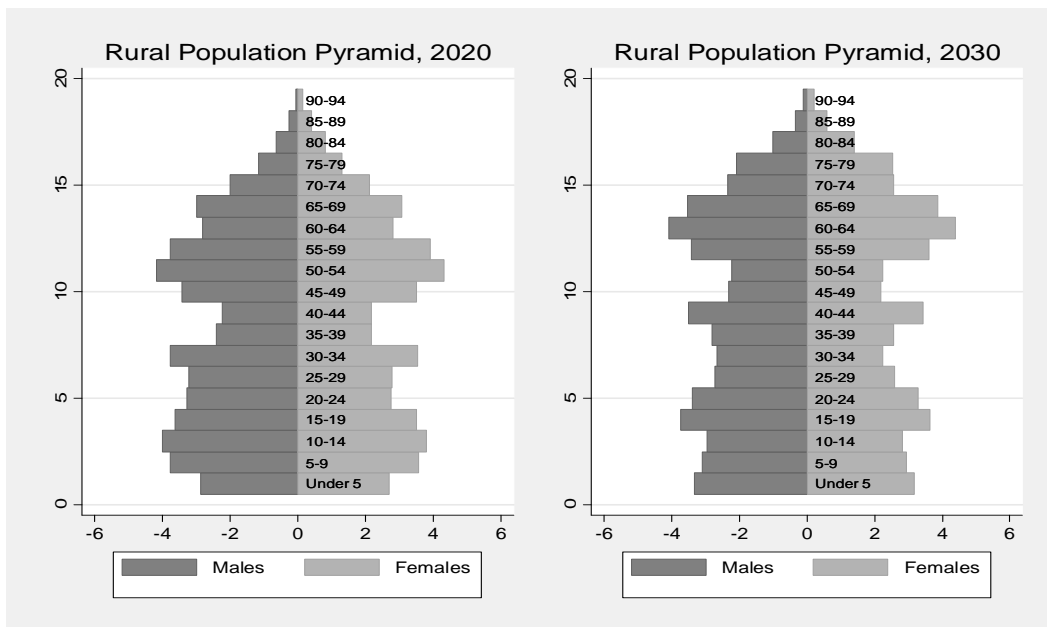
Source: RCRE 2004 Supplemental Rural Household Social Network, Labor Allocation and Land Use Survey.

Figure 3
Historical and Projected Population Pyramids for Rural China

A. Historical Population Pyramids for Rural China

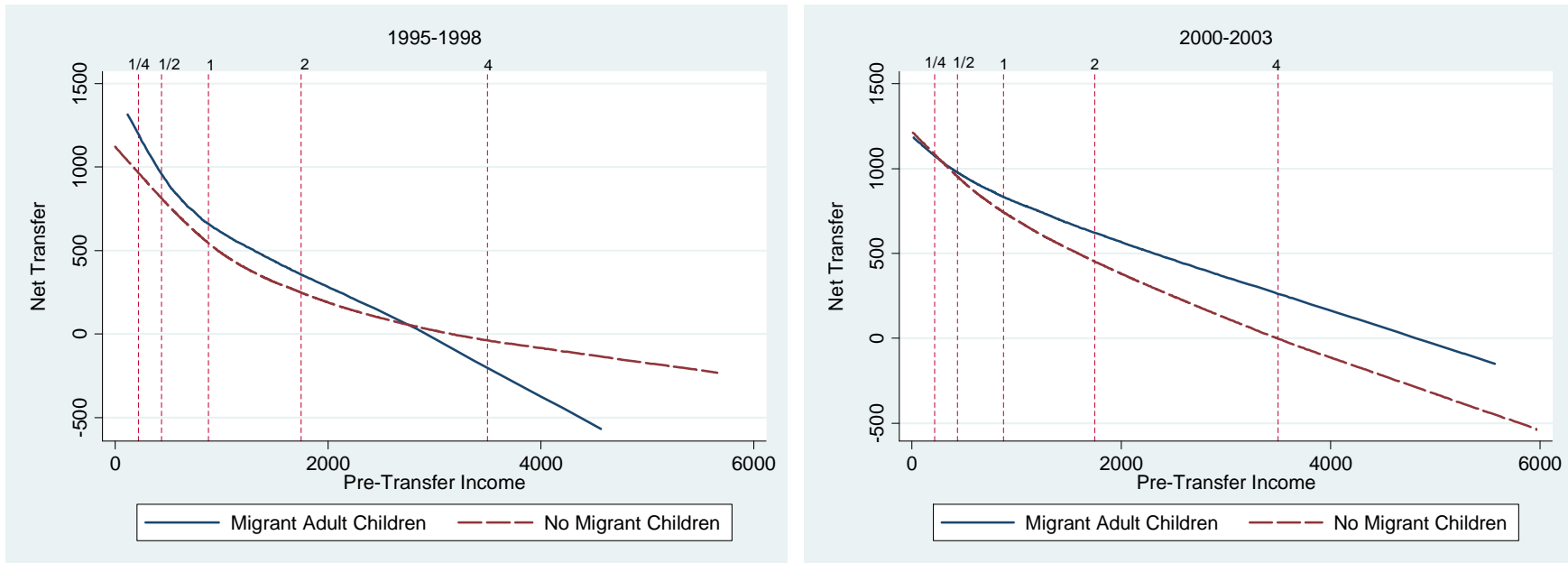


B. Projected Rural Population Pyramids in 2020 and 2030



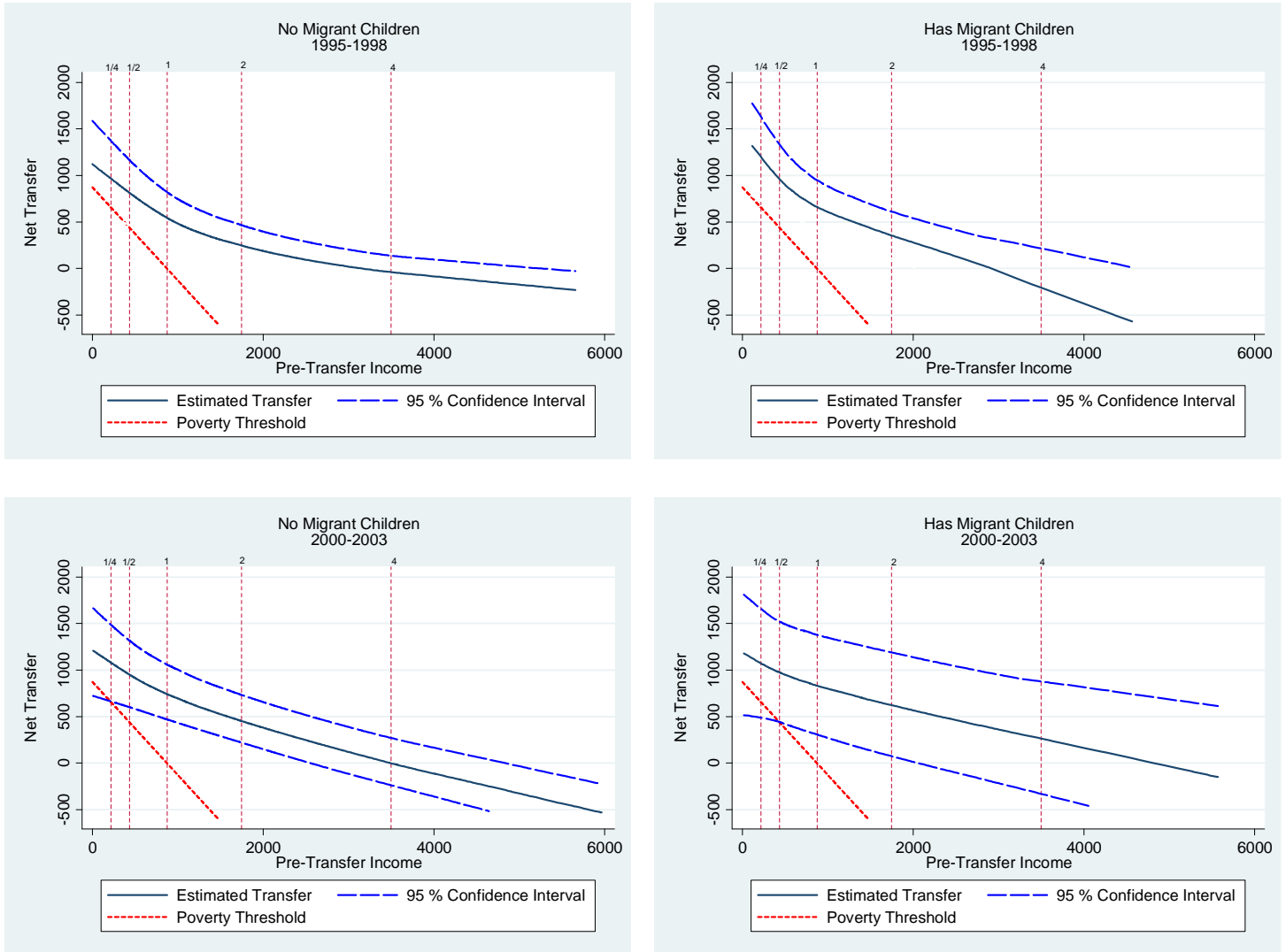
Source: Cai, Giles and Wang (2009). Historical population pyramids are calculated from the National Bureau of Statistics, 2005 One Percent Population Sample (2007), China Statistical Press. Yao, Xinwu and Yin Hua, China Normally Used Population Dataset, China Population Press (1994).

Figure 4
Net Transfers Received by Rural Elderly
by Migrant Status of Adult Children



Notes: Vertical lines indicate multiples of a nutrition based poverty line, which is equal to 875 RMB Yuan Per Capita in 2000 RMB. All values are in 2000 RMB Yuan per capita. We use the RCRE Rural Household Surveys for 1995 to 2003 from Anhui, Henan, Jiangsu and Shanxi and the matched RCRE 2004 Supplemental Rural Household Social Network, Labor Allocation and Land Use Survey.

Figure 5
Confidence Intervals for Net Transfers Received by Rural Elderly
By Migration Status of Adult Children



Notes: Vertical lines indicate multiples of a nutrition based poverty line, which is equal to 875 RMB Yuan Per Capita in 2000 RMB. All values are in 2000 RMB Yuan per capita. We use the RCRE Rural Household Surveys for 1995 to 2003 from Anhui, Henan, Jiangsu and Shanxi and the matched RCRE 2004 Supplemental Rural Household Social Network, Labor Allocation and Land Use Survey.

Table 1
Primary Sources of Support for China's Elderly, 2005
 (Percent Reporting as Most Significant Source of Support)

| | Urban | | | Rural | | |
|-----------------------|---------|------|--------|---------|------|--------|
| | Average | Male | Female | Average | Male | Female |
| Labor Income | 13.0 | 18.4 | 7.9 | 37.9 | 48.5 | 27.5 |
| Pensions | 45.4 | 56.9 | 34.6 | 4.6 | 8.1 | 1.3 |
| <i>Dibao</i> | 2.4 | 1.8 | 2.9 | 1.3 | 1.8 | 0.9 |
| Insurance and Subsidy | 0.3 | 0.3 | 0.2 | 0.1 | 0.2 | 0.0 |
| Property Income | 0.5 | 0.5 | 0.5 | 0.2 | 0.2 | 0.1 |
| Family Support | 37.0 | 20.7 | 52.3 | 54.1 | 39.3 | 68.5 |
| Other | 1.5 | 1.4 | 1.6 | 1.8 | 2.0 | 1.7 |

Source: National Bureau of Statistics, 2005 One Percent Population Sample Data, China Statistics Press, 2006.

Table 2
Sources of Support for China's Rural Elderly in 2005, by Age Category
 (Percent Reporting as Most Significant Source of Support)

| Age Group | 60+ | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85+ |
|--------------------------|------|-------|-------|-------|-------|-------|------|
| Labor Income | 37.9 | 64.3 | 45.1 | 24.4 | 12.0 | 4.3 | 1.7 |
| Pensions | 4.6 | 4.7 | 5.1 | 4.7 | 4.4 | 3.8 | 2.6 |
| Dibao | 1.3 | 0.8 | 1.2 | 1.5 | 1.9 | 2.0 | 2.1 |
| Insurance and Subsidy | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Property Income | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 |
| Family Support | 54.1 | 28.6 | 46.6 | 66.9 | 79.1 | 87.2 | 91.1 |
| Others | 1.8 | 1.2 | 1.7 | 2.2 | 2.3 | 2.4 | 2.3 |

Source: National Bureau of Statistics, 2005 One Percent Population Sample Data, China
 Statistics Press, 2006.

Table 3
Income and Transfers of Households in the Estimation Sample
(Standard Deviation in Parentheses)

| | 1995 to 1998 | | 2000 to 2003 | |
|--|----------------|---------------|----------------|----------------|
| | No Migrant | Has Migrant | No Migrant | Has Migrant |
| Pre-Transfer Income Per Capita | 1681 (1679) | 1342 (967) | 1766 (2131) | 1419 (1539) |
| Net Transfer Per Capita Into Household | 311 (739) | 495 (759) | 501 (1980) | 736 (1315) |
| Share with Pre-Transfer Income... | | | | |
| Under 1/4 Poverty Line | 0.046 | 0.020 | 0.083 | 0.059 |
| Between 1/4 and 1/2 Poverty Line | 0.062 | 0.069 | 0.092 | 0.098 |
| Between 1/2 and Poverty Line | 0.185 | 0.283 | 0.212 | 0.292 |
| Between Pov and 2*Pov Line | 0.362 | 0.393 | 0.273 | 0.301 |
| Between 2*Pov and 4*Pov Line | 0.272 | 0.190 | 0.223 | 0.184 |
| Greater than 4*Poverty | 0.074 | 0.045 | 0.118 | 0.066 |
| Observations (HHs with Resident Over 60) | 1,970 | 247 | 2,443 | 592 |

Notes: In the 1995 Survey Round 494 of 3999 households had a resident over 60, by the 2003 survey round 816 had a resident over age 60.

Table 4
Estimated Transfer Derivatives for Households with Elderly
Residents Estimated in the Neighborhood of Multiples of the Poverty Line

Panel A: 1995 to 1998

| Multiple | Income/Capita Range (in RMB) | No Migrant Child(ren) | Has Migrant Child(ren) |
|-------------------------|---------------------------------|--------------------------|------------------------------|
| ¼ Poverty Line | 119 to 319 | -0.84 | -1.73 |
| ½ Poverty Line | 338 to 538 | -0.73 | -1.03 |
| Poverty Line | 775 to 975 | -0.52 | -0.49 |
| Twice Poverty Line | 1650 to 1850 | -0.28 | -0.4 |
| Four Times Poverty Line | 3400 to 3600 | -0.11 | -0.31 |

Panel B: 2000 to 2003

| Multiple | Income/Capita Range (in RMB) | No Migrant Child(ren) | Has Migrant Child(ren) |
|-------------------------|---------------------------------|--------------------------|------------------------------|
| ¼ Poverty Line | 119 to 319 | -0.67 | -0.63 |
| ½ Poverty Line | 338 to 538 | -0.57 | -0.35 |
| Poverty Line | 775 to 975 | -0.46 | -0.25 |
| Twice Poverty Line | 1650 to 1850 | -0.35 | -0.21 |
| Four Times Poverty Line | 3400 to 3600 | -0.24 | -0.20 |

Note: All values are in 2000 RMB Yuan per capita. The nutrition based poverty line is equal to 875 RMB Yuan per capita. We use the RCRE Rural Household Surveys for 1995 to 2003 from Anhui, Henan, Jiangsu and Shanxi and the matched RCRE 2004 Supplemental Rural Household Social Network, Labor Allocation and Land Use Survey.

Table 5
Estimated Range of Transfers to Households with Elderly Residents
 Results for Neighborhoods of Different Multiples of the Poverty Line

| Multiple of the Poverty Line | Pre-Transfer Income/Capita Range | Portion of Estimated Range | 1995-1998 | | 2000-2003 | |
|------------------------------|----------------------------------|----------------------------|--------------------|------------------------|--------------------|------------------------|
| | | | HHs w/Out Migrants | HHs w/Migrant Children | HHs w/Out Migrants | HHs w/Migrant Children |
| One Quarter Poverty Line | 119 to 319 | Upper Bound | 1356 | 1643 | 1489 | 1655 |
| | | Mean | 948 | 1216 | 1081 | 1071 |
| | | Lower Bound | 531 | 718 | 664 | 479 |
| One Half Poverty Line | 338 to 538 | Upper Bound | 1155 | 1276 | 1293 | 1484 |
| | | Mean | 811 | 910 | 942 | 953 |
| | | Lower Bound | 469 | 610 | 601 | 461 |
| Poverty Line | 775 to 975 | Upper Bound | 785 | 908 | 1019 | 1381 |
| | | Mean | 517 | 648 | 709 | 821 |
| | | Lower Bound | 307 | 420 | 473 | 290 |
| Twice Poverty Line | 1650 to 1850 | Upper Bound | 421 | 605 | 701 | 1192 |
| | | Mean | 212 | 369 | 433 | 615 |
| | | Lower Bound | 87 | 120 | 216 | 55 |
| Four Times Poverty Line | 3400 to 3600 | Upper Bound | 125 | 216 | 259 | 862 |
| | | Mean | -48 | -137 | -7 | 274 |
| | | Lower Bound | -185 | -568 | -249 | -345 |

Note: All values are in 2000 RMB Yuan per capita. The nutrition-based poverty line is equal to 875 RMB Yuan per capita. We use the RCRE Rural Household Surveys for 1995 to 2003 from Anhui, Henan, Jiangsu and Shanxi and the matched RCRE 2004 Supplemental Rural Household Social Network, Labor Allocation and Land Use Survey.