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DISSERTATION

Dynamics and Determinants of Family Transfers

The Mexican Case

Claudia María Díaz Fuentes

This document was submitted as a dissertation in June 2012 in partial fulfillment of the requirements of the doctoral degree in public policy analysis at the Pardee RAND Graduate School. The faculty committee that supervised and approved the dissertation consisted of Chloe Bird (Chair), Emma Aguila, and Jeremy Miles.



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Introduction

For older adults with limited access to social security and pension savings, children assume the role of providers of financial resources and personal care, among other types of family transfers. This is the case for many older adults in the developing world as well as for those in developed countries who become vulnerable during periods of economic downturn. This and the ongoing demographic transition towards old age common to many developing and most developed nations, raise questions about the interactions between policies and the increased involvement of children in their parent's income security and well being.

This dissertation studies the case of Mexico to address some of these concerns. Several features make lessons from this country relevant. First, in Mexico children are one of the main sources of income for older adults. In fact, financial transfers from children provide 29 percent of the income of adults 60 and older, while pensions and public transfers account for another 35 percent. Second, the country's demographic transition will shift the proportion of adults 60 and older from 8 percent of the total population in 2005 to 27 percent in 2050 (Aguila, Diaz et al. 2011), increasingly requiring involvement from children to provide for their parents, an issue made worse by the limited coverage of the social security and pension systems. One of the main long term risks in this is that Mexico, as well as other countries and populations under similar circumstances, could be facing another mechanism of intergenerational transmission of poverty as the number of older adults increases.

From a policy perspective, concerns rise about the way in which public programs affect private mechanisms of support. The three aims of this dissertation address different aspects on this regards.

The first aim is to study the determinants and motives of financial or in-kind transfers from children to older adults, and contributes to the literature in its assessment of frequent and infrequent transfers. The study of transfers by their frequency speaks to differences each may have on older adults' consumption. Specifically, frequent transfers are associated here with every-day consumption needs, whereas infrequent transfers are associated with life shocks, such as illness or widowhood, and casual gifts. In this aim, the study of determinants focuses on the characteristics of the family structure, as well as characteristics of parents and children and their role on the transfer decision making of adult children. The study of motives, on the other hand, sheds light on the effect of policies on children's decisions to transfer. In particular, this allows determining if, in light of a policy that provides income for older adults, children will decide to discontinue providing for their parents. Results indicate that having at least one child living in the United States was the most important of children's characteristics in explaining the likelihood and amount of infrequent transfer, a result that could be associated to the costs of transaction of international remittances, as well as differences in the amount of transfers from migrant children when parents suffer a life shock. Furthermore, results also point out that old age income security policies will not crowd out infrequent transfers, but may do so with frequent transfers.

The second aim of this dissertation is to study the role of spouses and siblings on middle and old age adults' decision to transfer money and time to their parents. For middle and old age adults caring for their parents is accompanied by the challenges of their own retirement or their transition towards retirement. Furthermore, parents of middle and old age adults are likely to be among the oldest old, which means their needs might extend beyond financial support as their health status declines. In this context, spouses and siblings are likely to greatly influence transfer decisions. This analysis of the role of spouses uses a bargaining power framework in which bargaining power allows a spouse to control certain proportion of the couple's resources. The level of bargaining power, in turn, is determined by earnings, assets and gender roles of each spouse. More bargaining power here is expected to increase children's likelihood to transfer, implying that traditional gender roles that render women less likely to have earnings of their own will

make them less likely to provide for their parents. In the case of siblings, their assistance to parents might either complement an individual's transfers if siblings give when other siblings do the same. Alternatively, siblings can substitute each other. For instance, when a sibling who provides personal care to the parent enters the labor market, other siblings may step in and provide the service instead. In addition to sibling's actual transfers, this dissertation also addresses the role of agreements between siblings to share responsibility for their parents' needs insofar as children providing for their parents today may do so in the expectation that their siblings will do so as well. Results show that more bargaining power increases women's likelihood of transferring money to their parents. However, transfers of time are less likely for women with more say than their spouse in family decisions whereas having more say than spouse does not influence men's decision. Results about siblings' role on transfer decisions showed that respondents are more likely to transfer money or time if siblings provide or have agreed to provide money or time. The result about siblings' actual transfers indicates that respondents and siblings' transfers are complementary insofar as having one sibling giving transfers increases the likelihood of an individual to do the same.

Finally, this dissertation's third aim is to study the effect of Mexico's conditional cash transfer program, known as Oportunidades, on financial or in-kind transfers poor urban households give to and receive from friends or family. The Oportunidades program is Mexico's largest antipoverty program and provides cash transfers to one fourth of all Mexican families, all of whom live under poverty. The program conditions the transfer on behaviors aiming at increasing the beneficiaries' human capital to disrupt the intergenerational cycle of poverty. Given the extent of the program's coverage, this evaluation allows a first hand look at the direct policy effect on private transfers that poor urban households give and receive. Furthermore, the emphasis of the program in providing the cash transfers to women and its conditional nature allows for cross-comparisons with results from the literature studying programs that differ in their implementation and target. Results show that the program does not affect household's decision to give transfers and not all households see an effect on the amount of transfers they receive from friends and family. However, results show that in female-headed

households the program crowded out \$0.38 cents of private transfers received for every peso provided by Oportunidades. Given previous research has shown that non-conditional programs yield near complete crowding out, this result suggests the conditional nature of the program could prevent private donors from further decreasing the amount of transfers.

Overall, this dissertation aims at informing policies that interact with private transfer decisions on vulnerable populations. The findings' relevance extend beyond Mexican borders since much of the developing world, as well as populations in developed countries, face limited access to long term savings mechanisms and social security systems and an increasingly aging population.

Aguila, E., C. Diaz, et al. (2011). "Living Longer in Mexico: Income Security and Health." Santa Monica, CA: RAND Corporation.

Chapter 1: Analysis of determinants and motives for upstream frequent and infrequent transfers

1.1. Introduction

In countries with limited access to credit markets, health insurance and retirement savings mechanisms children play an important role ensuring their parents' consumption needs at old age are met. Previous research has shown that transfers from the younger to the older generation, also known as upstream transfers, are determined by sociodemographic characteristics of the children, the parent, as well as policies that address old age income insecurity. Furthermore, research shows that the effectiveness of such policies is also related to children's motives to transfer. In spite of an extensive body of literature addressing transfer determinants and motives, little is known about determinants and motives of frequent and infrequent upstream transfers. This distinction is relevant if frequent transfers respond to older adult's every-day consumption needs, whereas infrequent transfers respond to life events or are casual gifts.

This chapter's aims are to study the determinants of frequent and infrequent upstream financial or in-kind transfers, and to assess children's motives to transfer using available data from Mexico. The study of determinants of upstream transfers is based on stylized facts from the literature and the analysis of motives is guided by the theories of altruistic and exchange motives.

The relevance of assessing motives lies in their relationship with policies addressing old age income security. In particular, these frameworks predict that policies that increase older adult's income will displace or crowd-out transfers from altruistic children, whereas this is unlikely among children driven by exchange motive. Previous work (Künemund and Rein 1999; Kohli, Künemund et al. 2005) suggests that more than one motive might drive transfer decisions. Therefore, this chapter studies differences in motives of frequent and infrequent transfers.

To date, there are two studies assessing transfers by their frequency. First, a study by Kunemund and Rein (1999), who examine cross-sectional data for Canada, Japan, the United Kingdom, France and the United States. The study concludes that the welfare system may cause both crowding out as well as crowding in. When crowding out occurs, the welfare system displaces private transfers since children stop providing due to the existing government program. The authors argue that the welfare system also motivates other types of transfers between family members such as personal care. Therefore, it is crowding in different forms of intergenerational support. The authors acknowledge that in contexts where transfers respond to recipient's needs, this framework may not apply.

The second study addressing transfers was done by Park (2010) using data from Korea which classifies transfers made in regular and irregular intervals. Results show that frequent transfers are driven by parental need, whereas infrequent transfers remain irresponsive to them. The author also studies the role of traditional family relations and concludes that parents whose first born is a son are more likely to receive regularly, and to receive more. Park (2010) concludes that there is no single transfer motive. Instead, the author finds that the regularity or irregularity of transfers is associated to different motivations.

This chapter's contribution involves assessing the determinants and transfer motives of upstream frequent and infrequent transfers in the context of a developing country. Results about the determinants of transfers show that infrequent transfers are associated to having children who have migrated to other countries, while frequent transfers are responsive to parent's labor force participation decisions. Evidence about transfer motives, on the other hand, shows that predictions of the exchange motive framework explains infrequent transfers, whereas results for frequent transfers could respond to either altruism or exchange motives.

This chapter is organized as follows. The second section offers a brief overview of the literature about the determinants of transfers, the exchange and altruism models and their

main predictions, as well as evidence from empirical research. The third section explains the data and estimation strategies. The fourth provides results from the estimators on the transfer decision and amount, while the fifth section concludes.

1.2. Literature review

a. Transfer motives theory

The literature about transfer motives hypothesizes that transfers may be motivated by altruism or by the expectation of receiving something in exchange (Becker 1974; Cox 1987). The altruism and exchange hypotheses have been widely tested because their predictions provide relevant policy implications. In short, the altruistic model implies that if a donor is altruistic and the recipient's income increases exogenously by one dollar, the altruistic donor will take away one dollar of transfers, a prediction that raises concerns about the relationship between public programs and private transfers.

The altruistic framework (Becker 1974) states that individuals are better off if their family members are better off, so that individuals maximize utility as a function of their own consumption and the utility of those they care about (Cox 1987; Laferrere and Wolff 2006). This model assumes that all parties remain informed about each other's consumption needs and resources available to them.

The altruism hypothesis concludes that if one individual is worse off (e.g. loss of income resulting in lower consumption), the altruistic family member will provide resources until the recipient of those resources and the donor have the same level of utility. As a result, if donors observe a rise in the recipients' income, donors will decrease their amount of transfers by the same amount as the recipients' increase in income so as to keep all parties at the same level of marginal utility. Here, the recipient's increase in income is seen as crowding out transfers from the donor.

Criticism to the altruism model rises from its key assumptions, namely *(i)* the donors are dominant agents insofar transfer decisions rely on their own preferences and do not take

the recipient's preferences into account, *(ii)* perfect information about the recipients' income and consumption, *(iii)* optimal consumption choices on the basis of pooled income (which occurs partly due the first two assumptions) and finally, *(iv)* donors do not expect anything in exchange (Cox 1987; Cox and Rank 1992; Cox and Jakubson 1995; Cox, Eser et al. 1998; Cox, Hansen et al. 2004).

Cox (1987) developed a model that responds to criticism of this last assumption by introducing bi-directional transfers among donors and recipients, where donors provide a financial transfer and, in exchange, recipients provide a service. This service provides a positive marginal utility for the donor, and negative for the recipient. The author splits the transfer decision in two stages: first, donors decide whether to transfer, and then decide the amount of the transfer, if any.

To address the transfer, Cox (1987) uses a Nash bargaining framework in which children are no longer the dominant agent and have to negotiate with parents since they provide a service that makes children better off. From this framework, the author concludes that the decision to transfer is positively associated with an increase in the donor's income and negatively associated with an increase in the recipient's income under altruism and exchange motives. In other words, Cox (1987) concludes that the probability of transfers will decline with an increase of the recipient's income whether the donor's transfer decisions are driven by exchange or by altruism. The author explains that altruistic donors who see the recipient's income rise are less likely to give because there is no negative shock to recipient's utility. In the case of exchange, an increase in recipient's income means their marginal utility of consumption has declined. Therefore, to provide the first unit of service (which gives them disutility) recipients require higher compensation from the donor. Donors find this an "expensive" service and become less likely to transfer.

Cox's conclusion implies that it is not possible to identify motivation (and, therefore, the presence of crowd out) through the analysis of the decision to transfer. Both Becker (1974) and Cox (1987) show that it is possible to test the altruism hypothesis by

subtracting the change in transfers due to a change donor's income from the change in transfers due to a change in recipient's income. . In the case of altruism, the difference between these derivatives under altruism equals 1. This means that for each dollar the recipient's income rises, one dollar of transfers is crowded out. Empirically, this requires information about donor's income, which is unavailable in the data used in this chapter. However, information about the recipient's income allows testing a set of predictions about donors driven by the exchange motive.

In the exchange motive framework, transfers are a function of the amount of services the recipient provides and the price of such services. Furthermore, the price for the service rises with the recipient's income. Therefore, an increase in the recipients' income decreases the amount of services provided¹. Donors in need of their recipient's service will provide larger transfers because they are willing to pay the higher price, whereas those in little need for the service will transfer a lower amount. In other words, in the case of the exchange hypothesis, the change in the amount of transfers when parent's income rises depends on the donor's price elasticity of demand of the service.

The comparative statics of the exchange and altruism hypotheses are summarized in Table 1.1. Each cell shows the direction of change in the likelihood and the amount of transfers under each hypothesis given a rise in the income of the donor or the recipient.

Table 1.1 – Comparative statics under the exchange and the altruism hypotheses, given a rise in the income of the donor and the recipient.

	Change in Pr(T>0)		Change in Transfer amount	
	Exchange	Altruism	Exchange	Altruism
Donor's income rises	+	+	+	+
Recipient's income rises	-	-	- if elastic 0 if not elastic + if inelastic	-

Sources: Cox (1987) and Cox and Rank (1992)

¹ Higher income means that the marginal utility of each additional dollar provided by the donor is smaller. Therefore, the donor must compensate with more transfers the decreasing utility of consumption of the recipient.

From Table 1.1 it is clear that motivations cannot be determined through the study of the likelihood of transfers and that the exchange hypothesis can be supported if the amount of transfers increases or remains unchanged with an increase in the recipient's income. The results section provides evidence regarding the predictions of the exchange motive based on respondent's income.

b. Empirical evidence about transfer motives

Empirical results for the United States favor the exchange hypothesis. Cox and Rank (1992) use the National Survey of Families and Households (NSFH) and find that even though transfers are less likely to occur if the recipient is a beneficiary of a government program, there was no effect in the amount of private transfers received among those already obtaining them. In other words, there was no crowding out on the amount received. The authors also find that an increase in donors' income decreases the probability of transfers, but raises the amount given. This conclusion is consistent with the expected outcomes of the exchange model: a wealthier donor will require more services to provide transfers. Recipients might refuse to pay the additional premium, so transfers become less likely to occur in the future.

Other authors have measured the extent of crowd out as an indicator of the motivations to transfer. For instance, Altonji, Hayashi and Kotlikoff (1997) find that donors do not take away one dollar of family transfers for each dollar that the recipient's income raises. Instead, they take away between 0.054 and 0.123 cents per dollar increase. Such results favor the exchange motive hypothesis.

This evidence against the altruism hypothesis is found (Laferrere and Wolf, 2002) in countries where welfare and social security systems are well established. Cox, Hansen and Jimenez (2004) argue that the extent to which government policies may reduce altruistic behavior, particularly long term transfer behavior, might partly depend on how used individuals are to the idea that they count on public programs' assistance. If individuals know such programs exist they may account for them when optimally deciding on their own consumption bundle and that of their family members'. This means

that older adults can rely on social security to meet their needs and will have no incentive to engage in an exchange behavior for their children's support. On the other hand, countries in which welfare and social security are not generally available, individuals may be more sensitive to an increase in income of the recipient.

The authors research this idea using the case of the Philippines where access to welfare is unequal over the income distribution. To model this, they define an income threshold on a continuous linear spline with a single knot. They show that individuals whose income was below the identified threshold saw transfers decline 0.40 cents for every dollar of increase in recipient's income whereas for those above, there was a decline of 0.03 cents. Similar results have been found using Chinese data (Cai, Giles et al. 2006), where individuals with income below a threshold point face a decrease in transfers between 0.52 to 0.68 cents depending on the measure of income utilized.

Finally, Park (2010) concludes that, among Korean children, there is no single motive to transfer and that family composition affects transfer decision and amount. The author shows that coefficients on frequent transfers are negative and sensitive to changes in parent income, though not to wealth. He interprets this as evidence leaning in favor of the altruism hypothesis. Unlike frequent transfers, however, infrequent transfers are not statistically significant with respect to parent income or with respect to wealth.

c. Empirical evidence about the determinants of upstream transfers

In addition to income, empirical research about upstream transfers consistently shows that transfers are affected by the gender of the parent and the child, their work and marital status, level of schooling, older adult's health status and number of children. The relationship between transfers and these variables, however, is not always the same across countries.

Research shows that women are more likely to be recipients of financial transfers. This finding is consistent across studies in European countries, Korea, South Africa and Pakistan, where women receive larger amounts of financial support when they fall under

the poverty line (Maitra and Ray ; Attias-Donfut, Ogg et al. 2005; Bonsang 2007; Park 2010). Marital status, on the other hand, shows that in the United States, several European nations and Mexico, women are more likely to receive upstream transfers of money, time or in-kind, if they are unmarried (Altonji, Hayashi et al. 1997; Attias-Donfut, Ogg et al. 2005; Wong and Espinoza 2005; Bonsang 2007). Furthermore, the likelihood of becoming a transfer recipient increases over time for widows (Wong and Espinoza 2005) whereas re-married women are not more likely than men to receive upstream support (Altonji, Hayashi et al. 1997).

Transfer patterns differ with children's characteristics. In general, daughters, particularly married ones, are likely to provide time and care rather than financial assistance to their parents (Coward and Dwyer 1990; Cox and Rank 1992). Results for the United states, for instance, shows that women are less likely to provide time transfers once they enter the labor market (Zissimopoulos 2001), while in Korea male oldest sons are the most likely providers of financial transfers (Park 2010).

Having more children increases the likelihood and amount of transfers that older adults receive. This result is consistent across countries, such as China (Cai, Giles et al. 2006), where the generation of adults under the one-child policy had substantially lower transfers than previous cohorts, the United States, Canada, Japan, the United Kingdom, and Germany (Künemund and Rein 1999). On the other hand, once there are grandchildren,, upstream transfers of money are less likely to occur (Bonsang 2007). Finally, in the case of Mexico, research shows that upstream transfers are more likely to occur whenever one or more of the children live abroad (Wong and Espinoza 2005).

Cox and others' (2006) study of eleven developing countries show that the relationship between age and financial transfers follows a U-shaped pattern since transfers are large when individuals are young and decline continuously until certain point, after which they begin to increase again. Similar results have been found in Mexico and Europe (Attias-Donfut, Ogg et al. 2005; Wong and Espinoza 2005).

Insofar as health is an indicator of an individual's ability to earn a living (Künemund and Rein 1999), authors have hypothesized that less healthy older adults will need more of their children's assistance. Research shows that health shocks associated to the deterioration of older adults' physical functioning result in a higher likelihood of upstream transfers. In particular, such health shocks will result in the increased likelihood of co-residence (Cai, Giles et al. 2006; Ulker 2008), and/or time transfers (Wolff 2006; Bonsang 2007). For instance, Cox and others (2006) find that, in developing countries, the fraction of households receiving transfers is higher when at least one member had a chronic illness severe enough to limit the activities of daily living or the ability to work. In contrast, research for Mexico shows that health status is associated to a higher likelihood of becoming a recipient of time transfers, but not financial transfers (Wong and Espinoza 2005).

The literature of upstream transfers shows that donors have better socioeconomic status (SES) than recipients (Lillard and Willis 1997; Reil-Held 2006; Wolff 2006). This finding applies if SES is measured through employment status, wealth or income (Altonji, Hayashi et al. 1997; Cox, Hansen et al. 2004). Results are less uniform when using education as measure of SES. In some cases, transfers show a positive association with the likelihood of transfers (i.e. more educated parents are more likely to receive transfers from their children). Such is the case of Indonesia, the Philippines and several European countries (Cox, Hansen et al. 2004; Raut and Tran 2005; Bonsang 2007). In other cases, like Mexico, more years of schooling reduces the likelihood of becoming a recipient of financial support and, instead, increases the chances of becoming a donor of economic support for children (Wong and Espinoza 2005).

1.3. Data and Methods

a. Data and study variables

The data in this chapter come from the Mexican Health and Aging Study (MHAS). MHAS is a longitudinal survey nationally representative of Mexican adults 50 and older collected in 2001 and in 2003. The questionnaire collected information about the selected

respondent and spouse, if present, regarding their health, sociodemographic characteristics and income from labor and other sources. It also collected sociodemographic information about all household members and children of the respondent or spouse who lived outside the household.

In total, the 2001 wave collected data for 9,862 households. In order to identify individuals who were and those who were not transfer recipients in each year, the questionnaire asked: *“In the last two years, have you (or your spouse) received financial or in-kind support from any of your children and/or grandchildren (and those of your spouse)?”* Of the 9,862 baseline respondents, 49 percent (n=4,837) answered they received financial or in-kind support, while 44 percent said they had not (n =4,358) and the remaining 7 percent did not respond.

In 2001, respondents who received financial or in-kind support from their children reported if they received \$5000 pesos or more (US\$701.6 dollars of 2005) over the two years prior to the survey². Of the total baseline sample, 34 percent said they received less than \$5000 pesos. Respondents who received \$5000 pesos or more responded how much each child had provided, how often, whether they could count on this income in the future and if they believed they would have to reciprocate such help³. It’s worth noting the censoring of data on transfers is similar to that of the Health and Retirement Study (HRS) in the United States, which excludes gifts under \$500 over a two-year period as to avoid the inclusion of casual gifts. A possible limitation in this dissertation is that the \$5000 pesos cutoff over two years used in MHAS (roughly US\$700 of 2005 adjusted for purchase parity power⁴) may exceed the typical casual gift amount given differences in purchase parity power (PPP) and older adults’ disposable income. As discussed bellow, I address this by including estimations with the follow up wave, which asked all respondents to report the amount received.

2 *In total for the 2 years, was this assistance equal to \$5,000 pesos or more (or about 200 pesos a month)?*

3 For imputation purposes, those who did not report an amount responded whether transfers were above \$2,400 pesos or \$5,000 pesos over a two-year period. Therefore, some of the imputed amounts are bellow the \$5000 pesos threshold

4 Purchase Parity Power (PPP)

Dependent variables

Similarly to Cox (1987), the analysis here is split between the likelihood of receiving transfers and the amount of transfers received. The analysis of the amount of transfers presented here also distinguishes between frequent and infrequent transfers. Frequent transfers are defined as transfers that were reported as weekly or monthly. Infrequent transfers occurred once or yearly over the two years prior to the survey⁵. Selected respondents were classified as recipients of frequent transfers if at least one child provided frequent transfers and as recipients of infrequent transfers if all children provided yearly or one-time transfers. The dependent variable is defined as a binomial if respondents received transfers, and as multinomial to account for frequent, infrequent and no transfers. The conditional amount of transfers is the natural logarithm of the yearly dollar amount of transfers in order to smooth the distribution.

Even though the methodological section discusses the censoring and potential self selection, it is worth clarifying that the censored observations are those for which individuals received transfers but did not report the amount. However, since concerns might rise about selection from non-recipients, alternative estimations deal with selection by using non-recipients as the censored group.

Independent variables

This analysis accounts for demographic characteristics, employment status, social security contribution, and coverage of the respondent or spouse. It also includes respondents' health status' measures, as well as family characteristics. The family characteristics variables include co-residence with at least one child, and if there is a child residing abroad.

⁵ Respondents were asked the amount transferred and how often. They reported an amount and the frequency options available to them were weekly, monthly, yearly or once. If they chose to report weekly or monthly it was assumed that transfers occurred on a frequent basis and infrequent otherwise. If respondents' report of frequency is random, then no difference whatsoever should be observed between one group and the other. The assumption here is that individuals report the frequency that best described how often they received transfers.

MHAS does not provide information about children's income. Therefore, I measure children's socioeconomic status was by averaging the years of education of all children of the respondent or the spouse. I also account for the employment status of co-resident and non-co-resident children with an indicator on having at least one employed child. The employment status variable is split according to children's co-residence status since employment may differentially affect children's decision of providing money or time depending on whether they live with their parents or not. Another measure of a child's socioeconomic status is the respondent's perception of each child's financial situation. Respondents ranked children's financial situation using a 1 to 5 scale (excellent to poor). I averaged the ranking across all children. Other covariates accounting for children's characteristics are marital status, for which I used an indicator of having at least one child who is married, the average number of children of each adult child, and whether at least one child lives in the United States. It would be reasonable to split these variables by co-residence status. However, the high correlation between the two groups would have prevented obtaining any relevant conclusions from the regression analysis.

The fact that this analysis is at the respondent level required the aggregate measures about children described above. This, however, might justly raise concerns about how well the analysis captures the role of individual characteristics of children on the likelihood that an older adult receives transfers and the amount received. I address this concern by providing estimates that include variables for the first and second born child.

The regression analysis accounts for income of the selected respondent and spouse – if present – because not all income sources measured in MHAS⁶ were accounted for individually and, more importantly, because the transfer questions in MHAS refer to transfers given to the respondent or the spouse, hence, variation of transfers may be sensitive to changes in income of respondent and/or spouse. Even though MHAS considers financial or in-kind transfers as part of income, the independent variable

⁶ This includes salary, bonuses, pensions and public transfers of the respondent and the spouse separately, as well as asset, property and business revenue of both respondent and spouse.

included in this analysis only refers to non-transfer income, which is split in quintiles to assess differences over the income distribution.

Other authors have pointed out that the analysis of transfer motives requires taking into consideration how income enters the analysis (Kazianga 2006) since motives may respond differently to income or wealth (Cox and Rank 1992). I account for other earnings through indicator variables encoding if a respondent or spouse is employed, if they receive a pension, or if own a business. As a robustness check, the final specification in this chapter also includes the natural logarithm of net worth.

The respondent's perception of reliability⁷ of transfers is measured using an indicator variable that equals one if the respondent indicated counting on the financial or in-kind support of at least one child. Regarding respondent's expectations about reciprocating their children's current support⁸, I include an indicator variable that shows whether parents perceive they will have to reciprocate to at least one of their transfer-providing children. Since perceived reliability and need for repayment might be endogenous, the regression analysis shows results with and without these covariates.

b. Estimation strategies

This chapter presents means comparisons between transfer recipients, non-recipients, and between frequent and infrequent recipients. The results reported here focus on the later as the former has already been discussed.

The assessment of the likelihood that a respondent or spouse receive upstream uses a logistic model on the binary outcome, whereas the likelihood of receiving frequent and infrequent transfers uses a multinomial probabilistic model in which not receiving transfers are the reference group. This classification does not fit an ordered probabilistic specification, so a results show estimates from a multinomial model.

⁷ The MHAS question was: Do you consider this help as income you can count on in the future?

⁸ The MHAS question was: Do you believe that you will have to reciprocate this help in some form in the future?

Equation (1) shows the general form of the probabilistic model in which $P(T_{ik}>0)$ is the probability function showing that the event (i.e. receiving transfers) is observed when the amount of transfers is greater than zero. Here, i represents the respondent, k refers to any the three levels of comparison. In other words, it refers to a respondent or spouse who receives transfers, receives frequent transfers or receives transfers infrequently. Each of these levels compares to those not receiving transfers.

$$(1) P(T_{ik} > 0) = F(\beta_0 + \beta' X + U)$$

In equation (1) the income variable is implicit in vector X . Several authors (Kazianga, 2006; Cox, Hansen and Jimenez, 2004) have shown that the response of transfers to income differs at various levels of the income distribution. Therefore, income enters the function varying within income quintiles, as it is shown in equation (2)

$$(2) P(T_{ik} > 0) = F(\beta_0 + \beta' X + \sum_{q=1}^5 \delta_q I_{qi} + U)$$

In equation (2), I_{qi} represents income in quintile q , of respondent i . It results from $I_{qi} = I_i \cdot I(I_q > 0)$, where I_i is the income of individual i , and $I(I_q > 0)$ is an indicator variable function that equals 1 when income at quintile q is greater than zero. Unlike Cox, Hansen and Jimenez (2004), and following Kazianga (2006), this form of spline regression has predetermined cut points given by income quintiles.

For the estimation of the transfer amount, the benchmark estimator is ordinary least squares. OLS estimates are presented for all transfer amounts (T) as well as for frequent and infrequent transfers. Since the transfer data is censored (i.e. we observe no transfer amount for non-recipients) and since OLS yields inconsistent estimates on a censored sample, I provide estimates from a Tobit model. The standard specification for the Tobit model is as follows:

$$(3) \begin{aligned} T_i^* &= X_i' \beta + e_i \\ T_i &= \max(0, t_i^*) \end{aligned}$$

Where T^* is a latent variable which we can observe only when it is greater than zero. The observed variable is given by T . Here, the log likelihood function is given by:

$$(4) \quad \ln L = \sum_0 \ln \left[1 - \Phi \left(\frac{X_i' \beta}{\sigma} \right) \right] + \sum_+ \ln \left[\frac{1}{\sigma} \varphi \left(\frac{t_i - X_i' \beta}{\sigma} \right) \right]$$

The first part of equation (4) is Tobit's correction for the censored transfers (this is represented by the "0" subscript of the first sum), while the second part corresponds to the uncensored sample (shown by the "+" subscript) (Wodajo 2008). Also, $\Phi()$ and $\varphi()$ are the cumulative and probability density functions, respectively, of the normal distribution. Most of the research on family transfers relies on Tobit estimates. This model imposes the assumption that there is no distinction between the latent process of the choice of giving a transfer and the latent process that determines the amount given. It is probable that this assumption is unrealistic. For instance, children who respond to parents' needs might decide they will assist regardless of how much they are willing to give at a particular moment. However, it is also possible that the amount transferred is a function of unobserved characteristics that are mainly related to the decision to transfer which would yield biased estimates. I address this by providing estimates of a Heckman selection model, which has the following standard specification

$$(5) \quad \begin{aligned} &\text{Latent decision function : } d_i^* = X_1' \beta_1 + u_i \\ &\text{Observed decision : } d = 1 \text{ if } d^* > 0; d = 0 \text{ otherwise} \end{aligned}$$

The amount of transfers in turn, is driven by a separate latent variable, T^* :

$$(6) \quad \begin{aligned} &\text{Latent transfer amount : } T_i^* = X_2' \beta_2 + e_i \\ &\text{Observed transfer amount : } T_i = \begin{cases} t_i^* & \text{if } d = 1 \\ 0 & \text{if } d = 0 \end{cases} \end{aligned}$$

Unlike Tobit, the selection model assumes there is a correlation between u_i and e_i (the error of the decision and amount latent functions). Heckman's two-step estimator

procedure treats this problem as an omitted variable bias issue, so the solution requires controlling in T^* for the unobserved variation in d^* affecting the amount in T , given a set of covariates X . Heckman defines such variable, also known as the inverse Mills ratio⁹ (IMR). In the absence of a valid instrument, identification in this analysis is given by the non-linearity of the IMR.

Both Heckman and Tobit estimates assume that unobservable variables (such as the degree of altruism of the donor) enter the regression in a separable form. To account for this, I also provide estimates of the transfer derivative with respect to the income of recipients (parents) using the Altonji-Ichimura (1996) (AI) estimator. In short, the AI estimator provides an estimator of the expected transfer derivative for the self selected sample assuming that the unobserved preferences and the transfer function relate in a non-separable way. The AI estimator takes as starting point a transfer function $T(X, \varepsilon)$, where X is the vector of covariates, which includes income, Y . The unobserved characteristics, given by ε , account for unobserved preferences. The AI estimator assumes that if individuals are altruistic then the transfer derivative restriction will hold for all values of $\varepsilon(X)$ in which $T > 0$ (Altonji, Hayashi et al. 1997). In light of this, the conditional expected function is as shown in equation (7).

$$(7) \bar{T}(X) = E[T(X, \varepsilon) | X, T > 0] = \int_{\varepsilon(X)} T(X, \varepsilon) \frac{g(\varepsilon)d\varepsilon}{P(X)}$$

Where $g(\varepsilon)$ refers to the distribution of the unobserved preferences. The authors show that the derivative of the expected transfer function with respect to income of j (i.e. parent or child) can be obtained as a function of observed parameters. Their result is shown in equation (8).

$$(8) E \left[\frac{\partial T(X, \varepsilon_i)}{\partial Y_j} \Big| X, T > 0 \right] = \frac{\partial \bar{T}(X, \varepsilon_i)}{\partial Y_j} + \frac{\partial P(T(X, \varepsilon_i) > 0 | X)}{\partial Y_j} \cdot \frac{\bar{T}(X, \varepsilon_i)}{P(T > 0)}$$

⁹ This non linearity is given by the fact that the IMR is built by dividing the probability density function by the cumulative density function of the probability of transfers taking place.

Here, $\partial \bar{T}(X, \varepsilon_i) / \partial Y_j$ is the derivative of the estimated transfer function with respect to income. Insofar as I have no information about the child's income, the derivative is estimated only for the parent. $\partial P(T(X, \varepsilon_i) > 0 | X) / \partial Y_j$ is the marginal effect of income on the probability of $T > 0$. Finally, $\bar{T}(X, \varepsilon_i) / P(T > 0)$ shows the ratio of the estimated transfer function evaluated at sample means, relative to the probability of $T > 0$, also evaluated at the sample means. Standard errors and significance tests are estimated through bootstrapping.

1.4. Results

a. Descriptive results

Table 1.2 shows the prevalence of upstream transfers in 2001 and in 2003 indicating that, if in 2001 a person is in a category (receiving or not) that person is likely to remain in that category (70.8 percent of non recipients in 2001 stayed non recipients, and 62.6 percent of recipients stayed recipients). Only 37 percent of those who received transfers in 2001 did not in 2003, and only 29 percent of non recipients in 2001 became recipients in 2003.

Table 1.2 - Number and percentage of individuals who claimed to have received transfers in 2001 and in 2003

	Did not receive in 2003	Received in 2003	Total
Did not receive in 2001	2,754 70.8%	1,133 29.2%	3,887 100%
Received in 2001	1,643 37.4%	2,744 62.6%	4,387 100%
Total	4,397 53.1%	3,877 46.9%	8,274 100%

Data: MHAS 2001, 2003

The results from Table 1. 3 are consistent with previous research using MHAS. In short, the comparison between recipients and non-recipients shows that women are the largest group of recipients, and that recipients of family transfers are on average, older than non-

recipients, are unmarried, and live in non-urban areas. Furthermore, respondents who receive transfers are mostly non-employed individuals (46.1 percent of respondents or their spouses are employed, compared to 71.9 percent of non-recipients) and tend to have less years of schooling. Results also show that transfer recipients have more children (6, compared to 4.7 among non recipients) and are more likely to have a married child (93.3 percent compared to 78.5 percent), a child who is employed (56.4 percent, compared to 48.4 percent), and a child that lives in the United States (29.3 percent compared to 15.3 percent).

Table 1.3 also splits the sample among recipients of frequent transfers, recipients of infrequent transfers, and those who have never received transfers. Results show that women are more likely to receive frequent transfers while married couples are more likely to receive infrequent transfers (59.6 percent) than frequent transfers (51.6 percent). Recipients of infrequent transfers are more likely to have at least one child living in the United States (42.2 percent of infrequent and 27 percent of frequent recipients), while recipients of frequent transfers are more likely to have at least one co-resident employed child (60.4 percent of frequent and 50.9 percent of infrequent recipients). The non-co-resident group includes respondents with children living in the United States, which may explain why they are more prevalent in the infrequent transfers group.

Recipients of frequent transfers are less likely to be employed than infrequent recipients (43.7 and 55.7 percent, respectively). In contrast, recipient of infrequent transfers are more likely to have a business (32.3 percent) than those recipients receiving frequent transfers (21.5 percent).

Table 1. 3 - Means and joint significance among recipients of financial or in kind transfers by frequency and non recipients in 2001.

	All recipients	Frequent	Infrequent	Does not receive	Difference	
					Receives-does not receive	Frequent-infrequent
Respondent is female	62.2%	64.6%	58.6%	43.7%	18.5% ***	6.0% **
Married, cohabits	51.6%	51.6%	59.6%	68.9%	-17.3% ***	-8.0% ***
Resides in mostly urban area	62.2%	64.5%	63.4%	71.8%	-9.6% ***	1.1%
Age						
Under 55	19.5%	21.3%	20.3%	36.5%	-17.0% ***	0.9%
55 to 59	18.3%	19.3%	19.9%	21.6%	-3.3% ***	-0.6%
60 to 64	16.2%	16.5%	17.9%	14.5%	1.7% **	-1.4%
65 to 69	15.0%	14.3%	16.0%	10.8%	4.2% ***	-1.7%
70 to 74	11.6%	11.6%	11.0%	7.2%	4.5% ***	0.6%
75 to 79	9.1%	9.0%	6.7%	4.5%	4.7% ***	2.4% *
80 and older	9.0%	6.9%	6.7%	3.4%	5.7% ***	0.2%
Education						
0 years of schooling	30.8%	29.5%	26.2%	18.7%	12.1% ***	3.3% *
1-3 years of schooling	29.7%	28.9%	31.3%	22.7%	7.1% ***	-2.4%
4-6 years of schooling	25.2%	26.8%	25.4%	25.6%	-0.4%	1.4%
7-9 years of schooling	8.9%	9.8%	10.2%	15.6%	-6.6% ***	-0.3%
10-12 years of schooling	1.6%	2.0%	1.6%	4.8%	-3.2% ***	0.4%
More than 12 years	2.2%	1.9%	3.9%	11.0%	-8.8% ***	-2.0% **
Health						
Number of chronic illnesses diagnosed	0.984	0.991	0.964	0.751	0.232 ***	0.0
Self rated health as excellent, very good, or good	26.8%	29.4%	27.3%	41.1%	-14.4% ***	2.1%
Family						
Average age of all children	29.2	29.0	28.8	24.9	4.3 ***	0.2
Average age of co-resident children	19.4	19.5	19.3	17.9	1.5 ***	0.2
Average age of no co-resident children	35.8	35.3	34.5	32.0	3.8 ***	0.8 **

	All recipients	Frequent	Infrequent	Does not receive	Difference	
					Receives-does not receive	Frequent-infrequent
Number of children	6.0	6.0	6.2	4.7	1.3 ***	-0.2
Co-resides with at least one child	71.4%	72.4%	68.8%	74.7%	-3.3% ***	3.7% *
At least one child lives in the United States	29.3%	27.0%	42.2%	15.3%	13.9% ***	-15.2% ***
Average number of years of schooling of children	8.6	8.8	9.0	9.8	-1.2 ***	-0.2
At least one child is married	93.3%	92.3%	93.8%	78.5%	14.8% ***	-1.4%
At least one co-resident child employed	56.4%	60.4%	50.9%	48.4%	8.0% ***	9.5% ***
At least one non-co-resident child employed	88.9%	88.6%	93.2%	71.9%	17.0% ***	-4.5% ***
Average number of children per child	2.1	2.0	1.9	1.4	0.7 ***	0.1
Respondent's rating of child's financial situation (higher score indicates poorer rating)	3.4	3.4	3.5	3.4	0.0	0.0
Labor and income						
Respondent or spouse are employed	46.1%	43.7%	55.7%	71.9%	-25.7% ***	-12.0% ***
R or S have health insurance (public/ private)	62.4%	65.3%	63.4%	65.7%	-3.4% ***	2.0%
Respondent or spouse receive pension	21.8%	22.2%	22.7%	24.5%	-2.6% **	-0.5%
Respondent or spouse own a business	24.5%	21.5%	32.3%	30.4%	-5.9% ***	-10.7% ***
Net worth						
Non-transfer income - quintile 1	0	0	0	0	0.0	0.0
Non-transfer income - quintile 2	1,180.8	1,068.6	1,039.7	797.9	382.9 ***	28.9
Non-transfer income - quintile 3	4,186.9	4,175.8	4,678.8	3,857.0	329.9 *	-502.9
Non-transfer income - quintile 4	7,836.5	7,931.4	9,254.4	13,041.5	-5,205.0 ***	-1,323
Non-transfer income - quintile 5	26,962.9	26,993.9	32,276.9	167,375.6	-140,412.7 ***	-5,283
Observations	4,837	2,288	688	4358		

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: MHAS 2001

b. Regression results

This section first shows results about the determinants of upstream transfers, followed by results about transfer motives. Even though the regression tables report the OLS, Heckman and Tobit estimates, results are reported on Tobit as it is the preferred estimator because it takes into account data censoring¹⁰.

Demographic characteristics of the respondent

The probabilistic regressions in Table 1.4 show that women are more likely than men to receive transfers and that this is also the case for frequent and for infrequent transfers. The coefficient from the Tobit estimate, on the other hand, is also positive and statistically significant for women only in the frequent transfer group. Marital status is not statistically significant (at a $p < 0.05$ cutoff) in any regression, a result consistent with previous findings. Living in an urban area is associated to a lower likelihood of receiving transfers but a positive sign with respect to the total amount (Table 1.5) and to infrequent transfers (Table 1.6) but not frequent transfers.

Age variables show that older adults are more likely to receive infrequent transfers but age is not associated to receiving frequent transfers. Results on the amount of transfers are less conclusive in 2001. However, data from 2003 shows age is not associated to the amount of transfers received. The education variables show that higher education is related to a lower probability of receiving transfers, receiving frequent transfers, but not infrequent transfers. Furthermore, Table 1.4 shows that this negative relationship is statistically significant among older adults with seven or more years of education. The coefficients of schooling for the amount of transfers show that education has no association with the amount of frequent transfers, but results are less clear about infrequent and total transfers. To address this, estimates in Appendix I (Table 1.12 to Table 1.14) show the same regressions using data of MHAS 2003, which did not left censor respondents who received less than \$5000 pesos. The coefficients on these tables show no association between the amount of transfers and schooling. Finally, the estimates

¹⁰ Even though self selection is a concern, Heckman estimates are not preferred since the selection coefficient was not statistically significant for all regressions in 2003.

using MHAS 2001 show that having a higher number of chronic illnesses is associated with a higher likelihood of receiving frequent transfers, as well as a higher amount of frequent transfers. This result, however, does not hold in the 2003 specifications. Self-rated good health, on the other hand, is also associated to a higher likelihood and higher amount of frequent transfers and the result holds in both the 2001 and 2003 regressions.

Table 1.4 – Logistic Regression on the likelihood of receiving transfers, and Multinomial Logistic regression results on the likelihood of receiving frequent or infrequent transfers

	All transfers		Frequent		Infrequent	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.308	.0551***	0.356	.0677***	0.359	.0973***
Married, cohabits	-0.0892	0.0583	-0.0568	0.0696	0.0201	0.101
Resides in mostly urban area	-0.148	.0576*	-0.151	.0699*	0.0301	0.104
Age						
Under 55						
55 to 59	0.119	0.0713	0.0618	0.088	0.187	0.134
60 to 64	0.164	.0821*	0.0809	0.101	0.334	.149*
65 to 69	0.212	.0915*	0.077	0.112	0.401	.166*
70 to 74	0.237	.108*	0.106	0.129	0.433	.192*
75 to 79	0.356	.123**	0.279	0.148	0.381	0.231
80 and older	0.535	.148***	0.149	0.178	0.679	.259**
Education						
0 years of schooling						
1-3 years of schooling	-0.0426	0.0683	-0.0567	0.082	0.0889	0.12
4-6 years of schooling	-0.11	0.0734	-0.0677	0.0882	-0.0417	0.134
7-9 years of schooling	-0.316	.0978**	-0.287	.12*	-0.197	0.186
10-12 years of schooling	-0.57	.163***	-0.414	.202*	-0.589	0.354
More than 12 years	-0.83	.14***	-1.04	.193***	-0.349	0.263
Health						
Number of chronic illnesses diagnosed	0.078	.0275**	0.0876	.033**	0.0725	0.0494
Self rated health as excellent, very good, or good	-0.151	.0549**	-0.0338	0.0667	-0.212	.101*
Family						
Number of children	0.0627	.0101***	0.0729	.0118***	0.0669	.0173***
Average age of children	0.00686	.0032*	0.0106	.00401**	0.00447	0.00564
Co-resides with at least one child	-0.254	.0756***	-0.47	.0965***	-0.268	0.139
At least one child lives in the United States	0.563	.062***	0.467	.074***	1.09	.0959***
Average number of years of schooling of children	0.0198	.00869*	0.0211	.0107*	0.0269	0.0168
At least one child is married	0.16	0.094	0.0158	0.121	0.0759	0.189
At least one co-resident child employed	0.526	.0636***	0.758	.0823***	0.306	.12*
At least one non co-resident child employed	0.364	.0809***	0.385	.105***	0.814	.179***

	All transfers		Frequent		Infrequent	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Average number of children per child	0.0393	0.0245	-0.0115	0.0298	-0.0402	0.0464
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.0488	0.0362	-0.0786	0.0445	-0.0319	0.0699
Respondent or spouse employed	-0.45	.0681***	-0.581	.0828***	-0.373	.112***
Respondent or spouse have health insurance (public or private)	0.228	.0584***	0.292	.071***	0.221	.106*
Respondent or spouse receive pension	-0.379	.0764***	-0.449	.0948***	-0.486	.135***
Respondent or spouse own a business	0.0164	0.0602	-0.0714	0.0757	0.24	.105*
Non-transfer income - quintile 2	-0.0203	.0101*	-0.0339	.0119**	-0.0139	0.0176
Non-transfer income - quintile 3	-0.0338	.00864***	-0.0381	.0103***	-0.00194	0.0144
Non-transfer income - quintile 4	-0.062	.00814***	-0.065	.00973***	-0.0336	.014*
Non-transfer income - quintile 5	-0.0808	.00787***	-0.0913	.00974***	-0.0457	.0132***
Constant	-0.543	.201**	-1.00	.243***	-3.44	.405***
Observations	8870		7702			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$
Data: MHAS 2001

Family characteristics

Regarding children and family characteristics, both having more children and having older children had positive signs in both the likelihood and amount of frequent transfers using 2001 data, and also on infrequent transfers using 2003 data.

Co-residence has no association with the likelihood of transfers, but is associated to lower amount of frequent transfers. On the other hand, having a child living abroad is associated to higher likelihood of receiving frequent and infrequent transfers, as well as higher amount of infrequent transfers.

With the exception of respondent's rating of children's financial status, all other measures of children's socioeconomic status are associated to higher likelihood of all, frequent and infrequent transfers, a result consistent with both altruism and exchange frameworks. Since children's variables of SES are aggregates at the respondent level, Table 1.11 shows covariates for individual children with results similar to the ones from

Table 1.4. Regarding the amount of transfers, Table 1.5 and Table 1.6 show that having at least one employed co-resident child had a positive association with the amount of frequent transfers, but not infrequent transfers. In contrast, having at least one non co-resident child who is employed increases the amount of infrequent transfers.

Employment and income

The variables related to employment status of the respondent or spouse (i.e.. at least one of them was employed), as well as the measures of income, had a negative association with both the likelihood and amount of transfers. The employment status variable is also negative and statistically significant for the likelihood of infrequent transfers, but not the amount. The results from estimates using 2001 and 2003 data show limited evidence that having health insurance and receiving pensions are associated to the amount of transfers. Having a business is only associated to a higher likelihood of infrequent transfers, consistent with the descriptive results shown above.

The coefficients of income variables on the probability of receiving transfers shows that higher respondent income is associated to a lower likelihood of receiving transfers, regardless of frequency, as well as a lower likelihood of receiving frequent financial or in-kind transfers. These results held across all levels of the income distribution and are consistent with the conceptual framework of altruistic and exchange motives. Regarding infrequent transfers, the income coefficients have a negative sign, but this is only significant for the two highest income quintiles.

The coefficients of the income variables, shown in Table 1.5 and Table 1.6 using 2001 data, and in Table 1.12 to Table 1.14 using 2003 data, show that, for all transfers, income has a negative association to transfers. The results for all transfers in 2001, however, show no statistical significance. Results for 2003, however, show negative and statistically significant coefficients over the income distribution.

Regressions on frequent and infrequent transfers show more consistent results. For estimates of frequent transfers in 2001 and in 2003, higher income is associated to a

lower amount of transfers, whereas for infrequent transfers the coefficients are positive and statistically significant or zero. In short, these results show that frequent transfers may either be driven by the altruistic motive or children have an elastic demand for services from their parents. Results for infrequent transfers, on the other hand, are consistent with the predictions of the exchange motive framework.

Table 1.7 shows the estimates from the Altonji-Ichimura estimator for all, frequent and infrequent transfers, using 2001 and 2003 data. Results are consistent with the findings above since the amount of transfers has a negative association with higher income for frequent transfers, but not for infrequent transfers.

Table 1.8 shows the A-I estimator for different levels of income. Again, results show that frequent transfers have a negative association to higher income, and that results for infrequent transfers are consistent with the predictions of the exchange framework.

Table 1.5 - OLS, Heckman and Tobit regressions on the conditional amount of transfers received in 2001

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.078	0.057	0.050	0.0636	0.713	.257**
Married, cohabits	0.179	.059**	0.182	.0581**	0.665	.261*
Resides in mostly urban area	0.177	.0532***	0.184	.0559**	0.554	.248*
Age						
Under 55	<i>Reference</i>					
55 to 59	-0.027	0.0695	-0.034	0.0742	-0.204	0.326
60 to 64	-0.079	0.0791	-0.091	0.0821	-0.379	0.361
65 to 69	-0.153	0.0891	-0.166	0.0901	-0.848	.399*
70 to 74	-0.197	0.107	-0.212	.103*	-0.631	0.455
75 to 79	-0.167	0.122	-0.189	0.119	-0.892	0.527
80 and older	-0.421	.135**	-0.442	.137**	-2.320	.604***
Education						
0 years of schooling	<i>Reference</i>					
1-3 years of schooling	0.105	0.0623	0.106	0.0619	0.261	0.277
4-6 years of schooling	0.184	.0659**	0.188	.068**	0.420	0.305
7-9 years of schooling	0.263	.1**	0.282	.0998**	0.649	0.437
10-12 years of schooling	0.562	.203**	0.601	.187**	1.160	0.803
More than 12 years	0.167	0.158	0.233	0.179	0.301	0.757
Health						

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Number of chronic illnesses diagnosed	0.043	0.0252	0.037	0.0258	0.103	0.112
Self rated health as excellent, very good, or good	0.066	0.0562	0.071	0.0545	0.999	.241***
Family						
Number of children	0.049	.00948***	0.044	.0106***	0.118	.0424**
Average age of children	0.012	.00316***	0.011	.00314***	0.026	0.0139
Co-resides with at least one child	-0.247	.083**	-0.215	.0873*	-1.680	.362***
At least one child lives in the United States	0.265	.0568***	0.220	.0685**	0.846	.24***
Average number of years of schooling of children	0.034	.00856***	0.033	.00875***	0.064	0.0384
At least one child is married	-0.152	0.106	-0.157	0.104	-1.100	.449*
At least one co-resident child employed	0.253	.0709***	0.203	.0863*	1.260	.319***
At least one non co-resident child employed	0.031	0.0912	-0.008	0.0982	1.060	.397**
Average number of children per child	-0.048	0.0246	-0.047	0.0242	-0.456	.109***
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.157	.038***	-0.153	.0373***	-0.290	0.165
Respondent or spouse work	-0.205	.0683**	-0.165	.0773*	-0.738	.300*
Respondent or spouse have health insurance (public or private)	0.013	0.0552	-0.005	0.0584	0.307	0.25
Respondent or spouse receive pension	-0.078	0.0746	-0.047	0.0805	-0.328	0.335
Respondent or spouse own a business	-0.040	0.0628	-0.043	0.0629	-0.021	0.28
Non-transfer income - quintile 2	-0.018	.00927*	-0.016	0.00943	-0.093	.0419*
Non-transfer income - quintile 3	-0.016	0.00879	-0.015	0.00869	-0.024	0.0379
Non-transfer income - quintile 4	-0.010	0.00889	-0.005	0.00949	-0.003	0.0383
Non-transfer income - quintile 5	-0.009	0.0091	-0.003	0.0104	-0.015	0.0383
Constant	9.1	.201***	9.34	.317***	4.12	.933***
Observations	4723		7174		3027	
Uncensored observations	3027		3027			
Chi sq. P-value of the LR test of independence			0.4495			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: MHAS 2001

Table 1.6 – Heckman and Tobit regressions on the conditional amount of transfers received frequently and infrequently in 2001

	FREQUENT				INFREQUENT			
	Heckman		Tobit		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.286	.0708***	0.656	0.365	-0.041	0.119	0.490	0.713
Married, cohabits	0.100	0.0713	0.539	0.371	0.202	0.107	0.855	0.75
Resides in mostly urban area	0.042	0.0696	-0.0424	0.351	0.241	.101*	1.850	.733*
Age								
Under 55	<i>Reference</i>							
55 to 59	0.002	0.0901	-0.388	0.472	-0.061	0.136	0.430	0.991
60 to 64	0.073	0.101	-0.902	0.524	-0.362	.153*	1.170	1.08
65 to 69	-0.034	0.112	-1.63	.578**	-0.362	.17*	1.410	1.18
70 to 74	-0.045	0.128	-1.3	.649*	-0.626	.197**	1.100	1.36
75 to 79	0.081	0.146	-1.26	0.737	-0.498	.232*	-0.015	1.6
80 and older	-0.224	0.171	-3.44	.844***	-0.562	.269*	0.966	1.74
Education								
0 years of schooling	<i>Reference</i>							
1-3 years of schooling	0.036	0.0788	-0.069	0.392	0.190	0.114	1.090	0.809
4-6 years of schooling	0.088	0.0858	0.255	0.433	0.375	.126**	0.648	0.912
7-9 years of schooling	0.009	0.122	0.368	0.635	0.614	.177***	1.530	1.32
10-12 years of schooling	0.225	0.212	1.53	1.15	0.794	.358*	1.020	2.63
More than 12 years	-0.542	.212*	-2.25	1.19	0.704	.256**	4.760	2.00*
Health								
Number of chronic illnesses diagnosed	0.086	.032**	0.149	0.16	0.044	0.0458	0.022	0.331
Self rated health as excellent, very good, or good	0.058	0.0667	1.3	.348***	-0.023	0.107	-0.392	0.737
Family								
Number of children	0.089	.012***	0.151	.0607*	0.026	0.019	0.074	0.125
Average age of children	0.017	.00385***	0.0384	.0192*	0.011	0.00631	-0.019	0.0385
Co-resides with at least one child	-0.502	.103***	-2.13	.527***	0.001	0.138	-0.537	0.988
At least one child lives in the United States	0.668	.0705***	-0.635	0.354	-0.125	0.185	4.600	.661***

	FREQUENT				INFREQUENT			
	Heckman		Tobit		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Average number of years of schooling of children	0.042	.0108***	0.0272	0.0546	0.024	0.0163	0.058	0.117
At least one child is married	-0.098	0.12	-1.52	.641*	-0.083	0.207	-0.572	1.39
At least one co-resident child employed	0.635	.0912***	2.11	.465***	0.154	0.123	-1.460	0.879
At least one non co-resident child employed	0.250	.104*	0.458	0.55	-0.083	0.227	3.480	1.23**
Average number of children per child	-0.055	0.0301	-0.435	.152**	-0.059	0.0479	-0.595	0.314
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.160	.0462***	-0.422	0.235	-0.126	0.0697	-0.082	0.488
Respondent or spouse work	-0.508	.083***	-1.06	.43*	-0.235	0.14	0.480	0.826
Respondent or spouse have health insurance (public or private)	0.202	.0708**	0.53	0.36	-0.301	.107**	-0.208	0.746
Respondent or spouse receive pension	-0.397	.0927***	-0.291	0.483	0.272	0.159	-0.892	0.955
Respondent or spouse own a business	-0.053	0.0777	-0.864	.408*	0.002	0.117	1.750	.766*
Non-transfer income - quintile 2	-0.030	.0116*	-0.124	.0584*	-0.014	0.0183	0.079	0.122
Non-transfer income - quintile 3	-0.022	.0104*	-0.0803	0.0537	-0.015	0.0161	0.256	.106*
Non-transfer income - quintile 4	-0.026	.0104*	-0.0494	0.0543	0.000	0.0168	0.224	.106*
Non-transfer income - quintile 5	-0.053	.0106***	-0.128	.0562*	0.020	0.0171	0.339	.104**
Constant	7.38	.267***	3.37	1.31*	9.72	.857***	-21.6	2.89***
Observations	6390		2243		4821		674	
Uncensored observations	2243				674			
Chi sq. P-value of the LR test of independence	0.000				0.2984			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: MHAS 2001

Table 1.7 – Altonji-Ichimura estimator of the transfer derivative with respect to income of the transfer recipient in 2001 and in 2003

		Coefficient	SE
All	2001	-0.0162	0.0075**
	2003	-0.033	0.007***
Frequent	2001	-0.0042	0.0081
	2003	-0.023	0.006***
Infrequent	2001	-0.0144	0.0140
	2003	0.024	0.016

*Level of significance: * p<0.1; ** p<0.05; ***p<0.001*

Data: MHAS 2001, 2003

Bootstrapped SE with 300 repetitions

Note: the independent variables in AI are being female, married, live in urban area, age, schooling, number of limitations with activities of daily living, number of chronic illnesses, number of children, having at least one child living in the United States, co-resident and non co-resident children years of education, marital status, work status, number of children, age, parent rating of financial situation, frequency of communication with non co-resident child, having at least one non co-resident child in the same neighborhood, selected respondent work status, social security coverage, receiving pension, business ownership and income.

Table 1.8 - Altonji-Ichimura estimator of the transfer derivative with respect to income of the transfer recipient over the income distribution in 2003

	All transfers	Frequent transfers	Infrequent transfers
Quintile 2	-0.0795 (0.034) **	-0.0195 (0.047)	0.1153 (0.106)
Quintile 3	-0.1119 (0.032) ***	-0.0900 (0.043) **	0.1492 (0.101)
Quintile 4	-0.2091 (0.030) ***	-0.1712 (0.041) ***	0.0840 (0.098)
Quintile 5	-0.2594 (0.028) ***	-0.3613 (0.043) ***	-0.1188 (0.091)
n	500 repetitions	500 repetitions	500 repetitions

*Level of significance: * p<0.1; ** p<0.05; ***p<0.001*

Data: MHAS 2003

It is possible that cross-sectional results do not account for time-varying unobservable variables. Previous research (Alaimo 2007) has addressed this using fixed effects estimates. Even though this addresses part of the issue, the censoring of one third of the amount of transfer recipients implies that the fixed effects estimates must exclude these respondents. I estimate a random effects Tobit model on all, frequent and infrequent transfers as final robustness check. Results are displayed on Table 1.18, Table 1.19 and

Table 1.20 in this chapter's appendix. The estimates show that, for the top 50 percent of the income distribution, infrequent transfers raise with income, whereas for the bottom 50 percent transfers do not change with income. Results for frequent transfers, on the other hand, show that these decrease with income among the top 50 percent, and remain unchanged for the bottom 50 percent. In short, results about frequent and infrequent transfers for the top 50 percent of the income distribution are consistent with the findings from the estimates shown above. For the bottom 50 percent, results are consistent with regards to infrequent transfers. The results about frequent transfers, on the other hand, are only consistent with the AI estimator.

Rely and Repay

One of the unique features of MHAS is that it explicitly asks parents whether they expect to pay back the transfers they receive and whether they think they can count on the upstream transfer as a source of future income. An immediate concern with these variables is they may be endogenous to the transfer decision. The results shown here do not include them as covariates in order to provide more conservative estimates. However, I replicated the results shown here including perception about pay back and reliance as covariates and found no change on any of the results above.

Table 1.15 and Table 1.16 show Tobit estimates for 2001 and 2003, respectively, of all, frequent, and infrequent transfers. Both the perception of having to repay and counting on help in the future, were associated to larger transfer amounts. The interaction between these covariates, however, shows that counting on children's help in the future and perceiving they must repay is associated to a lower amount of transfers. Another set of interactions is shown in Table 1.21. This table shows the coefficients of the interaction between counting on children's help (i.e. reliability) and income over the income distribution on a regression on the natural log of infrequent transfers as well as frequent transfers. This table shows that the coefficients on income remain consistent with the results shown above and that, for all income levels, higher income among those who rely on their children's help is associated to higher frequent and infrequent transfers. While a analysis of the causal relationship between transfers and these covariates remains outside

the scope of this chapter, these results indicate perception of reliability as an indicator of child's involvement in parent's old age income security.

1.5. Discussion

The results presented here both confirm prior studies and shed new light on the determinants of the amount of frequent and infrequent transfers to older adults in Mexico. Overall, this chapter's assessment of transfer determinants echoes the findings of previous work (Wong and Espinoza 2005; Alaimo 2007) using MHAS: women and older adults with more children are more likely to be recipients of financial or in-kind support, whereas being married, having more years of education, being employed or having a spouse who is employed, are associated to a lower likelihood of receiving financial or in-kind transfers. The findings regarding the determinants of the likelihood of transfers also mirror findings from other countries that show that transfers are more likely to come from children with better socioeconomic status. The results in this paper also show the relevance of emigration on Mexican families' financial well-being since older adults with children living in the United States were more likely to receive upstream transfers of money.

Unlike previous research, this chapter shows the determinants on the amount of transfers received by adults 50 and older, and distinguishes between frequent and infrequent transfers. A couple of results stand out with respect to previous research. First, having a child living in the United States is associated to larger amounts of infrequent transfers and to smaller amounts of frequent transfers. The patterns observed are consistent with prior research indicating that, when children live abroad, they are the providers of financial resources for their parents, whereas children who stay provide other forms of transfers (Antman 2007). International transaction costs may also contribute to the pattern of larger and less frequent transfers. Second, having more children is associated to receiving larger transfers, and this applies to both frequent and infrequent transfers. If, as Park (2010) hypothesizes, frequent transfers respond to older adults' need for every-day

consumption goods, then Mexican children appear to provide a source of income security. The quality and sustainability of the security provided, however, is an issue open for future research.

This chapter also analyzes results about changes in transfers due to changes in income over the income distribution using the altruism and exchange motives framework. Results show that infrequent transfers align with the predictions of the exchange motive framework. From a policy point of view, this implies that public programs addressing old age income security are not crowding out financial or in-kind transfers that take place due to a life event such as illness or widowhood or are occasional gifts.

Results for frequent transfers, on the other hand, show that the amount of transfers declines when the parent's income increases. This result is consistent with the altruism framework which predicts full displacement or crowding-out of private transfers when recipient's income increases. The result is also consistent with the exchange framework which predicts children give less transfers when parents' income increases if children can easily replace the services they receive from their parents. The distinction of motives is not innocuous since the altruism framework assumes parents are unable to influence their children's decision to reduce the amount of transfers. If this is the case, then older adults are left in a vulnerable position when public programs come into place for a limited period of time insofar as it is uncertain if children will continue providing transfers after the program is gone. Moreover, the impact on future generations' expectations regarding their role in assuring their parents may be shaped by the policies in place when they are young and the transfer behavior they see on the part of their parents with regard to the grandparents.

Information about respondents' perception of whether they have to repay their children's financial or in-kind support and if they believe they can count on it as future income may shed some light about how much say parents have on children's decision. This issue is relevant from a policy point of view since it is possible that the level of influence on

children's decision to transfer also determines labor market decisions of the parents which, in turn, will influence their old age income security.

Limitations to this study include the censoring of the amount of information affected a third of the baseline sample who received transfers. Robustness checks for cross-sectional estimates relied on the follow up wave since it did not the amount of transfers. Another limitation is the lack of information about the child's income. This is relevant for two reasons. First, it makes it impossible to explicitly test the altruism hypothesis using the income derivatives and, second, income from children might be correlated to respondents' SES raising concerns of selection bias.

Balancing these limitations are several strengths. First, I compare results across different estimators for both waves, in addition to estimates over the longitudinal data all of which provided consistent results. Second, the distinction between frequent and infrequent transfers provides evidence that children distinguish between transfers that respond to parents' need (i.e. are driven by altruistic motive) and transfers that occur in exchange for repayment. These results contribute to previous work suggesting multiple motives for family transfers. For instance, Frankenberg and others (2002) show that, in Southeast Asian countries, children and parents exchange money and services, and also that children provide transfers in compensation for their parent's investment in their children's education (Frankenberg, Lillard et al. 2002). Park (2010), on the other hand, shows frequent transfers respond to parent's needs, a result consistent with this chapter's conclusions.

In summary, this chapter has shown that the determinants of frequent transfers are similar to those found by previous work using MHAS (Wong and Espinoza 2005), but that the determinants of infrequent transfers differ in relevant aspects. In particular, this chapter coincides with previous work in showing that children's socioeconomic characteristics are important determinants of frequent transfers. However, results here indicates that having at least one child living in the United States was the most important of children's characteristics in explaining the likelihood and amount of infrequent transfer, a result that

could be associated to the costs of transaction of international remittances, as well as differences in the amount of transfers from migrant children when parents suffer a life shock. Finally, results point out that old age income security policies will not crowd out infrequent transfers, but may do so with frequent transfers. Future research is necessary to determine the extent of such crowd out on low income older adults and how this affects their quality of life.

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Appendix 1.1

Additional regressions on the amount of transfers

Table 1.9 - Logistic Regression on the likelihood of receiving transfers, and Multinomial Logistic regression results on the likelihood of receiving frequent or infrequent transfers using individual children's information

	All transfers		Frequent		Infrequent	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.301	.0579***	0.382	.0708***	0.303	.103**
Married, cohabits	-0.124	.0606*	-0.114	0.0719	0.017	0.105
Resides in mostly urban area	-0.164	.0597**	-0.178	.0723*	0.00716	0.108
Age						
Under 55	<i>Reference</i>					
55 to 59	0.122	0.0729	0.0909	0.0897	0.183	0.138
60 to 64	0.17	0.087	0.117	0.107	0.299	0.157
65 to 69	0.161	0.0995	0.0957	0.122	0.322	0.179
70 to 74	0.173	0.123	0.0878	0.145	0.321	0.213
75 to 79	0.292	.141*	0.3	0.172	0.29	0.262
80 and older	0.433	.176*	0.0743	0.213	0.54	0.297
Education						
0 years of schooling	<i>Reference</i>					
1-3 years of schooling	-0.0327	0.0717	-0.0619	0.086	0.149	0.126
4-6 years of schooling	-0.108	0.0764	-0.0711	0.092	-0.0593	0.141
7-9 years of schooling	-0.331	.102**	-0.339	.125**	-0.131	0.193
10-12 years of schooling	-0.566	.162***	-0.49	.201*	-0.466	0.351
More than 12 years	-0.856	.143***	-1.13	.197***	-0.321	0.266
Health						
Number of chronic illnesses diagnosed	0.0798	.0289**	0.0935	.0343**	0.0796	0.0517
Self rated health as excellent, very good, or good	-0.133	.0573*	-0.041	0.0695	-0.17	0.106
Family						
Number of children	0.064	.0105***	0.0735	.0125***	0.0756	.0182***
Age of oldest child	0.0175	.00456***	0.0161	.00559**	0.0208	.00758**
Oldest child is female	-0.0196	0.0498	0.0191	0.0605	-0.116	0.0905
Oldest child is married	-0.159	.0689*	-0.245	.0837**	-0.0603	0.129
Second child is married	0.0256	0.066	-0.145	0.082	0.0263	0.13
Financial situation of oldest child						
Excellent	0.355	0.298	0.48	0.403	0.498	0.466
Very good	0.169	0.177	0.408	0.215	0.235	0.304
Good	0.148	0.097	0.405	.124**	-0.00786	0.176
Fair	0.118	0.0866	0.314	.113**	0.0147	0.153
Oldest child is employed	0.358	.0901***	0.414	.119***	0.292	0.178
Second child is employed	0.552	.0796***	0.593	.104***	0.694	.17***
Co-resides with at least one child	0.0975	0.0628	0.0775	0.0754	-0.107	0.113
At least one child lives in the United States	0.556	.0633***	0.453	.0757***	1.11	.0994***
Average number of years of schooling of children	0.0224	.00915*	0.024	.0114*	0.0296	0.0173
Average number of children per child	-0.0097	0.0285	-0.0358	0.0348	-0.0882	0.0519

	All transfers		Frequent		Infrequent	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent or spouse work	-0.424	.0705***	-0.533	.0853***	-0.341	.116**
Respondent or spouse have health insurance (public or private)	0.249	.061***	0.296	.0742***	0.263	.111*
Respondent or spouse receive pension	-0.352	.0785***	-0.405	.0971***	-0.464	.14***
Respondent or spouse own a business	0.0431	0.0618	-0.0503	0.0773	0.295	.108**
Non-transfer income - quintile 2	-0.0204	0.0106	-0.0359	.0124**	-0.00719	0.0186
Non-transfer income - quintile 3	-0.0363	.00903***	-0.0418	.0107***	-0.00225	0.0153
Non-transfer income - quintile 4	-0.0629	.00844***	-0.0687	.01***	-0.029	.0146*
Non-transfer income - quintile 5	-0.0808	.00815***	-0.0917	.01***	-0.0411	.0139**
Natural logarithm of asset value	-0.037	.0145*	-0.0418	.0172*	-0.0754	.0232**
Constant	-0.971	.249***	-1.61	.303***	-3.23	.451***
Observations	8173		6605			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: MHAS 2001

Table 1.10 - OLS, Heckman and Tobit regressions on the conditional amount of transfers received frequently in 2001

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.061	0.0626	0.286	.0708***	0.656	0.365
Married, cohabits	0.138	.0624*	0.0999	0.0713	0.539	0.371
Resides in mostly urban area	0.174	.0566**	0.0419	0.0696	-0.0424	0.351
Age						
Under 55	<i>Reference</i>					
55 to 59	-0.031	0.0779	0.00245	0.0901	-0.388	0.472
60 to 64	0.032	0.0849	0.0725	0.101	-0.902	0.524
65 to 69	-0.070	0.0961	-0.0337	0.112	-1.63	.578**
70 to 74	-0.088	0.112	-0.045	0.128	-1.3	.649*
75 to 79	-0.049	0.125	0.0807	0.146	-1.26	0.737
80 and older	-0.291	.144*	-0.224	0.171	-3.44	.844***
Education						
0 years of schooling	<i>Reference</i>					
1-3 years of schooling	0.066	0.0664	0.0364	0.0788	-0.069	0.392
4-6 years of schooling	0.109	0.0719	0.0883	0.0858	0.255	0.433
7-9 years of schooling	0.190	0.109	0.00867	0.122	0.368	0.635
10-12 years of schooling	0.516	.226*	0.225	0.212	1.53	1.15
More than 12 years	0.063	0.187	-0.542	.212*	-2.25	1.19
Health						
Number of chronic illnesses diagnosed	0.041	0.028	0.0861	.032**	0.149	0.16
Self rated health as excellent, very good, or good	0.081	0.06	0.0578	0.0667	1.3	.348***
Family						
Number of children	0.046	.0104***	0.0886	.012***	0.151	.0607*
Average age of children	0.011	.00301***	0.0172	.00385***	0.0384	.0192*
Co-resides with at least one child	-0.239	.089**	-0.502	.103***	-2.13	.527***
At least one child lives in the United States	0.451	.064***	0.668	.0705***	-0.635	0.354
Average number of years of schooling of children	0.031	.0094***	0.0421	.0108***	0.0272	0.0546
At least one child is married	-0.123	0.115	-0.0976	0.12	-1.52	.641*
At least one co-resident child employed	0.186	.0766*	0.635	.0912***	2.11	.465***
At least one non-co-resident child employed	0.019	0.0955	0.25	.104*	0.458	0.55
Average number of children per child	-0.050	0.0261	-0.0549	0.0301	-0.435	.152**
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.118	.0393**	-0.16	.0462***	-0.422	0.235
Respondent or spouse work	-0.146	.0717*	-0.508	.083***	-1.06	.43*
Respondent or spouse have health insurance (public or	0.058	0.0598	0.202	.0708**	0.53	0.36

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
private)						
Respondent or spouse receive pension	-0.141	0.0816	-0.397	.0927***	-0.291	0.483
Respondent or spouse own a business	-0.010	0.0707	-0.0528	0.0777	-0.864	.408*
Non-transfer income - quintile 2	-0.015	0.00965	-0.0295	.0116*	-0.124	.0584*
Non-transfer income - quintile 3	-0.004	0.00932	-0.0215	.0104*	-0.0803	0.0537
Non-transfer income - quintile 4	0.007	0.00958	-0.0262	.0104*	-0.0494	0.0543
Non-transfer income - quintile 5	-0.001	0.00997	-0.0525	.0106***	-0.128	.0562*
Constant	9.11	.214***	7.38	.267***	3.37	1.31*
Observations	4723		6390		2243	
Uncensored observations	2243		2243			
Chi sq. P-value of the LR test of independence			0.000			

*Level of significance: * p<0.1; ** p<0.05; ***p<0.001*
Data: MHAS 2001

Table 1.11 - OLS, Heckman and Tobit regressions on the conditional amount of transfers received infrequently in 2001

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.062	0.0963	-0.041	0.119	0.490	0.713
Married, cohabits	0.215	0.113	0.202	0.107	0.855	0.75
Resides in mostly urban area	0.247	.0988*	0.241	.101*	1.850	.733*
Age						
Under 55	<i>Reference</i>					
55 to 59	-0.002	0.124	-0.061	0.136	0.430	0.991
60 to 64	-0.262	0.14	-0.362	.153*	1.170	1.08
65 to 69	-0.232	0.16	-0.362	.17*	1.410	1.18
70 to 74	-0.494	.205*	-0.626	.197**	1.100	1.36
75 to 79	-0.389	0.279	-0.498	.232*	-0.015	1.6
80 and older	-0.354	0.257	-0.562	.269*	0.966	1.74
Education						
0 years of schooling	<i>Reference</i>					
1-3 years of schooling	0.208	0.11	0.190	0.114	1.090	0.809
4-6 years of schooling	0.360	.115**	0.375	.126**	0.648	0.912
7-9 years of schooling	0.560	.176**	0.614	.177***	1.530	1.32
10-12 years of schooling	0.620	0.419	0.794	.358*	1.020	2.63
More than 12 years	0.595	.225**	0.704	.256**	4.760	2*
Health						
Number of chronic illnesses diagnosed	0.065	0.0429	0.044	0.0458	0.022	0.331
Self rated health as excellent, very good, or good	-0.091	0.101	-0.023	0.107	-0.392	0.737
Family						
Number of children	0.045	.0165**	0.026	0.019	0.074	0.125
Average age of children	0.012	0.00698	0.011	0.00631	-0.019	0.0385
Co-resides with at least one child	-0.072	0.139	0.001	0.138	-0.537	0.988
At least one child lives in the United States	0.199	.0882*	-0.125	0.185	4.600	.661***
Average number of years of schooling of children	0.033	.015*	0.024	0.0163	0.058	0.117
At least one child is married	-0.072	0.202	-0.083	0.207	-0.572	1.39
At least one co-resident child employed	0.216	0.116	0.154	0.123	-1.460	0.879
At least one non-co-resident child employed	0.157	0.185	-0.083	0.227	3.480	1.23**
Average number of children per child	-0.068	0.0507	-0.059	0.0479	-0.595	0.314
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.151	.0649*	-0.126	0.0697	-0.082	0.488
Respondent or spouse work	-0.342	.125**	-0.235	0.14	0.480	0.826
Respondent or spouse have health insurance (public or private)	-0.238	.0986*	-0.301	.107**	-0.208	0.746

Respondent or spouse receive pension	0.110	0.131	0.272	0.159	-0.892	0.955
Respondent or spouse own a business	0.078	0.0991	0.002	0.117	1.750	.766*
Non-transfer income - quintile 2	-0.017	0.0181	-0.014	0.0183	0.079	0.122
Non-transfer income - quintile 3	-0.017	0.0171	-0.015	0.0161	0.256	.106*
Non-transfer income - quintile 4	-0.012	0.0151	0.000	0.0168	0.224	.106*
Non-transfer income - quintile 5	0.006	0.0158	0.020	0.0171	0.339	.104**
Constant	8.19	.373***	9.72	.857***	-21.6	2.89***
Observations	4723		4821		674	
Uncensored observations	674		674			
Chi sq. P-value of the LR test of independence			0.2984			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$
Data: MHAS 2001

Table 1.12 - OLS, Heckman and Tobit regressions on the conditional amount of transfers received in 2003

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.169	.0556**	0.182	.0667**	0.176	0.121
Married, cohabits	0.221	.0586***	0.22	.0569***	0.551	.128***
Resides in mostly urban area	0.126	.056*	0.113	0.0677	0.228	0.128
Age						
Under 55	<i>Reference</i>					
55 to 59	0.0389	0.0717	0.0427	0.0736	-0.0321	0.139
60 to 64	0.107	0.0815	0.116	0.0841	0.0681	0.162
65 to 69	0.0555	0.0869	0.0633	0.0901	-0.181	0.187
70 to 74	0.163	0.102	0.176	0.106	0.128	0.22
75 to 79	0.131	0.117	0.141	0.118	-0.0455	0.269
80 and older	0.0925	0.133	0.11	0.14	-1.04	.333**
Education						
0 years of schooling	<i>Reference</i>					
1-3 years of schooling	0.0587	0.0611	0.0588	0.0605	0.0769	0.14
4-6 years of schooling	0.0708	0.0664	0.069	0.0687	0.0931	0.157
7-9 years of schooling	0.2	.0983*	0.191	0.103	-0.0121	0.217
10-12 years of schooling	0.0439	0.201	0.0283	0.192	-0.0584	0.395
More than 12 years	0.357	.173*	0.317	0.213	-0.206	0.408
Health						
Number of chronic illnesses diagnosed	0.0283	0.023	0.0277	0.0226	0.0251	0.0519
Self rated health as excellent, very good, or good	0.0862	0.0559	0.0833	0.0558	0.838	.104***
Family						
Number of children	0.0751	.00933***	0.0762	.0098***	0.0509	.0212*
Average age of children	0.00308	0.00291	0.00326	0.003	-0.014	.00705*
Co-resides with at least one child	-0.0636	0.0763	-0.0673	0.0748	-0.577	.165***
At least one child lives in the United States	0.271	.0567***	0.293	.0835***	0.187	0.124
Average number of years of schooling of children	0.0376	.00869***	0.0381	.00863***	0.0417	.0199*
At least one child is married	-0.0207	0.0946	-0.0189	0.101	0.00596	0.228
At least one co-resident child employed	0.0596	0.074	0.0666	0.0761	0.378	.168*
At least one non-co-resident child employed	-0.118	0.0846	-0.0991	0.102	0.236	0.207
Average number of children per child	-0.119	.0236***	-0.119	.023***	-0.138	.0565*
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.0717	.0335*	-0.0732	.033*	0.202	.0762**
Respondent or spouse work	-0.397	.067***	-0.417	.0844***	-0.273	.133*
Respondent or spouse have health insurance (public or private)	0.108	0.0559	0.114	.0581*	0.204	0.125

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent or spouse receive pension	-0.144	0.0766	-0.159	0.0848	-0.301	0.164
Respondent or spouse own a business	-0.0997	0.0616	-0.0954	0.0607	-0.0758	0.125
Non-transfer income - quintile 2	-0.025	.00847**	-0.0249	.00776**	0.0132	0.017
Non-transfer income - quintile 3	-0.0268	.0085**	-0.027	.00765***	0.0109	0.0169
Non-transfer income - quintile 4	-0.0177	.00805*	-0.0188	.00826*	0.00768	0.0155
Non-transfer income - quintile 5	-0.0121	0.00887	-0.0146	0.0111	0.0234	0.016
Constant	8.88	.186***	8.77	.372***	7.05	.434***
Observations	3809		7720		3484	
Uncensored observations	3484		3484			
Chi sq. P-value of the LR test of independence			0.7394			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: MHAS 2003

Table 1.13 - OLS, Heckman and Tobit regressions on the conditional amount of transfers received frequently in 2003

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.0557	0.0448	-0.0355	0.0524	0.536	.235*
Married, cohabits	0.12	.0488*	0.107	.0505*	1.06	.244***
Resides in mostly urban area	0.0608	0.0462	0.14	.0514**	0.436	0.231
Age						
Under 55	<i>Reference</i>					
55 to 59	0.084	0.06	0.0618	0.0635	0.201	0.298
60 to 64	0.152	.0655*	0.106	0.0708	-0.0319	0.334
65 to 69	0.113	0.0724	0.0694	0.0771	-0.099	0.366
70 to 74	0.145	0.0825	0.0842	0.089	-0.0691	0.427
75 to 79	0.108	0.096	0.0567	0.101	-0.0722	0.482
80 and older	0.221	0.114	0.127	0.118	-1.08	0.573
Education						
0 years of schooling	<i>Reference</i>					
1-3 years of schooling	0.0674	0.0503	0.0723	0.0531	-0.0527	0.252
4-6 years of schooling	0.0828	0.056	0.0985	0.0597	-0.00982	0.282
7-9 years of schooling	0.263	.0805**	0.332	.0879***	-0.499	0.414
10-12 years of schooling	0.351	.17*	0.502	.175**	-1.57	0.888
More than 12 years	0.142	0.167	0.405	.168*	-1.42	0.812
Health						
Number of chronic illnesses diagnosed	0.0302	0.0184	0.0311	0.0196	0.117	0.0935
Self rated health as excellent, very good, or good	0.0249	0.046	0.0322	0.0479	1.11	.221***
Family						
Number of children	0.0573	.00754***	0.0479	.00853***	0.104	.0399**
Average age of children	0.000602	0.00245	-0.000388	0.00261	-0.0235	0.0127
Co-resides with at least one child	-0.0331	0.067	-0.00969	0.0653	-0.651	.317*
At least one child lives in the United States	0.367	.0475***	0.274	.0531***	-1.19	.243***
Average number of years of schooling of children	0.0434	.0073***	0.0407	.00744***	0.0172	0.0356
At least one child is married	-0.13	0.0802	-0.139	0.086	-0.101	0.418
At least one co-resident child employed	0.0663	0.0635	0.0196	0.0652	0.539	0.316
At least one non-co-resident child employed	0.0603	0.0683	-0.0249	0.076	-0.381	0.349
Average number of children per child	-0.0841	.0192***	-0.0791	.0204***	-0.251	.0996*
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.0583	.0272*	-0.0522	0.0286	0.332	.138*
Respondent or spouse work	-0.252	.0565***	-0.107	0.0635	-0.734	.26**
Respondent or spouse have health insurance (public or private)	0.0611	0.046	0.0142	0.0498	0.445	0.235
Respondent or spouse receive pension	-0.159	.0645*	-0.0687	0.066	0.166	0.303

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent or spouse own a business	-0.0906	0.0523	-0.104	.0528*	-0.416	0.257
Non-transfer income - quintile 2	-0.0187	.00742*	-0.0187	.00678**	-0.0037	0.0324
Non-transfer income - quintile 3	-0.0171	.00686*	-0.0133	0.00688	-0.0782	.0334*
Non-transfer income - quintile 4	-0.00805	0.00638	0.000365	0.00699	-0.0645	.0325*
Non-transfer income - quintile 5	0.00168	0.00733	0.021	.00863*	-0.122	.0375**
Constant	9.04	.156***	9.72	.223***	5.55	.798***
Observations	3809		7007		2771	
Uncensored observations	2771		2771			
Chi sq. P-value of the LR test of independence			0.1812			

*Level of significance: * p<0.1; ** p<0.05; ***p<0.001*

Data: MHAS 2003

Table 1.14 - OLS, Heckman and Tobit regressions on the conditional amount of transfers received infrequently in 2003

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.223	0.128	0.237	0.134	-1.77	.71*
Married, cohabits	0.141	0.131	0.116	0.156	-2.14	.761**
Resides in mostly urban area	-0.0296	0.136	-0.0843	0.23	-1.27	0.722
Age						
Under 55	<i>Reference</i>					
55 to 59	-0.369	.166*	-0.361	.169*	-0.683	0.97
60 to 64	-0.339	0.203	-0.314	0.205	-0.319	1.05
65 to 69	-0.209	0.221	-0.194	0.206	-0.804	1.19
70 to 74	0.138	0.257	0.172	0.272	-0.441	1.4
75 to 79	0.123	0.282	0.166	0.31	0.301	1.51
80 and older	-0.284	0.314	-0.231	0.376	-1.27	1.83
Education						
0 years of schooling	<i>Reference</i>					
1-3 years of schooling	-0.0537	0.14	-0.0491	0.147	0.406	0.807
4-6 years of schooling	-0.0288	0.164	-0.0309	0.168	0.0397	0.919
7-9 years of schooling	0.204	0.282	0.202	0.237	0.891	1.3
10-12 years of schooling	0.0298	0.373	0.0599	0.376	3.96	1.98*
More than 12 years	1.01	.38**	0.963	.428*	2.28	2.24
Health						
Number of chronic illnesses diagnosed	0.0783	0.0595	0.0741	0.0588	-0.107	0.304
Self rated health as excellent, very good, or good	0.239	0.16	0.215	0.164	-0.277	0.748
Family						
Number of children	0.0891	.023***	0.0878	.0224***	-0.251	.125*
Average age of children	0.0143	.00662*	0.0142	.00704*	-0.0251	0.0409
Co-resides with at least one child	-0.155	0.177	-0.176	0.196	-1.1	0.983
At least one child lives in the United States	0.735	.123***	0.866	0.467	5.1	.651***
Average number of years of schooling of children	0.0587	.0216**	0.0611	.0231**	0.147	0.112
At least one child is married	-0.384	0.234	-0.393	0.256	-0.624	1.4
At least one co-resident child employed	-0.0583	0.176	-0.0501	0.186	-0.0572	0.968
At least one non-co-resident child employed	0.401	0.273	0.526	0.515	5.68	1.41***
Average number of children per child	-0.129	.0589*	-0.12	0.0635	0.444	0.304
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.161	0.0845	-0.162	.0785*	0.211	0.447
Respondent or spouse work	-0.248	0.17	-0.242	0.152	3.72	.845***
Respondent or spouse have health insurance (public or private)	0.115	0.126	0.117	0.131	-1.23	0.72
Respondent or spouse receive pension	-0.299	0.207	-0.345	0.234	-0.592	0.959
Respondent or spouse own a business	0.0636	0.142	0.09	0.159	1.18	0.754

	OLS		Heckman		Tobit	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Non-transfer income - quintile 2	0.00401	0.0201	0.006	0.0198	0.193	0.106
Non-transfer income - quintile 3	-0.0163	0.0198	-0.0135	0.0196	0.319	.102**
Non-transfer income - quintile 4	0.0137	0.0197	0.015	0.0177	0.358	.103***
Non-transfer income - quintile 5	0.0226	0.0212	0.0222	0.0173	0.502	.104***
Constant	6.86	.574***	6.32	1.92**	-19.5	2.69***
Observations	3809		4758		522	
Uncensored observations	522		522			
Chi sq. P-value of the LR test of independence			0.7595			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: MHAS 2003

Table 1.15 - Tobit regressions on the amount of transfers, the amount received frequently and the amount received infrequently including selected respondent's intent to repay and perception of counting on transfer as source of income in the future in 2001

	All		FREQUENT		INFREQUENT	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.225	0.199	0.128	0.321	0.191	0.702
Married, cohabits	0.351	0.198	0.245	0.32	0.589	0.738
Resides in mostly urban area	0.745	.189***	0.261	0.305	1.99	.713**
Age						
Under 55						
55 to 59	-0.527	.257*	-0.79	0.421	0.247	0.969
60 to 64	-0.784	.286**	-1.38	.472**	0.966	1.05
65 to 69	-0.918	.314**	-1.79	.508***	1.44	1.15
70 to 74	-1.07	.35**	-1.85	.568**	0.773	1.32
75 to 79	-1.11	.407**	-1.65	.629**	0.0856	1.58
80 and older	-1.91	.459***	-3.09	.73***	1.21	1.7
Education						
0 years of schooling						
1-3 years of schooling	0.0475	0.21	-0.302	0.336	0.909	0.792
4-6 years of schooling	0.181	0.234	0.0855	0.38	0.181	0.885
7-9 years of schooling	0.339	0.338	0.0973	0.555	1.02	1.29
10-12 years of schooling	1.11	0.658	1.46	1.02	1.02	2.6
More than 12 years	0.528	0.617	-1.69	1.09	4.36	1.95*
Health						
Number of chronic illnesses diagnosed	-0.05	0.0869	-0.0422	0.139	-0.0742	0.327
Self rated health as excellent, very good, or good	0.352	0.19	0.598	0.308	-0.791	0.724
Family						
Number of children	0.101	.0329**	0.132	.0537*	0.0655	0.121
Average age of children	0.017	0.0104	0.0292	0.0165	-0.0235	0.0381
Co-resides with at least one child	-0.879	.282**	-1.27	.468**	-0.0782	0.966
At least one child lives in the United States	0.387	.184*	-1.03	.312***	4.15	.645***
Average number of years of schooling of children	0.0203	0.0298	-0.0242	0.0484	0.0324	0.115
At least one child is married	-1.13	.371**	-1.52	.583**	-0.902	1.37
At least one co-resident child employed	0.586	.251*	1.35	.415**	-1.88	.857*

	All		FREQUENT		INFREQUENT	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
At least one non-CO-resident child employed	0.716	.314*	0.126	0.49	3.43	1.21**
Average number of children per child	-0.251	.081**	-0.245	0.129	-0.442	0.304
Respondent's rating of child's financial situation (higher score indicates poorer rating)	-0.102	0.126	-0.221	0.204	0.0311	0.481
Respondent or spouse work	-0.26	0.237	-0.548	0.38	0.847	0.827
Respondent or spouse have health insurance (public or private)	0.19	0.195	0.367	0.317	-0.223	0.731
Respondent or spouse receive pension	0.158	0.263	0.27	0.425	-0.58	0.936
Respondent or spouse own a business	0.0885	0.217	-0.673	0.36	1.74	.749*
Non-transfer income - quintile 2	-0.0984	.0318**	-0.132	.0502**	0.0628	0.12
Non-transfer income - quintile 3	-0.0475	0.0294	-0.103	.0472*	0.233	.105*
Non-transfer income - quintile 4	-0.0206	0.0303	-0.0695	0.0478	0.212	.105*
Non-transfer income - quintile 5	0.0105	0.0301	-0.0946	0.0496	0.359	.104***
Must repay child's help	7.79	.194***	7.84	.422***	8.82	.925***
Can count with help in the future	8.3	.172***	9.15	.29***	7.08	.729***
Interaction Repay * Count for future	-7.97	.22***	-7.76	.534***	-10.2	1.29***
Constant	1.39	0.721	0.312	1.16	-23.9	2.86***
Uncensored observations	3027		2243		674	

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$
Data: MHAS 2001

Table 1.16 - Tobit regressions on the amount of transfers, the amount received frequently and the amount received infrequently including selected respondent's intent to repay and perception of counting on transfer as source of income in the future in 2003

	All		FREQUENT		INFREQUENT	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Respondent is female	0.185	0.114	0.546	.228*	-1.78	.708*
Married, cohabits	0.469	.122***	0.946	.237***	-2.11	.761**
Resides in mostly urban area	0.193	0.119	0.382	0.222	-1.26	0.722
Age						
Under 55						
55 to 59	-0.071	0.136	0.139	0.292	-0.672	0.968
60 to 64	0.008	0.158	-0.119	0.329	-0.297	1.050
65 to 69	-0.286	0.178	-0.251	0.356	-0.749	1.190
70 to 74	-0.023	0.206	-0.282	0.413	-0.328	1.410
75 to 79	-0.153	0.250	-0.240	0.460	0.360	1.510
80 and older	-1.050	.303***	-1.120	.545*	-1.230	1.830
Education						
0 years of schooling						
1-3 years of schooling	0.090	0.128	-0.045	0.241	0.385	0.805
4-6 years of schooling	0.133	0.145	0.046	0.272	0.022	0.918
7-9 years of schooling	0.114	0.205	-0.339	0.399	0.820	1.290
10-12 years of schooling	0.125	0.365	-1.310	0.863	3.870	1.980
More than 12 years	0.136	0.386	-0.981	0.776	2.070	2.240
Health						
Number of chronic illnesses diagnosed	0.005	0.048	0.089	0.090	-0.089	0.304
Self rated health as excellent, very good, or good	0.727	.103***	0.970	.217***	-0.236	0.749
Family						
Number of children	0.039	.0199*	0.087	.0385*	-0.244	0.124
Average age of children	-0.016	.00672*	-0.027	.0125*	-0.022	0.041
Co-resides with at least one child	-0.609	.156***	-0.706	.308*	-1.060	0.986
At least one child lives in the United States	0.263	.116*	-1.070	.235***	5.090	.652***
Average number of years of schooling of children	0.043	.0182*	0.020	0.034	0.149	0.112
At least one child is married	-0.109	0.209	-0.267	0.402	-0.560	1.400
At least one co-resident child employed	0.399	.157*	0.570	0.306	-0.077	0.971

	All		FREQUENT		INFREQUENT	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
At least one non-co-resident child employed	0.182	0.195	-0.458	0.336	5.670	1.41***
Average number of children per child	-0.111	.0523*	-0.209	.0961*	0.431	0.303
Respondent's rating of child's financial situation (higher score indicates poorer rating)	0.247	.0723***	0.398	.135**	0.174	0.448
Respondent or spouse work	-0.224	0.129	-0.674	.255**	3.660	.845***
Respondent or spouse have health insurance (public or private)	0.183	0.117	0.421	0.227	-1.200	0.721
Respondent or spouse receive pension	-0.315	.156*	0.136	0.294	-0.610	0.960
Respondent or spouse own a business	-0.048	0.120	-0.376	0.251	1.150	0.753
Non-transfer income - quintile 2	0.006	0.016	-0.013	0.031	0.194	0.106
Non-transfer income - quintile 3	0.006	0.016	-0.084	.0327*	0.320	.102**
Non-transfer income - quintile 4	0.003	0.015	-0.070	.0319*	0.361	.103***
Non-transfer income - quintile 5	0.012	0.016	-0.134	.0369***	0.509	.104***
Must repay child's help	2.190	.163***	3.320	.331***	-0.570	1.070
Can count with help in the future	2.630	.153***	3.700	.255***	-1.470	0.753
Interaction Repay * Count for future	-2.400	.189***	-3.630	.397***	0.939	1.350
Constant	5.490	.419***	3.320	.789***	-18.700	2.71***
Uncensored observations	3484		2771		522	

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: MHAS 2003

Table 1.17 - Tobit regressions on the amount of transfers using individual children information

	ALL				FREQUENT				INFREQUENT			
	2001		2003		2001		2003		2001		2003	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Respondent is female	0.445	0.242	0.169	0.124	0.514	0.359	0.482	.241*	-0.156	0.750	-0.306	0.750
Married, cohabits	0.409	0.241	0.487	.129***	0.242	0.358	1.030	.247***	0.767	0.769	0.915	0.773
Resides in mostly urban area	0.645	.233**	0.236	0.128	0.151	0.344	0.426	0.233	1.890	.748*	1.330	0.746
Age												
55 to 59	-0.201	0.303	0.020	0.140	-0.331	0.458	0.171	0.301	0.297	1.000	-0.315	1.020
60 to 64	-0.267	0.347	0.141	0.166	-0.689	0.524	-0.009	0.347	0.927	1.120	0.621	1.120
65 to 69	-0.394	0.393	-0.048	0.198	-0.979	0.588	-0.007	0.392	1.270	1.270	0.651	1.270
70 to 74	-0.392	0.469	0.304	0.238	-0.820	0.702	0.005	0.468	1.050	1.530	0.183	1.510
75 to 79	-0.412	0.544	0.135	0.290	-0.458	0.793	-0.018	0.537	-0.204	1.810	-1.610	1.790
80 and older	-1.850	.647**	-0.853	.37*	-2.970	.959**	-1.030	0.659	0.811	2.020	-0.716	1.980
Education												
1-3 years of schooling	-0.030	0.261	0.032	0.140	-0.477	0.385	-0.103	0.253	1.400	0.838	1.170	0.835
4-6 years of schooling	0.053	0.287	0.048	0.156	-0.090	0.425	-0.057	0.282	0.132	0.947	0.589	0.936
7-9 years of schooling	0.512	0.403	0.002	0.221	0.023	0.619	-0.477	0.415	2.100	1.350	1.170	1.390
10-12 years of schooling	0.593	0.751	-0.081	0.398	0.551	1.110	-1.630	0.888	1.400	2.670	1.170	2.670
More than 12 years	0.433	0.676	-0.226	0.401	-2.090	1.130	-1.330	0.817	5.050	1.98*	5.610	2.05**
Health												
Number of chronic illnesses diagnosed	0.032	0.105	0.031	0.053	0.067	0.157	0.144	0.095	-0.027	0.344	-0.167	0.318
Self rated health as excellent, very good, or good	0.504	.226*	0.810	.104***	0.635	0.342	1.090	.222***	-0.316	0.756	0.140	0.773
Family												
Number of children	0.218	.0389***	0.071	.0221**	0.224	.0585***	0.123	.0406**	0.239	0.126	0.290	.124*
Age of oldest child	0.006	0.018	-0.020	.00955*	-0.004	0.026	-0.027	0.018	0.036	0.056	0.029	0.055
Oldest child is female	0.291	0.194	-0.038	0.102	0.553	0.290	0.003	0.192	-0.801	0.632	-0.745	0.634
Oldest child is married	-0.490	0.256	-0.050	0.141	-0.883	.385*	-0.485	0.250	0.636	0.890	0.722	0.894
Second child is married	-0.610	.25*	0.034	0.137	-1.010	.374**	-0.137	0.256	0.658	0.857	0.927	0.860
Financial situation of oldest child												
Excellent	0.746	1.020	-0.286	0.721	0.329	1.940	-0.003	1.270	2.220	3.430	1.890	3.460
Very good	1.520	.669*	-0.347	0.450	1.210	1.040	-0.062	0.747	0.595	2.140	0.976	2.090
Good	1.090	.402**	-0.059	0.215	1.960	.591***	-0.068	0.386	-1.420	1.240	-1.760	1.230

	ALL				FREQUENT				INFREQUENT			
	2001		2003		2001		2003		2001		2003	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Fair	0.965	.366**	-0.053	0.195	1.540	.536**	0.169	0.346	-1.190	1.090	-1.560	1.100
Oldest child is employed	0.194	0.401	0.446	0.238	0.336	0.597	-0.191	0.378	-0.077	1.240	0.064	1.270
Second child is employed	0.142	0.352	0.163	0.181	-0.140	0.511	0.414	0.341	0.511	1.190	0.109	1.150
Co-resides with at least one child	-0.398	0.242	-0.285	.121*	-0.103	0.365	-0.213	0.233	-1.670	.77*	-1.570	.741*
At least one child lives in the United States	0.556	.222*	0.124	0.122	-0.999	.344**	-1.290	.242***	4.590	.674***	2.860	.706***
Average number of years of schooling of children	-0.006	0.037	0.027	0.020	-0.051	0.054	-0.011	0.036	0.048	0.120	0.034	0.117
Average number of children per child	-0.329	.111**	-0.133	.0627*	-0.275	0.162	-0.240	.108*	-0.605	0.350	-0.474	0.336
Respondent or spouse work	-0.479	0.278	-0.238	0.134	-0.783	0.416	-0.694	.262**	0.602	0.851	-0.436	0.857
Respondent or spouse have health insurance (public or private)	0.093	0.237	0.197	0.127	0.193	0.354	0.411	0.236	-0.175	0.772	-1.870	.764*
Respondent or spouse receive pension	0.000	0.312	-0.302	0.166	0.145	0.466	0.164	0.306	-0.950	0.979	-0.474	0.982
Respondent or spouse own a business	-0.048	0.255	-0.087	0.126	-0.839	.391*	-0.436	0.259	1.710	.773*	0.812	0.811
Count on child's future help (donor 1)	2.730	.205***	0.048	0.190	2.950	.438***	0.533	0.360	1.620	1.140	2.450	1.13*
Count on child's future help (donor 2)	2.730	.212***	0.095	0.208	2.620	.458***	0.294	0.388	2.900	1.21*	2.150	1.210
Count on child's future help (donor 3)	2.060	.222***	0.014	0.229	3.240	.473***	-0.092	0.413	-1.400	1.290	-0.616	1.280
Must repay child's help (to donor 1)	1.590	.253***	0.110	0.218	0.990	0.541	-0.748	0.474	2.990	1.28*	2.030	1.310
Must repay child's help (to donor 2)	1.290	.271***	0.463	.227*	2.050	.567***	0.828	0.485	-1.160	1.420	0.110	1.410
Must repay child's help (to donor 3)	1.260	.292***	0.175	0.268	0.551	0.612	0.914	0.510	3.290	1.45*	3.200	1.45*
Non-transfer income - quintile 2	-0.079	.0391*	0.012	0.017	-0.123	.0569*	0.000	0.033	0.146	0.128	0.057	0.111
Non-transfer income - quintile 3	0.002	0.035	0.011	0.017	-0.059	0.052	-0.074	.0335*	0.324	.111**	0.300	.104**
Non-transfer income - quintile 4	-0.008	0.035	0.008	0.016	-0.069	0.052	-0.060	0.033	0.285	.109**	0.259	.105*
Non-transfer income - quintile 5	0.032	0.035	0.022	0.016	-0.079	0.053	-0.120	.038**	0.420	.106***	0.474	.107***
Natural logarithm of asset value	-0.097	0.052	0.032	0.018	-0.045	0.080	0.023	0.029	-0.377	.165*	-0.139	0.090
Constant	2.440	1.02*	7.510	.489***	0.330	1.520	6.610	.883***	-17.8	3.29***	-16.9	2.98***
Observations	4225		3764		4225		3764		4225		3764	

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$
Data: MHAS 2001, 2003

Table 1.18 - Tobit random effects regression on all transfers

	All		Bottom 50%		Top 50%	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Married, cohabits	0.447	.129***	0.214	0.191	0.164	0.155
Co-resides with at least 1 family member	-0.0214	0.0256	-0.0773	.038*	0.0522	0.0307
At least one child lives in the United States	0.603	.137***	0.356	0.206	0.441	.161**
Talks daily with at least one child	0.22	0.117	0.199	0.177	0.213	0.138
Talks weekly with at least one child	0.352	.119**	0.562	.18**	0.0726	0.14
Talks monthly with at least one child	-0.111	0.134	0.338	0.195	-0.5	.166**
Talks yearly with at least one child	-0.414	.127**	-0.396	.186*	-0.0927	0.156
Respondent is employed	-0.452	.151**	-0.438	0.241	-0.361	.166*
Natural logarithm of salary earnings	-0.026	0.199	-0.173	0.354	-0.416	.206*
Natural logarithm of business revenue	0.236	0.202	0.332	0.349	-0.0999	0.21
Natural logarithm of pension earnings	-0.105	0.198	-0.838	.358*	0.345	0.199
Respondent or spouse have social security coverage	0.616	.131***	0.596	.195**	0.069	0.161
Natural logarithm of non-transfer earnings	0.00171	0.0207	0.0264	0.0333	-0.214	.0246***
Health score (higher means worse health)	0.119	.00946***	0.135	.0141***	0.0623	.0113***
Constant	3.96	.225***	2.71	.322***	8.81	.307***
Observations	8695		4917		3778	

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: MHAS 2001, 2003

Note: Bottom 50% includes respondents whose income is in the lowest half of the income distribution. Top 50% refers to the top half of the income distribution.

Table 1.19 - Tobit random effects regression on frequent transfers

	All		Bottom 50%		Top 50%	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Married, cohabits	0.447	.129***	0.214	0.191	0.164	0.155
Co-resides with at least 1 family member	-0.0214	0.0256	-0.0773	.038*	0.0522	0.0307
At least one child lives in the United States	0.603	.137***	0.356	0.206	0.441	.161**
Talks daily with at least one child	0.22	0.117	0.199	0.177	0.213	0.138
Talks weekly with at least one child	0.352	.119**	0.562	.18**	0.0726	0.14
Talks monthly with at least one child	-0.111	0.134	0.338	0.195	-0.5	.166**
Talks yearly with at least one child	-0.414	.127**	-0.396	.186*	-0.0927	0.156
Respondent is employed	-0.452	.151**	-0.438	0.241	-0.361	.166*
Natural logarithm of salary earnings	-0.026	0.199	-0.173	0.354	-0.416	.206*
Natural logarithm of business revenue	0.236	0.202	0.332	0.349	-0.0999	0.21
Natural logarithm of pension earnings	-0.105	0.198	-0.838	.358*	0.345	0.199
Respondent or spouse have social security coverage	0.616	.131***	0.596	.195**	0.069	0.161
Natural logarithm of non-transfer earnings	0.00171	0.0207	0.0264	0.0333	-0.214	.0246***
Health score (higher means worse health)	0.119	.00946***	0.135	.0141***	0.0623	.0113***
Constant	3.96	.225***	2.71	.322***	8.81	.307***
Observations	7171		4702		4545	

*Level of significance: * p<0.1; ** p<0.05; ***p<0.001*

Data: MHAS 2001, 2003

Note: Bottom 50% includes respondents whose income is in the lowest half of the income distribution. Top 50% refers to the top half of the income distribution.

Table 1.20 - Tobit random effects regression on infrequent transfers

	All		Bottom 50%		Top 50%	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Married, cohabits	0.541	.161***	-0.11	0.26	2.02	.314***
Co-resides with at least 1 family member	-0.00726	0.0319	-0.0662	0.0513	0.023	0.061
At least one child lives in the United States	0.375	.176*	-0.516	0.285	1.01	.328**
Talks daily with at least one child	0.382	.147**	0.497	.239*	0.53	.255*
Talks weekly with at least one child	0.444	.149**	0.762	.243**	0.374	0.259
Talks monthly with at least one child	-0.0983	0.17	0.516	0.266	-0.789	.295**
Talks yearly with at least one child	-0.57	.161***	-0.275	0.254	-1.22	.285***
Respondent is employed	-0.544	.191**	-0.565	0.325	-0.477	0.324
Natural logarithm of salary earnings	-0.0109	0.255	-2.48	.466***	0.495	0.406
Natural logarithm of business revenue	0.234	0.26	-0.236	0.463	0.482	0.41
Natural logarithm of pension earnings	-0.0444	0.252	-0.574	0.463	0.53	0.417
Respondent or spouse have social security coverage	0.715	.164***	0.0155	0.262	1.81	.31***
Natural logarithm of non-transfer earnings	-0.0156	0.0263	-0.145	.0445**	0.199	.0453***
Health score (higher means worse health)	0.143	.0119***	0.169	.0192***	0.215	.0215***
Constant	2.93	.281***	1.52	.438***	-5.58	.552**
Observations	3289		2698		2667	

*Level of significance: * p<0.1; ** p<0.05; ***p<0.001*

Data: MHAS 2001, 2003

Note: Bottom 50% includes respondents whose income is in the lowest half of the income distribution. Top 50% refers to the top half of the income distribution.

Table 1.21 - Tobit regressions on frequent and infrequent transfers with interaction terms between perceived reliability and income, by income quintile.

	Log of Infrequent		Log of Frequent	
	Log of Income	(Log of Income)x reliability	Log of Income	(Log of Income)x reliability
Quintile 2	-0.137 (0.098)	0.215 (0.107)*	-0.212 (0.051)***	0.291 (0.060)***
Quintile 3	-0.087 (0.077)	0.235 (0.087)**	-0.225 (0.048)***	0.328 (0.046)***
Quintile 4	-0.125 (0.069)	0.238 (0.078)**	-0.332 (0.043)***	0.496 (0.044)***
Quintile 5	-0.091 (0.064)	0.246 (0.073)***	-0.38 (0.042)***	0.526 (0.041)***
N Censored	4,148		4,148	
N Uncensored	674		2,244	

*Level of significance: * p<0.1; ** p<0.05; ***p<0.001
Data: MHAS 2001*

Chapter 2: The role of spouses and siblings in couples' decision to provide upstream transfers

2.1. Introduction

This chapter studies how individuals aged 50 and older who are either married or cohabitating, make decisions about transfers to their parents. In particular, this chapter aims to show how men and women's decisions to transfer to their parents are affected by two of their closest relations: their spouses or partners and their siblings. To do so, this chapter tests the role of (i) bargaining power, (ii) gender roles and competing commitments and (iii) agreement with and transfers from siblings to parents in married or cohabiting individual's decisions to provide upstream support. This analysis also accounts for having only mother, only father, or both parents alive due to previous findings regarding differences in upstream transfers to mothers compared to fathers.

This analysis is based on the Mexican case. Mexico's ongoing demographic transition indicates that, in the next few decades, an increasing number of individuals will be in need of financial resources and physical assistance. Even though great policy efforts are in place to address pension and health care needs of this group, for the oldest of these individuals, such assistance is more likely to be provided by their children. In this chapter, I address how these children, mainly those of age 50 and over, make decisions about providing time or money for their parents.

Individuals 50 and older differ from younger adult children in that they are more likely to have acquired commitments to their own families, to be close to or into retirement years, and to face health issues of their own. Therefore, individuals in this age group who face the choice of providing for their parents will see such choice shaped by how resources are split with their spouse, as well as the support parents receive from other sources. Here, I

focus on the support from siblings since they are the most likely to assist in caring for their parents.

This chapter shows that men and women's upstream transfer decisions are determined by their bargaining power, and that when women hold more bargaining power through their participation in the labor market, they are more likely to provide financial transfers. However, for women, financial transfers are determined by their spouses' earnings, but not their own, while the opposite occurs with men. Results also show that transfers from siblings to parents are complements of individuals' upstream transfers. In other words, when an individual gives transfers, so will at least one sibling. Agreements with siblings to share responsibility for parents' needs were associated a higher likelihood of upstream transfers of money and time suggesting that, even when other siblings do not give, an agreement to share responsibility motivates individuals to provide transfers.

This chapter is organized as follows. The second part introduces the conceptual framework, the third part explains the data and methods of analysis, the fourth part shows the results, and the last part concludes.

2.2. Literature review

This chapter discusses three theoretical frameworks of intergenerational transfers. Even though the conceptual work in this area is broad, applied research demonstrates that these frameworks are useful in explaining how individuals make decisions about upstream transfers (Lee, Parish et al. 1994; Lillard and Willis 1997; Ofstedal, Knodel et al. 1999; Friedman, Knodel et al. 2003; Lin, Goldman et al. 2003; Gomes 2007; Noël-Miller and Tfamily 2009).

Bargaining power: In the bargaining power framework, the power relations that determine upstream support may also occur between parent and child and between spouses. This chapter focuses on the bargaining relationship between spouses. In this framework, partners negotiate the distribution of the household resources, and the partner

with the greatest bargaining power controls a larger share. In other words, bargaining power will dictate how much of a couple's shared income is handled by each spouse. This share tends to increase for women when they become employed and/or have more wealth of their own. In the context of upstream transfers, this is relevant because women are assumed to have different consumption preferences than men. For instance, if a wife has low bargaining power, she will handle a lower proportion of the couple's resources. As a result, the household consumption will reflect the husband's consumption preferences rather than the wife's. If we assume each spouse cares only for their own parents, it could be reasonably expected that, when wives have lower bargaining power than their husbands, they will also be less likely to provide for their parents or to provide less (Thomas 1990; Lillard and Willis 1997). Previous research (Cox 1987; Altonji, Hayashi et al. 1997) shows that adult children's individual income is associated to higher likelihood of transfers and that as women's contribution to household income increases, so does the likelihood of upstream support to her parents. For instance, evidence for Malaysia (Cox 1987; Altonji, Hayashi et al. 1997) shows that the employment status and employment history of women is associated to higher likelihood and amount of transfers to the wife's but not the husband's parents. These studies, however, do not model actual or perceived bargaining power. A study for Korea (Ham and Song 2009) addresses this issue and concludes that, for all educational levels, husbands and wives tend to have similar bargaining power over the household resources and, when it comes to making a decision about upstream support, each spouse is only influenced by their individual earnings and not by their gender.

In most studies, women's bargaining power is indirectly measured by each spouse's individual current and/or lifetime earnings (Lee, Parish et al. 1994; Lillard and Willis 1997; Ham and Song 2009). Noell-Miller and Tfamily (2009) use a different approach. They study the allocation of upstream transfers to the wife's mother when at least one partner's mother is alive. Their data (the Mexican Health and Aging Study) includes self reported information about how much say each spouse has on family decisions compared to their spouse. They compared individuals who reported equal or greater say and those who reported less say than their spouse, and conclude that reporting more or equal say

has no incidence on women's upstream transfer decisions. (Noël-Miller and Tfamily 2009). A potential issue with this approach is that a large proportion of women reported equal say in family decisions. In such case, it is possible that variations might not be captured if the group with greater say is bundled together with those who reported equal say. Another characteristic of this study is its focus on mothers as recipients. This emphasis on mothers reflects their greater longevity when compared to their spouses. However, previous work (Friedman, Knodel et al. 2003) has suggested that children perceived their mothers differently from their fathers, which affects their upstream transfer decisions.

As mentioned above, bargaining may also occur between parent and child. If the child grows wealthier then, according to the bargaining power framework, parents become less able to influence their children's transfer decision. Therefore, wealthier children are less likely to give to their parents or would give less. Since children become less profitable as they become wealthier, later generations choose to have fewer children. However, evidence for Mexico and Taiwan shows that, even though younger generations are better off and have fewer children, they also give larger amounts of transfers than older generations (Lee, Parish et al. 1994; Lin, Goldman et al. 2003; Gomes 2007).

Gender roles and competing commitments. Individuals are socialized into different roles according to their gender, and this extends to each gender's perception of their obligation to their older parents. In some contexts, for instance in Taiwan and Korea, sons are expected to assume the role of time and financial providers (Lee, Parish et al. 1994; Lillard and Willis 1997; Ofstedal, Knodel et al. 1999; Lin, Goldman et al. 2003; Park 2010). In Western societies and much of Latin America, mothers have the role of caregivers, and so do their daughters. Results for the United States, for instance, show that, after marriage, women take on the role of caregivers for frail family members, and maintain contact with extended families (Lee, Parish et al. 1994), and similar results have been found for Mexico (Noël-Miller and Tfamily 2009).

This traditional gender role is accompanied by new roles and responsibilities as economies grow and women are more likely to participate in the labor market. The time

demanding by multiple roles limits the time available for family activities, making women more likely to perceive and experience role conflicts when they enter the labor market. Such role conflicts are also a predictor of perceived caregiver burden for daughters, but not sons – who are socialized as providers and not as caregivers (Lin, Goldman et al. 2003) and can fulfill their social roles by providing financial support rather than physical care and assistance. Overall, empirical research shows women are more likely than men to provide time to their parents (Lin, Goldman et al. 2003). However, some differences exist across countries in how gender and work roles relate to upstream transfers. In the Taiwanese context, for example, children who provide financial and time assistance to their parents tend to be employed and married (Lin, Goldman et al. 2003). Whereas in the United States children provide financial support rather than time once they enter the labor market (Zissimopoulos 2001).

External resources from siblings: This hypothesis states that siblings with more financial resources negotiate with their less well off siblings in a way that the one with more financial resources provides less co-residence and/or time, an obligation that falls on the less well off sibling (Lin, Goldman et al. 2003). Research for the United States has compared the role of men and women’s spouses and siblings in the provision of upstream transfers. For women, siblings are substitutes of time transfers. This means that, when women become unavailable to provide time to their parents (normally this occurs when entering the labor market), the amount of time transfers siblings provide increases. , For men, on the other hand, increase earnings are associated to higher time transfers from their wives to men’s parents (Zissimopoulos 2001).

Research for Mexico also shows that siblings may either substitute or complement each other’s transfers. Research about the Mexican case using MHAS by Antman (2007) compares children’s choices of money transfers when a sibling lives abroad and sends remittances to the parents, as well as choices of upstream time transfers when other sibling are providers of time¹¹. Antman finds that individuals who reside in Mexico

¹¹ This study uses MHAS respondents as parents, and so its focus is on transfers from children to parents 50 and older.

increase financial transfers when other siblings also provide them (i.e. they are strategic complements), but decrease time transfers if others give (i.e. they are strategic substitutes) (Antman 2007).

This chapter distinguishes between agreements and actual sibling contributions. Furthermore, it is expected that, if an agreement exists, children will be more likely to transfer according to the agreement, even when the sibling is not providing. I also distinguish between transfers and agreements to transfer personal care and financial resources.

Transfers to mothers and fathers

Differences in how children decide to transfer to their mothers and fathers could be thought of in terms of the parent's resource availability and roles for men and women that change over the life course. Regarding resources, early advantages may include investment in education and access to the labor market that affect a person's status and role in the household. As individuals age, transitions from employed to retired and from married to widowed can also affect a person's status and role within the household. In the case of men, old age implies a disruption of their role as providers. This is not the case for women, who continue to be perceived as caregivers and, therefore, may be considered valued members of the family (Friedman, Knodel et al. 2003) and likely recipients of upstream support. In Mexico, co-residence has been observed mostly in households with higher income per capita, and it is older women who are more likely to co-reside partly because of women's contributions to the household chores and as caregivers of children or grandchildren (Gomes 2007). Co-residence with older fathers is less likely, potentially because they tend to live with their spouse who may be of assistance with physical limitations. Other research has suggested that lower co-residence with older men depends on how they are perceived: in Mexico, "elderly men are not viewed as domestic collaborators, and sons-in-law are very reluctant to accept them living with their family and daughters" (Gomes 2007; page 551).

In addition to the continuity of women's role as caregivers as they age and its functionality from the child's perspective, it is possible that transfers decisions are driven by mothers developing closer emotional ties with their children than men (Friedman, Knodel et al. 2003), particularly with their daughters. Such ties may result in greater resource exchange with their daughters, even when they have left the households. Evidence in the United States and Europe, for instance, suggests that when it comes to resource exchange, there is preference for wives' relatives, even though, in these regions, married couples hold a bi-lateral system of kinship with each spouse's parents (Noël-Miller and Tfamily 2009). As a result, empirical evidence shows a preference for transfers towards the wife's mother, particularly if the mother is unmarried. Such transfers include co-residence, care and in-kind support, particularly among Hispanics and Blacks (Noël-Miller and Tfamily 2009).

2.3. Data and methods

a. Data

For the analysis pretended here, I use the Mexican Health and Aging Study (MHAS). MHAS is a longitudinal survey collected in 2001 and in 2003. The sample is nationally representative of Mexican adults 50 and older. The questionnaire collected information about the respondent and spouse, if present, regarding their health, sociodemographic characteristics and income from labor and other sources. It also collected sociodemographic information about all household members and non-co-resident children as well as information of resources transferred to the parents of the respondent and spouse in the two years prior to the survey. This analysis is based on data from the 2003 wave since it provides a non-censored measure of the amount of financial transfers.

It is worth noting that, in MHAS, respondents are "the middle" generation since data is collected about them, their parents, and their children. Here, I analyze respondents in their role as children given the availability of information about respondents' spouses and siblings, as well as the detailed information regarding income and asset ownership.

For this analysis, the MHAS sample is limited to married respondents or respondents living in consensual union in which each partner had at least one living parent. To simplify the presentation of results, I refer to each partner as husband or wife. However, the study is not a sample of couples, thus the husbands and wives of the respondents are not themselves respondents. The total sample size of MHAS in 2003 was 9172¹². Given that respondents were 50 or older, very few had living parents. Of the 2003 sample, 789 respondents were either married or cohabitating where both had at least one living parent. Each respondent accounted for one observation and all descriptive and regression analysis was done separately for men (n=568) and women (n=221).

The dependent variables measures whether the respondent or spouse give financial assistant to parents other than shared housing or shared meals¹³, how much money they provide over the two years prior to the survey¹⁴, and whether the respondent or spouse give help to parents with basic personal activities, like eating or bathing¹⁵. The questionnaire asked respondents to exclude help with household chores, errands and transportation.

b. Methods

Sample description: Since the unit of analysis is the respondent there is one observation per respondent. The characteristics of the sample describe all respondents, as well as for men and women separately. Results that split the sample by men and women may not necessarily reflect how couples provide upstream transfers to their respective parents. Therefore, results also show the proportion of couples in which only the husband's parents, only the wife's parents, both or neither set of parents receive transfers (i.e. time

¹² The attrition rate in MHAS was low. At baseline, MHAS included information on 9,862 households. Since 9,172 respondents (one respondent per household) were interviewed in 2003, the attrition rate was about 7 percent.

¹³ In the last 2 years, have you (and/or your spouse) given financial assistance to your parent(s)? Include help to pay costs such as rent; exclude shared housing or shared meals

¹⁴ In total, in the last 2 years, about how much did you spend financially assisting them?

¹⁵ In the last 2 years, did you (or your spouse) help your parents with basic personal activities such as dressing, eating, or bathing because of a health problem? Exclude help with household chores, errands, and transportation.

and money), and the proportion of wives that give to their parents, given the transfer decision of their spouse. These descriptive statistics are in Table 2.2 and in Table 2.3. In both tables, the unit of analysis is the spouse, meaning there is one observation for the husband, and another for the wife.

Assessment of bargaining power: The regression analysis uses indirect measures of bargaining power by accounting for the work status of the respondent and spouse, the amount of each spouse's earnings, whether each spouse receives pension, and the amount of the couple's assets. It is possible, however, that an individual decides to enter or remain in the labor market if the parent is ill or in need of financial or another type of assistance. In such case, the coefficients on work status, earnings and, possibly the amount of assets could be biased. I address this potential constraint in several ways. First, the regression analysis includes an indicator variable if the spouse of a respondent is the owner of the couple's dwelling but not the spouse, as well as an indicator variable if the respondent is the owner, but not the spouse. The identification assumption is that ownership of the property is independent of each spouse's preference for upstream transfers, but serves as an indicator of the resources available to the spouse that owns the property. Second, results include respondents' perception on whether they have more say than their spouse in family decisions, using as reference the group that perceived themselves as having equal or less say relative to their spouse.. Finally, the analysis accounts for schooling as a measure of earning capacity by including an indicator variable for respondents who have at least one more level of education than their spouse.

As mentioned above, earnings of the respondent and the spouse are entered as separate variables. Individual earnings include individual income from salary, pension and public transfers. Since the amount of earnings for respondent and spouse are heavily skewed, they are log transformed for the regression analysis.

Assessment of gender roles and competing commitments. I address differences among men and women in regression analyses that show if (i) the likelihood of upstream transfers differs for men and women and (ii) the role of labor force participation on the

likelihood of time and financial transfers, as well as the amount of financial transfers among men and women. As mentioned above, there may be differences in how men and women make decisions about transfers to their fathers and mothers. To account for these differences, the regression analysis includes an indicator variable if only the mother is alive and another if only the father is alive.

Insofar as the health of parents and their economic well-being may be driving respondents' decision about upstream support, the health status of parents is indicator on whether the mother needed assistance with basic tasks, such as eating or bathing, and one if the father did. For the socioeconomic status of the parents, respondents rated their parents' financial situation as excellent, very good, good, fair or poor. The analysis also uses an indicator variable if mother, father or both parents had a financial situation that was excellent, very good or good. The second measure for socioeconomic status is an indicator variable on whether the living parent or at least one of the parents had completed some elementary education.

Assessment of the role of siblings: MHAS asked respondents to report whether they had siblings who provided financial transfers to their parents and whether they had siblings who provided personal care. Furthermore, respondents reported whether they had made any agreement with their siblings to share responsibility for their parents' financial needs, as well as any agreement to share responsibility over their parents needs for personal care. That the sibling also assists a parent may not suffice to provide information about how respondents and siblings deal with upstream transfer decisions. As shown above, results for other countries indicate that some children may provide for their parents because they perceive it to be their duty, regardless of the siblings' choices. Therefore, the analysis also accounts for agreements about sharing responsibilities for the parents' time and financial needs in addition to whether siblings provide upstream support. Unlike the previous assessments, results are not shown by gender due to limited sample size.

Estimation strategy

The descriptive section shows the characteristics of the whole sample (i.e. all respondents), as well as for men and women. Also, I compare men and women's results through t-statistics. It is worth pointing out that all tests refer to respondents in general, and to differences between men and women.

The unit of analysis for the regressions is the respondent. This allows estimating regression coefficients of the relevant characteristics of respondents and their spouses. The regression analysis is presented for the whole sample of respondents, as well as for men and women separately. The results section reflects this distinction referring to differences between spouses and between men and women.

The likelihood of transfers is estimated through Probit regressions on the likelihood of being a provider of financial transfers, as well as on providing time transfers. This is shown in equation (1).

$$(9) P(T_i > 0) = \Phi(\beta_0 + \beta' X + u_i)$$

Here, T is an indicator variable indicating if the respondent gave upstream transfers (money or time) to the parent, subject to a set of covariates X and, for each covariate, β represents the vector of coefficients while u is the random component. Given that the probabilistic model is a Probit, Φ represents the normal distribution.

The amount of financial transfers is analyzed through a Tobit regression in which censored values are all those zero values given by respondent who did not provide financial support. The standard specification for the Tobit model is as follows:

$$(10) \begin{aligned} T_i^* &= X'_i \beta + e_i \\ T_i &= \max(0, t_i^*) \end{aligned}$$

Where T^* is a latent variable which we can observe only when it is greater than zero. The observed variable is given by T. Here, the log likelihood function is given by:

$$(11) \quad \ln L = \sum_0 \ln \left[1 - \Phi \left(\frac{X_i' \beta}{\sigma} \right) \right] + \sum_+ \ln \left[\frac{1}{\sigma} \varphi \left(\frac{t_i - X_i' \beta}{\sigma} \right) \right]$$

The first part of this regression is Tobit's correction for the censored transfers (this is represented by the "0" subscript of the first sum), while the second part corresponds to the uncensored sample (shown by the "+" subscript) (Wodajo, 2008). Also, $\Phi()$ and $\varphi()$ are the cumulative and probability density functions, respectively, of the normal distribution. Results are shown assuming that transfers are censored in those who did not give transfers. This is because children could be receiving something from their parents that remains unobserved. If this is the case the net value of transfers (transfers given minus transfers received) would be negative, justifying a Tobit model. In some cases, however, upstream transfers can simply be zero. Additional estimates are presented in the appendices using OLS and Tobit only for those respondents who claimed to give transfers.

2.4. Results

In order to examine any differences in transfer decisions made by men and women, I first provide an overview of respondents' characteristics, as well as those of their spouses and parents. Results, shown in Table 2.1, indicate if differences between men and women are statistically significant, denoted on the column for women.

The average age of this group is 51.3 years. This average is lower than the overall sample, which is expected given the sample restriction placed on having at least one parent who is alive. Women are, on average, 4 years older than men, a result consistent with women's greater life expectancy and that the data do not represent men and women from the same couples. Compared to their spouses, men are nearly 4 years older than their spouses, whereas women have, on average, the same age as their spouse.

Nearly two thirds of both men and women in this sample live in an urban area.

Educational attainment differed by gender among the respondents and in comparison to

their spouses. Men reported an average of 6.8 years of education, compared to 6.0 for their spouses. Women reported an average of 5.4 years of education. Since years of education might reflect small differences of one or two years that yield no influence on the share of each spouse bargaining power, the table also shows the percentage of respondents who have at least one more level of education than their spouse. For instance, the respondent might have finished primary school, while the spouse finished middle school. Results for men and women are contrasting. 31.1 percent of men have finished at least one more level of education than their spouse, while this is only true for 17.8 percent of women. On average, respondents had 4 to 5 children, and 44 percent of men reported at least one child less than 12 years of age lives in their household, compared to 31.2 percent among women. The result might be driven by the age differentials between genders insofar older parents (most to whom are women) might be less likely to have co-resident children.

As mentioned above, employment status is associated with higher share of bargaining power. Table 2.1 shows that 88.4 percent of the men reported that they work for pay, while this is the case of 35.6 percent of their spouses. The result is consistent for women: 26.2 percent the women reported to work for pay, compared to 84.6 percent of their spouses. Regarding pensions, 5.3 percent of respondents and 6.0 percent of spouses receive pension. When only analyzing women, results show that 10.4 percent of their spouses receive pension, while only 6.4 percent of women do. In contrast, the results for men are less contrasting: 4.9 percent of men receive a pension, compared to 4.2 percent of men's spouses.

Income comparisons are subject to the large variations of the sample due to extreme values. Even in this reduced sample size, the variations in income are substantial. Results suggest, however, that men's individual earnings are larger than women's (US\$7,841 for men, compared to US\$4,449 among women).

The most explicit measure of household bargaining power is each spouse's perceived role in household decision making. Most respondents (62.5 percent) reported have similar say

than their spouses, 4.3 percent of men reported they had less say in the decision making, compared to 23.3 percent of women. In contrast, 33.2 percent of men reported they had more, compared to 17.0 percent of women.

The last set of variables in Table 2.1 refers to siblings. On average, respondents had about 6 siblings, over half had siblings who provided financial support, and 22.9 percent had siblings who gave personal care. Finally, about a third of all respondents had agreed with at least one sibling to share responsibilities of parents' financial needs and 30.6 percent had agreements about sharing responsibility. These results are similar for both men and women, with no statistical difference found.

Table 2.1 – Characteristics of respondents, their spouses and parents of the respondent, overall and by sex of the respondent

	All		Men		Women	
	%/mean	SE	%/mean	SE	%/mean	SE
Characteristics of Respondent and spouse						
Respondent's age (mean)	51.3	6.3	50.1	6.7	54.1***	4.0
Spouse's age	48.4	7.6	46.2	6.9	54.1***	6.0
Lives in an urban area	65.4%	0.476	64.9%	0.478	66.5%	0.473
Respondent's years of education (mean)	6.4	5.1	6.8	5.3	5.4***	4.6
Spouse's years of education (mean)	6.1	4.6	6.0	4.4	6.2	5.1
Respondent has more schooling than spouse ¹	27.3%	0.446	31.1%	0.463	17.8%***	0.383
Number of living children of respondent and/or spouse	4.7	2.6	4.6	2.5	4.9	2.8
One or more children under 12 years of age live in the household	40.4%	0.491	44.0%	0.497	31.2%**	0.464
Employment and income characteristics of respondent and spouse						
Respondent is currently working for pay	71.0%	0.454	88.4%	0.321	26.2%***	0.441
Spouse of respondent is currently working for pay	49.3%	0.500	35.6%	0.479	84.6%***	0.362
Respondent receives pension	5.3%	0.225	4.9%	0.217	6.3%	0.244
Spouse receives pension	6.0%	0.237	4.2%	0.201	10.4%**	0.306
Net worth of respondent and spouse ²	79,892.3	125,982.7	79,605.2	124,669.8	80,628.6	129,575.0
Yearly earnings of the respondent (US\$ of 2005) ²	6,891.5	20,976.9	7,841.6	23,064.8	4,449.4**	14,025.9
Yearly earnings of the spouse (US\$ of 2005) ²	8,116.2	32,997.9	8,872.14	38,298.7	6,173.4	10,700.9
Home ownership of Respondent and spouse						
Respondent owns the dwelling, but not spouse	24.9%	0.433	25.4%	0.436	23.4%	0.424
Spouse owns the dwelling, but not respondent	30.2%	0.460	29.5%	0.456	32.1%	0.468

	All		Men		Women	
	%/mean	SE	%/mean	SE	%/mean	SE
Both own the dwelling	22.1%	0.415	20.7%	0.405	25.7%	0.438
Perceived role in household decision making						
Respondent has similar say in decision making	61.7%	0.487	62.5%	0.485	59.7%	0.492
Respondent has less say in decision making	9.9%	0.299	4.3%	0.203	23.3%***	0.424
Respondent has more say in decision making	28.4%	0.451	33.2%	0.471	17.0%***	0.376
Characteristics of Respondent's parents						
Only father is alive	19.9%	0.399	19.4%	0.396	21.3%	0.410
Only mother is alive	56.7%	0.496	58.6%	0.493	51.6%*	0.501
Mother needs assistance with basic tasks such as eating or bathing	19.9%	0.399	21.1%	0.409	16.7%	0.374
Father needs assistance with basic tasks such as eating or bathing	11.2%	0.315	10.4%	0.305	13.1%	0.338
Financial situation of mother is excellent, very good or good	13.7%	0.344	13.4%	0.341	14.5%	0.353
Financial situation of father is excellent, very good or good	4.1%	0.197	3.0%	0.171	6.8%**	0.252
Respondent's siblings						
Number if siblings alive	6.2	3.1	6.2	3.1	6.2	3.1
Respondents with siblings who provided financial support	56.7%	0.496	55.1%	0.498	60.6%	0.490
Respondents with siblings who provided personal care	22.9%	0.421	22.5%	0.418	24.0%	0.428
Respondents who agreed with siblings to share responsibilities of financial needs of parents	31.9%	0.467	32.4%	0.468	30.8%	0.463
Respondents who agreed with siblings to share	31.1%	0.463	30.6%	0.461	32.1%	0.468

	All		Men		Women	
	%/mean	SE	%/mean	SE	%/mean	SE
responsibilities of personal care needs of parents						
Observations	789		568		221	

Data: MHAS 2003

¹ MHAS reports the level of education of respondent and spouse (i.e. none, primary, middle, secondary, high school, technical school, college or more). Responded was considered to have more schooling if he or she had one or more level of education than the spouse.

² The average income of respondent, spouse and asset value is estimated over the whole study sample of married couples with at least one living parent each. This means that the average also includes zero income.

The asterisks refer to significance levels: * for $p < .05$, ** for $p < .01$, and *** for $p < .001$

The results that follow address how couples distribute their resources across each spouse's parents. For this, Table 2.2 shows couples grouped according to (i) couples who gave money, time, both or either only to the husband's parents, (ii) couples that only gave to the wife's parents, (iii) couples that gave to both sets of parents and (iv) those who did not give to either set of parents. Each of these groups is shown on the columns of Table 2.2. The rows, on the other hand, refer to the type of resource transferred. In particular, they refer to transfers of (i) money, (ii) time, (iii) money and time, as well as (iii) either money or time.

Results from Table 2.2 show that 24.6 percent of couples give money only to the husband's parents, compared to 18.8 percent who only give money to the wife's parents¹⁶, a statistically significant difference. Furthermore, wives' parents receive \$5,911.4 pesos (or US\$791.4¹⁷), compared to \$7,049.3 (US\$943.7) when only the husband's parents receive transfers, but this difference is not statistically significant. The percentage of couples that only provide time to the wife's parents (13.7 percent) is larger than that giving to only the husband (7 percent) or both (1.5 percent). Finally, Table 2.2 shows that very few households provide both time and money to either set of parents.

I now turn to wives' transfers of time or money, conditional on their husbands' decision to transfer to his parents. The results on Table 2.3 show the percentage of wives that gave money, time or neither to their parents, given the husband's decision to provide or not for his parents. Results show that the percentage of women giving money, time or nothing is similar given that husbands give money or time. The only difference is in the distribution of women's transfers when the spouse does not give to his own parents. A lower percentage of women give money, compared to women whose spouse give money or time, whereas the amount of time was larger if the spouse gives nothing to his parents. In spite of this result, it seems that wives' transfer decisions are not (at least directly) associated to their husband's decision to make a transfer.

¹⁶ The results on each row of Table 2 are not conditional on any other transfers. For example, there are 24.6 percent of couples that gave money **only** to the husband's parents independently of the wife's transfers of time to her own parents.

¹⁷ Conversion to US dollars was done dividing by 7.47. The result yields an estimate in dollars of 2005, adjusted for purchase power parity.

Table 2.2 – Households in which only husband, only wife, both or neither gave financial and/or time transfers to own parents.

	Only gave to husband's parent(s)	Only gave to wife's parent(s)	Gave to both sets of parents	Neither set of parents
Money				
Percentage of households	24.6	18.8*	26.0	30.6
Average yearly amount given in pesos	7,049.3	5,911.4	13,188.1	0.0
Observations	175	134	185	218
Time				
Percentage of households	7.0	13.7*	1.5	77.8
Observations	55	108	12	614
Both time and money				
Percentage of households	4.9	7.7*	0.8	86.6
Observations	39	61	6	683
Either time or money				
Percentage of households	21.6	23.3*	27.1	28.0
Observations	170	184	214	221

Data: MHAS 2003

** Indicates the difference between couples who only gave to husbands' parents and couples who only gave to wives' parents is statistically significant at a p-value cut-off of 0.05.*

Table 2.3 – Percentage of wives who gave money, time or did not give to their parents, conditional on their husbands transfer decision

	Husband gives to his own parents...		
	Money	Time	No transfers
Percentage of wives who give to their parent/s			
Money	51.1	49.3	37.3
Time	5.5	6.0	8.2
Nothing	43.4	44.8	54.6
Observations	362	67	405

Data: MHAS 2003

I now turn to wives' transfers of time or money, conditional on their husbands' decision to transfer to his parents. The results on Table 2.3 show the percentage of wives that gave money, time or neither to their parents, given the husband's decision to provide or not for his parents. Results show that the percentage of women giving money, time or nothing is similar given that husbands give money or time. The only difference is in the distribution

of women's transfers when the spouse does not give to his own parents. A lower percentage of women give money, compared to women whose spouse give money or time, whereas the amount of time was larger if the spouse gives nothing to his parents. In spite of this result, it seems that wives' transfer decisions are not (at least directly) associated to their husband's decision to make a transfer.

Table 2.4 and Table 2.5 show the results from the regression analysis. Table 2.4 shows the results from the regression on the likelihood of financial as well as time transfers, and the amount of money. As mentioned above, the regressions use respondents as unit of analysis, and are estimated for the entire sample, as well as for men only and women only. Unless otherwise indicated, the results reported meet standard cut-offs of statistical significance.

The likelihood of upstream financial or in-kind transfers

Regarding demographic characteristics of the respondent and spouse, Table 2.4 showed no statistical significance on being female, older or living in an urban area. The variable on years of education, on the other hand, had a negative coefficient in the regression with the entire sample, as well as the regressions for men and for women. In contrast, having at least one more level of schooling than the spouse had a positive coefficient only for men and the entire sample, but not for women.

The number of children is not statistically significant in the regression for men and the entire sample. For women however, having more children is associated with a lower likelihood of financial upstream transfers.

In Table 2.4, the variables about work and income characteristics are not statistically significant for the entire sample and for men, whereas for women, working for pay, receiving a pension, and the size of spouse's yearly earnings holds a positive and statistically significant sign. Results also show a negative association between the likelihood of upstream financial transfers and whether or not the respondent's spouse own the dwelling. This result is statistically significant for the entire sample and for men

at a p-value <0.1 . Perceiving to have more say in the family's decision making, on the other hand, has a positive coefficient in the regressions for the entire sample and for men, also at a p-value <0.1

Regarding characteristics of the respondents' parents, Table 2.4 shows that, for the entire sample and for women, respondents are more likely to make financial upstream transfers if only their mother is alive. Finally, having parent(s) who completed at least some elementary education had a positive sign only for men and in the entire sample.

The likelihood of upstream transfers of time

Table 2.4 shows that the likelihood of upstream time transfers increased if the respondent's father and mother needed help with basic tasks, such as bathing and eating. This result held in all three regression samples.

No other covariate is statistically significant for men. For women, on the other hand, the number of children had a positive sign whereas the likelihood of upstream transfers of time decreased if the husband solely owned the dwelling and if women reporting having more say in family decisions than their spouse.

The amount of upstream financial or in-kind transfers

Results from the Tobit regression on the amount of transfers are shown in Table 2.5. Results show no statistical significance for age, being female or living in an urban area. The regressions on the entire sample and on men showed a negative coefficient on the years of schooling, and a positive coefficient on having higher schooling than the spouse. For women, on the other hand, schooling had no association with the amount of upstream transfers.

The regression on the entire sample shows that employment and income characteristics of the respondent and spouse are not statistically significant. The regressions by gender provide some additional information since, among women, the coefficients on being

employed and the spouse's earning are positive, but for men the positive association with their individual labor market earnings is significant.

Table 2.5 shows that, in the regression for the entire sample, as well as the regressions by gender, the amount of upstream transfers increased if respondents had more say in family decisions. Regarding the characteristics of the respondent's parents, Table 2.5 shows that in the entire sample the amount is larger if only the mother of the respondent is alive, if the father needed assistance with basic activities and if the parent(s) had completed at least some elementary education. The analysis by gender shows that, for women, the amount of transfers declined if only the father is alive, whereas for men, the amount increases if the parent(s) completed at least some elementary education.

In summary, data shows similarities and differences in the determinants of the likelihood and amount of transfers provided by men and women. In particular, both men and women are less likely to provide financial transfers as their years of education rise, but provide larger amounts if they perceive to have more say than their spouse on family decisions. Regarding time transfers, both men and women are more likely to provide them when either parent needed assistance with basic activities.

The most relevant difference between the men and women came from the employment and earnings variables since more of them are significant for women than for men. The result that stands in both the likelihood and amount of financial transfers is that women's employment status and spouse's earnings are positive and statistically significant variables, whereas for men, only the amount of their own earnings that counted.

Table 2.4 – Probabilistic model of married/cohabiting men and women’s likelihood of giving financial or time transfers to their parent(s)

	Financial transfers						Time transfers					
	All		Women		Men		All		Women		Men	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Demographic characteristics of Respondent and spouse												
Respondent's age	0.002	0.0079	0.023	0.0245	0.001	0.0086	0.0010	0.0122	0.0060	0.0309	0.0020	0.0135
Respondent is female	0.044	0.1391					0.3130	0.2000				
Lives in an urban area	-0.125	0.1096	-0.022	0.2172	-0.207	0.1306	0.0770	0.1681	0.0070	0.2581	0.0970	0.2115
Respondent's years of education	-0.036	0.0126**	-0.058	0.0289*	-0.033	0.0145*	0.0300	0.0184	0.0690	0.0373	0.0160	0.0219
Respondent has at least one more level of schooling than spouse	0.373	0.1237**	0.135	0.2880	0.447	0.1419**	-0.2690	0.2036	-0.8000	0.4092	-0.1080	0.2415
Number of living children of respondent and/or spouse	-0.027	0.0193	-0.082	0.0393*	-0.009	0.0232	0.0350	0.0273	0.1230	0.0445**	0.0040	0.0359
One or more children under 12 years of age live in the household	-0.105	0.1016	0.276	0.2176	-0.212	0.1173	-0.2120	0.1553	0.1250	0.3132	-0.3250	0.1863
Employment and income characteristics of Respondent and Spouse												
Respondent is currently employed	0.243	0.1412	0.694	0.223**	0.059	0.1923	-0.1430	0.2064	0.0080	0.3305	-0.3550	0.2637
Respondent receives pension	0.208	0.2191	1.265	0.4460**	-0.182	0.2813	0.0540	0.2829	0.2310	0.5796	-0.3320	0.4227
Natural log of net worth of respondent and spouse	0.034	0.0239	0.068	0.0569	0.031	0.0270	-0.0280	0.0248	-0.0610	0.0596	-0.0200	0.0278
Natural log of yearly earnings of the respondent	0.016	0.0114	-0.037	0.0268	0.028	0.0133*	0.0040	0.0158	-0.0220	0.0337	0.0180	0.0183

	Financial transfers						Time transfers					
	All		Women		Men		All		Women		Men	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
(US\$ of 2005)												
Natural log of yearly earnings of the spouse (US\$ of 2005)	0.004	0.0107	0.054	0.0235*	-0.007	0.0127	-0.0200	0.0161	-0.0140	0.0343	-0.0240	0.0202
Home ownership of Respondent and spouse												
Respondent owns the dwelling, but not spouse	0.010	0.1186	-0.288	0.2378	0.066	0.1425	0.2090	0.1648	0.4140	0.3232	0.1410	0.2013
Spouse owns the dwelling, but not respondent	-0.277	0.1146*	-0.276	0.2372	-0.251	0.1349	-0.3310	0.1735	-0.7000	0.3271*	-0.2580	0.2081
Perceived role in household decision making												
Respondent has more say in decision making	0.287	0.1092**	0.418	0.2706	0.235	0.1234	-0.2900	0.1825	-1.3540	0.5974*	-0.0980	0.1962
Characteristics of Respondent's parents												
Only father is alive	-0.101	0.1482	-0.294	0.2968	-0.029	0.1808	0.2710	0.2157	0.1120	0.4071	0.2850	0.2494
Only mother is alive	0.240	0.1197*	0.540	0.2466*	0.115	0.1418	0.2730	0.2117	0.8730	0.4656	-0.0100	0.2445
Mother needs assistance with basic tasks such as eating or bathing	0.106	0.1209	0.071	0.2640	0.135	0.1395	0.9830	0.1568***	1.2450	0.3154***	0.9290	0.1948***
Father needs assistance with basic tasks such as eating or bathing	0.239	0.1689	0.050	0.3334	0.264	0.2109	1.4680	0.2064***	2.4520	0.4655***	1.1250	0.2408***
Financial situation of parent(s) is excellent, very good or good.	-0.062	0.1214	-0.332	0.2482	-0.035	0.1496	-0.1100	0.1777	0.4180	0.3565	-0.3450	0.2184
Parent(s) completed at least	0.356	0.1029***	0.152	0.2096	0.433	0.1210***	-0.0170	0.1478	0.2460	0.2915	-0.0910	0.1742

	Financial transfers						Time transfers					
	All		Women		Men		All		Women		Men	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
some elementary education												
Constant	-0.908	0.5232	-2.336	1.4256	-0.646	0.5975	-1.7860	0.7646*	-2.7840	1.8687	-1.3010	0.8639
Observations	769		215		554		769		215		554	

Data: MHAS 2003

*The asterisks refer to significance levels: * for $p < .05$, ** for $p < .01$, and *** for $p < .001$*

Table 2.5– Tobit model on the amount of financial transfers provided to parent(s)

	All		Women		Men	
	Coff.	SE	Coff.	SE	Coff.	SE
Characteristics of Respondent and spouse						
Respondent's age	0.025	0.0643	0.214	0.1814	0.007	0.0677
Respondent is female	0.248	1.1175				
Lives in an urban area	-0.380	0.8860	-0.583	1.7362	-0.313	1.0237
Respondent's years of education	-0.263	0.1036*	-0.198	0.2291	-0.304	0.1175**
Respondent has at least one more level of schooling than spouse	2.374	0.9828*	-0.093	2.1307	3.251	1.1283**
Number of living children of respondent and/or spouse	-0.327	0.1607*	-0.572	0.3085	-0.187	0.1871
One or more children under 12 years of age live in the household	-0.217	0.8227	0.330	1.7823	-0.325	0.9274
Employed and income characteristics of Respondent and Spouse						
Respondent is currently employed	1.769	1.1238	3.791	1.8389*	1.137	1.4936
Respondent receives pension	1.768	1.7448	6.164	3.2199	-0.005	2.1557
Natural log of net worth of respondent and spouse	0.222	0.1867	0.200	0.3875	0.243	0.2094
Natural log of yearly earnings of the respondent (US\$ of 2005)	0.164	0.0916	-0.282	0.2157	0.278	0.1038**
Natural log of yearly earnings of the spouse (US\$ of 2005)	0.093	0.0873	0.456	0.1840*	-0.024	0.1000
Home ownership of Respondent and spouse						
Respondent owns the dwelling, but not spouse	-0.179	0.9393	-1.949	1.8777	0.172	1.0854
Spouse owns the dwelling, but not respondent	-1.880	0.9239*	-1.753	1.8351	-1.518	1.0699
Perceived role in household decision making						
Respondent has more say in decision making	3.166	0.8420***	4.747	1.9442*	2.655	0.9329**
Characteristics of Respondent's parents						
Only father is alive	-1.897	1.2363	-5.934	2.7191*	-0.838	1.4148
Only mother is alive	1.920	0.9722*	3.535	1.8729	1.165	1.1254

	All		Women		Men	
	Coff.	SE	Coff.	SE	Coff.	SE
Mother needs assistance with basic tasks such as eating or bathing	0.404	0.9412	0.316	1.8827	0.691	1.0708
Father needs assistance with basic tasks such as eating or bathing	3.044	1.3393*	3.089	2.6585	2.921	1.5593
Financial situation of parent(s) is excellent, very good or good.	-0.067	0.9489	0.050	1.7778	-0.561	1.1238
Parent(s) completed at least some elementary education	3.156	0.8485***	1.528	1.7058	3.666	0.9815***
Constant	-9.347	4.2498*	-18.544	10.8013	-8.583	4.7260
Observations	769		215		554	

Data: MHAS 2003

*The asterisks refer to significance levels: * for $p < .05$, ** for $p < .01$, and *** for $p < .001$*

Table 2.6 provides a comparison of differences in transfers of money and/or time from working women and working men with at least one living parent. Unlike the regression analysis in which results are focused on respondents who are married or cohabiting, results shown in Table 2.6 include all respondents whose father and/or mother is alive. The purpose of this table is to provide a descriptive assessment of men and women's upstream transfer behavior before addressing the group of interest (i.e. couples). Table 2.6 shows the transfers when at least one parent is alive, only mother, only father or both parents are alive. This table aims to provide descriptive evidence regarding (i) differences in time and financial transfers by men and women employed in the labor market, and (2) differences in transfer decisions towards mothers and fathers.

Table 2.6 - Percentage and amount of financial and time upstream transfers given by working men and women

	Money		% who give time	% who give time either	% who give time both time and money
	Average amount in pesos	% who give			
If at least one parent is alive					
Employed women	7,295.5	49.2	17.0	53.4	10.6
Employed men	7,959.9	53.1	8.3	49.2	5.9
<i>Wald p-value</i>	<i>0.835</i>	<i>0.2098</i>	<i>0.000</i>	<i>0.174</i>	<i>0.002</i>
<i>Observations</i>	<i>462</i>	<i>1173</i>	<i>1299</i>	<i>1299</i>	<i>1299</i>

	Money		% who give time	% who give time either	% who give time both time and money
	Average amount in pesos	% who give			
Only mother is alive					
Employed women	6,067.3	52.5	20.3	59.0	11.9
Employed men	9,711.3	54.8	7.2	50.4	5.0
<i>Wald p-value</i>	<i>0.452</i>	<i>0.582</i>	<i>0.000</i>	<i>0.028</i>	<i>0.000</i>
<i>Observations</i>	<i>281</i>	<i>692</i>	<i>765</i>	<i>765</i>	<i>765</i>
Only father is alive					
Employed women	4,773.3	32.4	8.4	36.6	2.8
Employed men	4,205.4	48.5	11.7	47.5	7.8
<i>Wald p-value</i>	<i>0.807</i>	<i>0.025</i>	<i>0.453</i>	<i>.1199</i>	<i>0.146</i>
<i>Observations</i>	<i>71</i>	<i>229</i>	<i>250</i>	<i>250</i>	<i>250</i>
Both parents are alive					
Employed women	11,518.8	54.8	15.4	52.6	14.1
Employed men	6,398.9	53.1	8.3	48.1	6.3
<i>Wald p-value</i>	<i>0.222</i>	<i>0.804</i>	<i>0.07</i>	<i>0.499</i>	<i>0.035</i>
<i>Observations</i>	<i>110</i>	<i>252</i>	<i>284</i>	<i>284</i>	<i>284</i>

Data: MHAS 2003

Table 2.6 shows that men and women employed in the labor market are equally likely to give money to their parents if at least one of the parents is alive, and that they provide similar amounts of financial support. If only the father is alive, women are less likely to give money than if both parents are alive. However, those women who give do so in similar amounts as men. These results are consistent with those in Table 2.5. Table 2.6 shows that giving personal care (i.e. time) is more prevalent from women, even when they work. This result held when only mother, either or both parents live, but not if only father is alive. In this case, there is no statistical difference in the proportion of working women and working men who give personal care to their fathers.

Table 2.7 – Probit model on the likelihood of providing financial transfers and Tobit model on the amount of transfers after accounting for time transfers, by gender

	Likelihood of financial transfers				Amount of transfers			
	Women		Men		Women		Men	
	Coff.	SE	Coff.	SE	Coff.	SE	Coff.	SE
Respondent is currently working for pay	0.710	0.223**	0.086	0.195	3.899	1.842*	1.364	1.494
Respondent gives time to own parents	0.212	0.329	0.376	0.216	1.528	2.417	3.556	1.4972*
Respondent and parent co-reside	-0.246	0.394	-0.024	0.343	-2.986	3.380	0.399	2.731

Data: MHAS 2003

*The asterisks refer to significance levels: * for $p < .05$, ** for $p < .01$, and *** for $p < .001$*

Note: Other covariates not shown are the same as those in Table 2.4 and

I further address gender roles by estimating regressions that account for the association of transfers of time with the likelihood and amount of financial transfers provided. Results, shown in Table 2.7, refer to men and women separately. Similarly to the results above, Table 2.7 shows that women are more likely to give financial transfers when they work, and that such likelihood is independent of women providing time to their parents for personal care. For men, on the other hand, the likelihood of giving financial transfers is also independent of time transfers, whereas the amount of financial transfers is larger if men also give time transfers.

Finally, I examined the contribution of siblings' time and financial assistance to parents, as well as agreements with siblings to provide time and financial transfers. The models specified in Table 8 mirror those in Table 2.4 and Table 2.5, with the addition of siblings' contributions and agreements. Results for other covariates are similar to the ones shown above and are not repeated here.

Table 2.8 - Probit model on the likelihood of providing financial and time transfers, and Tobit model on the amount of transfers

	Likelihood of financial transfers				Likelihood of time transfers				Amount of financial transfers			
	(1)		(2)		(3)		(4)		(5)		(6)	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Respondents with siblings who provided personal care	0.325	0.132*	0.073	0.145			0.930	0.170**	2.076	0.977*	0.537	0.901
Respondents who agreed with siblings to share responsibilities of personal care needs of parents	0.384	0.109***	-0.375	0.1601*			0.429	0.196*	3.033	0.825***	-1.2	0.968
Respondents with siblings who provided financial support			1.195	0.115***	0.344	0.1896	0.099	0.1941			7.359	0.8595**
Respondents who agreed with siblings to share responsibilities of financial needs of parents			0.763	0.159***	0.483	0.169**	0.221	0.2162			3.777	0.960***
Constant	-0.993	0.533	-1.599	0.586**	-2.149	0.795**	-2.312	0.834**	-9.89	4.194*	-12.75	3.932**
Observations	769											
Censored observations									494			

Data: MHAS 2003

The asterisks refer to significance levels: * for $p < .05$, ** for $p < .01$, and *** for $p < .001$

Note: Other covariates not shown are the same as those in Table 2.4 and

An issue in addressing siblings' support to parents and agreements regarding such support is that these covariates are correlated. A respondent might agree with siblings to provide personal care (i.e. time) and agree not to give financial support instead. To assess the nature of these associations, I introduce actual and agreed time support in one set of regressions, and add actual and agreed financial support in a second set of regressions. Another relevant caveat about results in Table 2.8 is a possible endogenous relationship between the respondent's decision to transfer and the sibling-related variables. For instance, respondents might have been providers of financial resources for their parents for a period of time and decided to come to an agreement with siblings to share such responsibility. These issues can be addressed if an appropriate instrument allows observing an exogenous change in agreements with siblings or siblings' actual support. The latter has been addressed using MHAS data in Antman (2007), who defined respondents as parents and used characteristics of siblings as instruments of the likelihood of siblings transferring financial resources to their parents. In this study, such detailed information about siblings' characteristics is unavailable, so results must be interpreted with caution.

Results from Table 2.8 show that financial (time) transfers are more likely when siblings have agreed to or actually give financial (time) transfers. This also holds for the amount of upstream financial transfers. Table 2.8 also shows that these results are only observed if sibling variables for time and financial transfers are entered simultaneously in the regression. For instance, regression (1) shows that financial transfers are more likely if siblings give or agree to give personal care. Regression (2), however, shows that this result loses statistical significance when sibling variables about financial transfers are included. Equations (3)-(6) show a similar result. It is worth noting, however, that in the case of the likelihood of financial transfers, the agreements with siblings about time transfers remain significant after all sibling variables are included (see equation (2)) and that the sign of the coefficient changes.

2.5. Discussion

Results for upstream financial transfers support the bargaining power hypothesis. In short, I find that men and women who perceived to have more say in family decisions are more likely to make upstream transfers of money. For women, working for pay and receiving a pension increased their likelihood of financial transfers, whereas the likelihood is lower if the husband is the sole owner of the dwelling. For men, on the other hand, having more schooling than the spouse increased the likelihood of financial transfers.

The relationship between financial transfers and the earnings of respondents and the earnings of their spouse is different men and women. Results show that for women, financial upstream transfers are more likely when their spouse's income is larger, while for men they are more likely if their own individual income is larger. This may indicate that, for women, the decision to transfer is a function of the total household income, whereas for men it is their share of the income what drives the decision.

Results for upstream time transfers show that, if husbands own the dwelling, women are less likely to give time transfers, a result also observed for financial transfers. One could conclude that having lower bargaining power decreases the likelihood of time transfers, but, unlike financial transfers, the opposite is not true. Results for financial transfers showed that if women perceive they have more say than their husband in family decisions (hence more bargaining power), women would be more likely to transfer money. This is not the case with time since the likelihood of transfers of time is lower for women who perceive they have more say than the spouse. It is possible that perception of how much say a woman has relative to their spouse is also indicating the responsibilities she carries in the household. For instance, women who have more say than their spouse may perceive so because they are responsible for grandchildren or care for their spouse. Women under these circumstances will have less time available to devote to their parents and compensate by providing financial resources instead.

Regarding gender differences and competing roles, women's decisions about transfers of time are related to traditional roles as caregivers. For instance, women who have more children are more likely to provide time to their parents. Given that respondents are 50 and older and their children are, on average, 20.7 years of age, it is possible that, once children are grown, women can spend more time with their own parents and may even rely on their own children to address household chores. This is not an issue for men for whom the number of children has no association with transfers of time.

Results also showed that men and women are as likely to transfer money regardless of their decision to transfer time. The amount of transfers, however, was larger among men when they also transferred time, indicating that for men time and money were not merely substitutes. This differs from the pattern observed for women, raising questions about potential differences between men and women's motivations and decision making regarding upstream transfers. For instance, theories on transfer motives would suggest that children who spend more time with their parents may do so out of altruistic interest (i.e. improve the parent's well being) or out of exchange or bequest motives. This would suggest that the analysis of transfer motives could look into differences in motivations between husbands and wives.

While for men the parent's gender does not play a role in their transfer decisions, women favor their mothers. Furthermore, women are more likely to transfer money if only the mother is alive and the amount provided is smaller if only the father is alive.

The health of the parents had a strong statistical significance as determinant of time transfers for men and women, a result not entirely surprising given that respondents' parents are likely to be among the oldest and time transfers refer specifically to assistance with activities such as eating and bathing.

Results about siblings' role on transfer decisions showed that respondents are more likely to transfer money or time if siblings provide or have agreed to provide money or time. The result about siblings' actual transfers indicates that respondents and siblings' transfers are complementary insofar as having one sibling giving transfers increases the likelihood of an

individual to do the same. This holds even after accounting for agreements to share responsibility for parents' needs. Such agreements seemed to work instead as an incentive to transfer, regardless of the siblings' actual transfer decisions.

There is some evidence that the likelihood of financial transfers is lower when there are agreements about time transfers. This result may speak to prior work that hypothesizes that less well off siblings tend to provide time and better off siblings tend to provide money. Given the lack of information about siblings' socioeconomic status, this cannot be tested in this chapter.

In addition to limited information regarding siblings, this analysis faces other limitations. First, the sample size was relatively small, which prevents analyses of other relevant subgroups. For instance, bargaining power and gender roles may have a different relationship with upstream transfers from men and women in urban compared to rural areas. Second, after MHAS was collected, the Mexican government initiated financial policies targeting older adults. Such policies may have altered how children and spouses make decisions about caring of their oldest parent. This study would provide relevant information once these programs have been in place for some time. Finally, the data in MHAS did not distinguish between frequent and occasional gifts. This distinction is relevant insofar as the first may correspond to assistance with basic consumption needs, whereas the second may occur in response to life shocks or be a seasonal event.

The result that financial transfers from women are more likely when the spouse's income is larger deserves further study. This result holds even after accounting for women's work status and individual earnings and sheds light on potential differences in consumption preferences. For instance, it is possible that women account for their parents' consumption as part of the joint family budget, whereas men only consider transfers of money to their parents when their own earnings reach a certain threshold. Such differences in the composition of men and women's preferences are relevant in determining policies that target the income security of older adults involving children.

Finally, results from this chapter indicate that policies that aim at improving the quality of life of the oldest old ought to take into account the safety net that children provide. Since such safety net creates great opportunity costs for children, particularly for women, policies that take into account children's resource availability can help children and their families minimize the opportunity cost of providing financial resources and care, and improve the quality of life of the oldest old.

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Appendix 2.1

Table 2.9 - Tobit estimates on the Natural Logarithm of the Amount of Upstream Transfers of Money, conditional on giving money

	ALL		WOMEN		MEN	
	b	se	b	se	b	se
Respondent's age	0.026	0.0399	0.179	0.1132	0.013	0.0429
Respondent is female	-0.214	0.6752				
Lives in an urban area	0.457	0.5516	-0.773	1.0546	0.876	0.6385
Respondent's years of education	-0.011	0.0665	0.228	0.1445	-0.064	0.0764
Respondent has at least one more level of schooling than spouse	-0.093	0.6097	-0.743	1.2078	0.315	0.7115
Number of children of R/S 2003 =1 if k<12 yoa live in hh	-0.17	0.1019	-0.048	0.1792	-0.156	0.122
Respondent is currently employed	0.22	0.679	-0.464	1.1141	0.658	0.9287
Respondent receives pension	0.357	1.0361	-0.977	1.7957	0.858	1.363
Natural log of net worth of respondent and spouse	0.021	0.1175	-0.334	0.2622	0.077	0.1315
Natural log of yearly earnings of the respondent (US\$ of 2005)	0.069	0.0544	0.167	0.111	0.026	0.0624
Natural log of yearly earnings of the spouse (US\$ of 2005)	0.066	0.0571	-0.012	0.141	0.102	0.0648
Respondent owns the dwelling, but not spouse	-0.278	0.5659	-0.582	1.1137	-0.204	0.6644
Spouse owns the dwelling, but not respondent	-0.007	0.5944	-0.077	1.1714	0.262	0.7017
Respondent has more say in decision making	1.497	0.5034**	3.461	1.1382**	1.269	0.5680*
Only father of respondent is alive	-1.428	0.8	-3.978	1.7469*	-0.991	0.8962
Only mother of respondent is alive	0.321	0.614	1.07	1.2135	0.229	0.7099
Mother needs assistance with basic tasks such as eating or bathing	-0.174	0.5625	-0.788	1.1178	-0.005	0.6443
Father needs assistance with basic tasks such as eating or bathing	1.443	0.8372	3.5	1.8252	1.205	0.9479
Financial situation of parent(s) is excellent, very good or good.	0.228	0.5864	2.358	1.0964*	-0.481	0.6866
Parent(s) completed at least some elementary education	1.031	0.5465	1.216	1.0922	1.003	0.6449
Constant	2.754	2.6446	-2.986	6.8568	2.094	2.9612
N	350		88		262	

Data: MHAS 2003

Table 2.10 - Ordinary Least Squares on the Natural Logarithm of the Amount of Upstream Transfers of Money, conditional on giving money

	ALL		WOMEN		MEN	
	b	se	b	se	b	se
Respondent's age	0.023	0.0326	0.133	0.0993	0.014	0.0357
Respondent is female	-0.187	0.5474				
Lives in an urban area	0.39	0.4473	-0.437	0.929	0.683	0.5264
Respondent's years of education	0.001	0.0539	0.185	0.1277	-0.038	0.0626
Respondent has at least one more level of schooling than spouse	-0.14	0.4945	-0.482	1.0775	0.13	0.5844
Number of children of R/S 2003 =1 if k<12 yoa live in hh	-0.143	0.0824	-0.041	0.1585	-0.138	0.1
Respondent is currently employed	0.137	0.5507	-0.281	0.9771	0.411	0.7637
Respondent receives pension	0.246	0.8489	-0.758	1.5985	0.627	1.1379
Natural log of net worth of respondent and spouse	0.029	0.0952	-0.248	0.2349	0.073	0.1075
Natural log of yearly earnings of the respondent (US\$ of 2005)	0.052	0.0441	0.12	0.0978	0.02	0.0514
Natural log of yearly earnings of the spouse (US\$ of 2005)	0.048	0.0465	-0.007	0.1251	0.072	0.0534
Respondent owns the dwelling, but not spouse	-0.201	0.4606	-0.47	0.9857	-0.146	0.5489
Spouse owns the dwelling, but not respondent	-0.011	0.4837	-0.044	1.0227	0.207	0.5801
Respondent has more say in decision making	1.219	0.4111**	2.73	1.0133**	1.038	0.4704*
Only father of respondent is alive	-1.145	0.648	-2.795	1.4918	-0.868	0.7407
Only mother of respondent is alive	0.263	0.4991	0.81	1.0835	0.189	0.5854
Mother needs assistance with basic tasks such as eating or bathing	-0.07	0.4571	-0.454	0.9813	0.046	0.5312
Father needs assistance with basic tasks such as eating or bathing	1.074	0.6833	2.43	1.6101	0.918	0.7865
Financial situation of parent(s) is excellent, very good or good.	0.154	0.4796	1.814	0.9837	-0.38	0.5674
Parent(s) completed at least some elementary education	0.874	0.4424*	0.974	0.9565	0.859	0.5305
Constant	3.538	2.1596	-0.525	6.0787	3.109	2.452
N	350		88		262	

Data: MHAS 2003

Chapter 3: Evaluation of the effect of Mexico's conditional cash transfer program on private transfers

3.1. Introduction

Current research provides no evidence about the role of government conditional cash transfer programs in beneficiaries receiving or providing financial or in-kind private transfers in urban areas. Conditional cash transfer programs are quickly expanding in the developing world given their perceived effectiveness to meet diverse anti-poverty goals. As the name suggests, these programs provide cash to individuals or households in need, conditional on them meeting milestones associated to the goals of the program. In this paper, I use data available from Mexico's conditional cash transfer program, also known as Oportunidades, to assess the effect of the program on the likelihood and the amount of transfers of money or in-kind that households give and receive from other family members and friends.

Mexico's Oportunidades program is one of the first and largest cash transfer programs currently in place. Even though the focus of this study is urban households, the program serves households in both urban and rural areas that live under poverty. Currently, Oportunidades registers over 5.5 million families and its cash transfers represent, on average, 25 percent of beneficiaries' monthly earnings.

From a policy standpoint, the interest in this issue is twofold. First, private transfers to households may constitute an informal form of consumption insurance that is "crowded out" by the program. In such case, beneficiaries would be as well or worse off than before the program. Second, beneficiaries may decide to use the program's resources to meet the needs of individuals living outside the dwelling. In such case, the effectiveness of the program is compromised and new strategies would have to be set in place.

This chapter's aim is to address the effect of cash transfer programs on private transfers of financial or in-kind resources received or provided by urban households living under poverty. Here, giving and receiving private transfers are separate outcomes, and results show the program's effect on the likelihood of transfers given or received, as well as the amount given or received.

The analysis uses data from the Urban Evaluation Survey (ENCELURB for its Spanish name). These data provide longitudinal information and a quasi-experimental design that facilitates estimation of program effects. The data here corresponds to ENCELURB 2002 and 2003 (baseline and first follow up). Difference in difference estimates show the program effect for the outcomes described above. Given the quasi-experimental nature of the data, results are likely to yield biased estimates. Propensity score matching techniques are used to address this issue. Results show that the Oportunidades program does not crowd out any of the outcomes of interest.

This chapter is organized as follows. The second part introduces an overview of the literature on intra-family transfers and empirical evidence about crowding out due to cash transfer programs. The third section outlines the methodology, while the fourth section explains the result, and the final section concludes.

3.2. Literature review

Economists hypothesize that family members who decide to transfer resources among themselves may do so out of altruism or in expectation of receiving something in exchange (i.e. inheritance, gifts, time) (Cox 1987; Altonji and Hayashi 1993; Cigno 1993; Altonji, Hayashi et al. 1997; Cox, Eser et al. 1998; Arrondel and Masson 2001; Cox 2002; Cox 2003; MacDonald and Koh 2003; Cox, Galasso et al. 2005; Arrondel and Masson 2006; Kazianga 2006; Cox and Fafchamps 2007). Other authors have concluded that households may do so because values that determine transfer patterns are transmitted (demonstrated) across generations, leading to repeated patterns of provision of resources among family members (Laferrere and Wolff 2006).

One of the key conclusions of the altruistic model of transfers is that altruistic donors will provide transfers when the income of the recipients declines and cease to do so when the income of the recipient rises, so that family transfers constitute a perfect form of insurance for the recipient. Therefore, any exogenous increase in recipient's income will cause a proportional decrease in transfers. This observation has been dubbed crowding out, insofar as each dollar of exogenous income increase results in a one dollar decrease in private transfers.

In the exchange model, donors expect something in return. For instance, donors may provide money in exchange for services or time. However, if recipients become wealthier, donors may have to compensate with more money in exchange for their services. The extent of the donor's need for such services determines whether and how much donors are willing to pay for those services.

Empirical work about crowd out has assessed transfer motives by researching the income derivatives, which refer to changes in transfers due to changes in income of the donor and changes in income of the recipient of family transfers. The altruism and impure altruism models have shown that the difference between the income derivatives should equal one to support the altruism hypothesis (Becker 1974; Cox 1987). Research addressing income derivatives shows that, in wealthier countries, family members are mostly driven by exchange or other motives, whereas in less wealthy countries low income groups tend to behave altruistically. For instance, Altonji, Hayashi and Kotlikoff (1997) find that donors do not take away one dollar of family transfers for each dollar the recipient's income rises. Instead, they withdraw between 0.054 and 0.123 cents per dollar increase.

Cox, Hansen and Jimenez (2004) argue that the extent to which government policies may reduce altruistic behavior, particularly long term transfer behavior, might partly depend on how acclimated individuals are to the idea that they may count on public programs' assistance. If individuals know such programs exist they may account for them when optimally deciding on their own and their family members' consumption bundle (which

includes transfers). The author's overview of the Philippine social security and welfare system shows that it does not cover a large proportion of the population; therefore, it is feasible that transfers are more responsive to exogenous changes in income of the recipient. They show that low income donors reduce transfers by 0.4 cents for every unit of increase in recipient's income – consistent with the altruism hypothesis – whereas among higher income donors, there was a decline of 0.03 cents. Similar results have been found in Chinese data: low income donors decrease transfers between 0.52 and 0.68 cents per unit of increase in recipient's income, whereas higher income donors decreased transfers by 0.16 to 0.20 cents (Cai, Giles et al. 2006).

From a policy perspective, crowding out is a concern to public cash transfers targeting low income households. In recent years, great efforts have taken place in several developing countries, such as Colombia, Mexico, Nicaragua and Turkey, to implement conditional cash transfer programs. Such programs provide cash to families contingent on behaviors towards improving human capital and preventing the intergenerational continuity of poverty (Rawlings and Rubio 2005).

Conditional cash transfer programs have been subject to systematic evaluations, which provide data to assess program effectiveness on a wide range of outcomes. In the case of Mexico, studies have used data from the Progresa program for rural households (currently known as Oportunidades). Such studies use data from the Household Socioeconomic Characteristics Survey (ENCASEH) and Household Evaluation Surveys (ENCEL) (Attanasio and Rios-Rull 2000; Teruel and Davis 2000; Albarran and Attanasio 2003).

Albarran and Attanasio (2002) use the October 1998 wave of ENCEL and find that the program's cash "transfers can expand the budget by 15 percent to 30 percent and help to buy over one third of the food consumed in the household" (Albarran and Attanasio, 2002; p. 12). They also find that the program has a crowding out effect on both the likelihood and the amount of private transfers and that the crowding out effect is smaller for transfers received from family members who have left the household. Rios-Rull and

Attanasio (2000) also use data from the 1998 ENCEL with results showing weak evidence of crowding out on the likelihood of receiving and the amount of private transfers.

In a similar study, Teruel and Davis (2000) overcome issues with potential baseline imbalances by using the October 1998 and November 1999 waves of ENCEL. The authors address two research questions. First, whether participation in the program influences the probability of receiving or giving a transfer, and second, if a household is receiving transfers, how does participating in the program affect the amount. The authors' descriptive assessment showed a drop in the incidence of non-monetary transfers. Their difference in difference estimates, however, shows that this drop was not statistically significant (Teruel and Davis 2000), hence their conclusion was that Progresa was not crowding out private transfers.

A more recent evaluation studies the cases of Nicaragua and Honduras (Nielsen and Olinto 2007). In particular, Nielsen and Olinto examine whether the conditional cash transfer programs to rural households crowded out private remittances and food transfers, as well as money and food transfers from non-governmental organizations. The study uses longitudinal data available for both programs, and found crowding out on food and non-governmental transfers.

In short, in spite of a rich literature assessing transfer motives, the research about the crowd-out effect of conditional cash transfer programs has been limited to a few countries (mainly Mexico) and has focused on rural households. This literature reveals mixed evidence. While studies using a semi-experimental design on one wave of data show some evidence of crowd-out, longitudinal studies show no crowd out of the likelihood of receiving private transfers, but some weak evidence of crowding out the amount of transfers.

Overview of the Oportunidades program

The Oportunidades program is a public cash transfers program created to assist the educational, health and nutritional needs of low income Mexicans. The program originally was known as Progresa, and served only residents of rural areas. In 2001, it was expanded to also include families from urban and semi-urban areas, at which point it became known as Oportunidades. As a result of the expansion, the number of families enrolled in the program went from 2.6 million in 1999, or 40 percent of all rural families, to 5 million by mid 2005 (Molyneux 2006). This number has only changed slightly over time and currently includes over 5.5 million families (Neufeld, Steta et al. 2011). The program's coverage currently includes all 32 states (Neufeld, Steta et al. 2011) and is financed by the federal budget. As of 2004, Oportunidades cost was USD \$2.2 billion dollars, or 0.3 percent of Mexico's Gross National Product (Nigenda and González-Robledo 2005). It is worth pointing that only 17 states were part of the urban Oportunidades¹⁸ (SEDESOL 2005).

The program is built on the principle of co-responsibility. Specifically, recipients are required to work with the program staff to meet the expected goals. To meet educational goals, families are required to enroll children in school and make sure they attend. The program's cash transfer reflects the number of children in school, with higher amounts provided for girls as they reach higher grades. Beneficiaries are also required to register in government health centers, receive monthly health education sessions, and use benefits to improve children's nutrition and school performance (Nigenda and González-Robledo 2005). The amount of the cash transfer is largely dependent on the number of boys and girls attending to school. For instance, in 2002, a family could receive a maximum of \$890 pesos if none of the family members were enrolled in high school and up to \$1,510 if there were family members enrolled. These amounts were also dependent upon the number of boys and girls enrolled in school. For instance, if a boy was enrolled in third year of high school, the family would receive \$540 pesos on a monthly basis and \$620 if a girl was enrolled (Prado and Ávila 2003). The amount of transfers from Oportunidades

¹⁸ The states included were Campeche, Colima, Chiapas, Guanajuato, Guerrero, Hidalgo, México (excluding México City), Michoacán, Morelos, Puebla, San Luis Potosí, Sinaloa, Sonora, Tabasco, Tamaulipas, Tlaxcala, and Veracruz

a household can receive may represent an important part of total household income. For instance, according to ENCELURB data of 2002, poor households spent an average of \$1,187 pesos a month in food and had earnings of \$3,718 pesos a month. Furthermore, recent research suggests that on average the cash transfer composes 25 percent of a household's income (Behrman and Parker 2011).

The effectiveness of the Oportunidades program has been documented on several outcomes. For instance, results from evaluations of the program show a reduction of 45 percent in the poverty severity indicator¹⁹. Regarding education, as of 2004, high school drop-out rates had decreased 17 percent in rural areas and nearly 7 percent in urban areas. Health outcomes also have shown improvements; for instance, the program has resulted in an 11 percent decrease in maternal mortality among participants, and lower incidence of disease among children under 5 years of age enrolled in the program (Nigenda and González-Robledo 2005)

3.3. Data and Methods

a. Data

In this chapter, data comes from Oportunidades' Urban Evaluation Survey (ENCELURB), a longitudinal data set collected to evaluate the Oportunidades' outcomes. The survey collected information in 2002, 2003 and 2004. This chapter uses information from the first two waves.

The evaluation of the Oportunidades' (as well as Progresas') effectiveness has relied on a semi-experimental design, in which communities or areas are assigned to receive the program immediately, while others are set to receive it at a later time. So far, all evaluations regarding crowding out have used rural data, which relied on randomly

¹⁹ Roughly speaking, the severity of the poverty index captures the extent of the depth of poverty. The depth of poverty, in turn measures the poverty gap, or distance between income and the poverty line (see Alkire and Foster (2011) for a recent discussion of poverty measurement). As described above, as well as by Albarran and Attanasio (2002) families with children in school years received larger amounts of money from the Oportunidades program. Even though providing income is not the core goal of the program, the cash incentive allowed decreasing the depth and, therefore, the severity of poverty.

assigned treatment and control villages. The design and collection of the ENCELURB data set, however, followed a somewhat different process. The specifics about the implementation of the program and the design of the evaluation component are relevant to understanding the analytical strategies to assess program-related outcomes.

In their implementation, Progresa and Oportunidades had geographic areas pre-selected based on area-level indicators of deprivation. In the evaluation of the Progresa program (i.e. rural), 506 villages were selected and randomized in two groups. The treatment villages began receiving the cash transfer in 1998 and the control villages did not receive cash transfers until 2000. Almost all households that were classified as poor based on a census²⁰ eventually became part of the program.

In Oportunidades, in order to identify program eligibility, all of the country's households were classified as either poor or non-poor based on information from the 2000 Census. This data was then grouped in "manzanas" or blocks. These blocks were then used to build "zonas" or clusters. Clusters with 500 or more poor households were eligible for the program. The Oportunidades advisory group used these the blocks as the basis for the design of the evaluation of the program.

The evaluation of urban Oportunidades faced two challenges. First, there was no random assignment of treatment and control localities. The evaluation design involved selecting blocks to receive treatment immediately after the baseline survey. 149 blocks were selected for immediate treatment. The advisory group decided to include with certainty all blocks with 50 or more households classified as poor, and excluded blocks without eligible households. The intervention blocks would later be matched to similar blocks using a propensity score approach (SEDESOL 2005) to provide a control group. The households in the control blocks would start the program one year after the ones in treatment blocks.

²⁰ The Rural Household Socioeconomic Characteristics Survey, or ENCASEH for its name in Spanish, was a census of all households in villages previously selected as eligible for the program. The ENCASEH data determined each household's eligibility prior to program enrollment

The second challenge of the program evaluation was low participation rates. Fewer than half of potentially eligible households were enrolled a year after its implementation, which may be partly explained by the enrollment process. Unlike Progresa, enrollment was not brought door to door. Instead, information about the program was publicized so potential beneficiaries would come to registration offices for an interview to determine preliminary eligibility, followed by an official visit to the household that would determine final eligibility (SEDESOL 2005).

A census was collected from the treatment and matched control blocks allowing the classification of households as poor, quasi-poor or non-poor. A sub-sample of treatment and control areas was selected for the Urban Evaluation Survey (ENCELURB for its Spanish name). A predetermined number of poor, quasi-poor and non-poor households were selected in control areas. In treatment areas, the sampling also targeted similar groups, as well as eligible households, including those that had registered in the program and those that had not done so. However, given the low number of households enrolled, this target was not met. As a result, the sample was expanded to include blocks neighboring the treatment blocks to meet the target sample size (SEDESOL 2005; Angelucci and Attanasio 2006) .

Sample size and variables of interest

The 2002 and 2003 waves collected information about 16,008 households – of which 9,934 were poor. For the analyses presented in this chapter, I use only information from households classified as poor. Among poor households in 2002, 6,306 (63.4 percent) lived in treatment areas and 3,628 (36.5 percent) lived in control areas.

Table 3.1 shows the sample size for each outcome of interest in the treatment and control areas. After accounting for missing observations, the final sample of households that responded to the questions about giving financial or in-kind transfers is 9,920. In contrast, 6,199 households responded to the questions about receiving financial or in-kind transfers. The reason for missing responses (most of them at baseline) about receiving

financial or in-kind transfers is unclear.. It is possible that respondents were concerned about their current or potential participation in the program and thus refused to respond.

Table 3.1 – Sample size per outcome

	Control	Treatment	Total
Receiving transfers	1,306	4,893	6,199
Amount received	304	1,205	1,509
Giving transfers	3,625	6,295	9920
Amount given	106	322	428

Data: ENCELURB 2002, 2003

According to Oportunidades administrative data, 42 percent of all eligible households participated in the program (Angelucci and Attanasio 2009). In treatment areas, 64.4 percent (n=4,086) were enrolled. Attrition was not a problem in this sample, at least not among poor households. Only 11 households classified as poor at baseline left the study in 2003. However, if the whole sample is taken into account, the attrition rate is 6.9 percent. This finding is consistent with other authors, who determined that, for the whole Oportunidades urban sample, the attrition rate was about 8 percent as of 2004 independently of assignment to treatment or control areas (Angelucci and Attanasio 2009).

Outcome variables

This chapter assesses the crowd-out of financial or in-kind transfers given and received by households. The process of giving or receiving transfers has two parts: the *likelihood* of giving or receiving financial or in-kind transfers, and the *amount* given or received. ENCELURB collected information about private transfers across all waves and each household reported if it had given or received money or in-kind transfers to (from) a friend or family member who lives out of the dwelling²¹. Regarding the amount, it is reported in pesos for the 12 months prior to the survey^{22,23}.

²¹ Roughly translated, ENCELURB asked: During the past 12 months, has any person living in this household received money from a relative, neighbor or friend who does not live in this dwelling? The question was similar for in-kind transfers.

²² For monetary transfers, ENCELURB asked: During the past 12 months, in total, how much money has (DONOR) sent you? For in-kind transfers, the question was: About how much is it that(DONOR) has given you in the past 12 months?

This chapter estimates treatment effects for all poor households involved in giving or receiving transfers. Furthermore, it also includes treatment effects for households with at least one resident 50 and older, since transfers to older adults may be less responsive to a program whose target are mostly children. In addition to this subgroup, the results section also shows treatment effects on households where females were head of households, given that the Oportunidades program provides the cash transfer almost uniquely to women. Therefore, if the program crowds-out transfers, it is more likely to take place among the recipients of the cash transfer from Oportunidades.

b. Methodological approach

I evaluate the effect of the Oportunidades program on the likelihood and amount of private transfers given and received using a Difference in Difference (DID) estimator. As mentioned above, there are two main concerns regarding the evaluation of Oportunidades, its low participation rate and the non-random assignment of treatment and control areas. These issues have been discussed to a larger extent by Angelucci and Attanasio (2006, 2006, 2009), who analyze the estimation of treatment effects of consumption using different comparison groups available in ENCELURB to address the non-compliance problem, as well as propensity score matching as means to address non-random assignment. The discussion below relies on their methodological discussion insofar as it directly relates to the program in question, as well as on other relevant literature (Angelucci and Attanasio 2006; Angelucci and Attanasio 2006; Angelucci and Attanasio 2009).

The DID estimators

Conceptually, the effect of interest is the effect of treatment on the treated, which implies comparing the outcome in the treated state (Y_1) with the outcome in the untreated state

²³ I right censored the amount of transfers at a maximum of \$24,000 pesos a year in households that reported receiving more than \$100,000 pesos a year. This resulted in 10 censored observations from baseline. This means that these 10 observations were coded as receiving \$24,000 pesos a year. The decision to set the threshold at \$24,000 was to keep 99% of the observations unchanged.

(Y_0), conditional on receiving treatment (Diaz and Handa, 2002). In other words, it implies comparing the treated when receiving treatment and when not receiving it (i.e. counterfactual).

The Difference in Difference estimator (DID) used here, allows comparing the treatment effect in terms of the difference in changes over time with and without treatment.

Formally:

$$(12) \text{ ATT} = E[\Delta Y_1 - \Delta Y_0 \mid D = 1] = E[Y_{1,t=1} - Y_{1,t=0} \mid D = 1] - E[Y_{0,t=1} - Y_{0,t=0} \mid D = 1]$$

Here, ATT refers to the Average Treatment effect on the Treated, $D=1$ indicates receiving treatment. The subscript $t=0$ in the initial period, and $t=1$ in the period following treatment. The second component, $E[Y_{0,t=1} - Y_{0,t=0} \mid D = 1]$, is also known as the counterfactual and represents the potential outcome of the treated if they had never received any treatment. Households²⁴ receiving treatment, however, cannot be observed not receiving treatment. Under an experimental design, groups can be randomly assigned to treatment and control groups, but not here. For both groups to be comparable, and estimates identified, there are two standard assumptions:

- The Stable Unit Treatment Value Assumption (SUTVA), which states that potential outcomes (Y_1 and Y_0) are independent of the treatment status of others, which implies no general equilibrium effects.
- The Conditional Independence Assumption (CIA) requires that, conditional on a set of covariates X , the expected value of unobservable attributes does not differ between treated and non treated groups.

These assumptions imply that we can use households in the control group as a counterfactual, meaning that $E[\Delta Y_0^T \mid D = 1, X] = E[\Delta Y_0^C \mid D = 0, X]$. The notation here includes two superscripts to indicate assignment to treatment (T) and control groups (C).

²⁴ The presentation of the DID uses households as the unit receiving treatment as this is the case in Oportunidades.

The equality shows that, given the aforementioned assumptions, we can now use households in the control group as our counterfactual. The ATT can be now expressed as:

$$(13) \text{ ATT} = E[Y_{t=1}^T - Y_{t=0}^T | D = 1, X] - E[Y_{t=1}^C - Y_{t=0}^C | D = 0, X]$$

Ideally, all households assigned to treatment and control would comply: treatment group households would receive treatment (indicated by D=1), and those in the control group would not (D=0) (or would receive it after follow up data has been gathered, as it was done in ENCELURB). In this context, a household²⁵ is compliant if, when in a treatment area, it enrolls for the program. A household is also compliant if, when in a control area, it does not enroll in the program. However, households do not always comply. Table 3.2 summarizes the definitions of compliers and non-compliers in treatment and control areas. For notation purposes, let Z =1 be the area assigned to treatment, and Z=0 the area assigned to control. If all households complied, all eligible participants in Z=1 would also be in the D=1 category.

Table 3.2 – Definition of compliers and non-compliers in treatment and control are

	Treatment area (Z=1)	Control area (Z=0)
Enrolled in Oportunidades (D=1)	Complier	Non-complier
Not enrolled in Oportunidades (D=0)	Non-complier	Complier

From the description above of Oportunidades’ challenges during its initial enrollment, we know not all eligible households in treatment areas enrolled (i.e. not all complied). For equation (13) to be identified, it must be true that, given X, “the expected value of the change in the variable of interest for the control group is the same as the change for compliers in the absence of the program” (Angelucci and Attanasio, 2006: 9). Notice that, under this identification assumption we should be able to compare across compliers in treatment and control areas, given X. For a more explicit notation that also includes assigned area (Z), equation (13) can be expressed as:

$$\text{ATT} = E[Y_{t=1}^T - Y_{t=0}^T | D = 1, Z = 1, X] - E[Y_{t=1}^C - Y_{t=0}^C | D = 0, Z = 0, X].$$

²⁵ For simplicity, assume all households in treatment and control areas are eligible for the program.

Another group for comparison to estimate the ATT is between the compliers and non-compliers in treatment areas. In such case, the ATT can be written as:

$$(14) \text{ ATT} = E[Y_{t=1}^T - Y_{t=0}^T | D = 1, Z = 1, X] - E[Y_{t=1}^C - Y_{t=0}^C | D = 0, Z = 1, X]$$

For equation (14) to be identified, the assumption of no general equilibrium effects must also hold within treatment and control areas implying that outcomes in non-compliers are not affected by compliers' decisions.

An alternative to the ATT is to estimate the Average Intent to Treat (AIT) which compares treatment and control groups regardless of participation status. In other words, the AIT is an estimate of the effect of the treatment on all eligible households:

$$(15) \text{ AIT} = E[Y_{t=1}^T - Y_{t=0}^T | Z = 1, X] - E[Y_{t=1}^C - Y_{t=0}^C | Z = 0, X]$$

Under the assumptions mentioned above, the AIT would equal the ATT should there be complete compliance, whereas in the absence of full compliance the AIT would provide a lower bound of the ATT.

It is worth pointing that, for identification, both the ATT and AIT need the two assumptions described above (SUTVA and CIA). In ATT, however, there are different options for comparison groups (i.e. compliers in treatment vs. control groups and compliers vs. non-compliers in treatment areas) so identification assumptions may become stronger as they apply to each of them.

An alternative to these estimators is shown by Angelucci and Attanasio (2006, 2006, 2009). The authors propose estimating a Local Average Treatment Effect (LATE). The LATE provides the average effect of treatment given by an instrumental variable. In this case, the authors propose using the type of area of residence (treatment or control) as an

instrumental variable insofar it is not correlated with participation, and could be conditionally uncorrelated with the outcome. The proposed estimator is given by:

$$(16) \text{ LATE} = \frac{E[Y_{t=1}^T - Y_{t=0}^T | Z = 1, X] - E[Y_{t=1}^C - Y_{t=0}^C | Z = 0, X]}{E[D = 1 | Z = 1, X]}$$

Two additional assumptions are necessary for identification. First, in the absence of the program, the outcome is not affected by area of residence, given a set of observables. Second, the area of residence does not affect the likelihood of program participation and third, households in control areas would not be part of the program, but would if they resided in the treatment area.

Notice that, in equation (16), the LATE is the ratio of the AIT over the proportion of compliers in treatment areas. If AIT is, in fact, a lower bound estimate of the ATT because it averages the effect across all households, dividing over the participation rate would provide a closer estimate of the ATT.

Propensity score matching

The discussion above regarding the control group as counterfactual implied that the expected value of the difference in outcome, had the treatment group not received any treatment, is equal to the difference in outcome in the control group, which did not receive treatment, *conditional on a vector X of observable characteristics*. This is derived from the means independence (or balancing) assumption of Rosenbaum and Rubin (1984). The authors showed that, given a vector of covariates X, the mean outcome of non-beneficiaries (i.e., households in the control group) is the same (and has the same distribution) as beneficiaries if they had not participated in the program (Rosenbaum and Rubin 1984; Heckman, Ichimura et al. 1998) .

Formally, using the authors' notation let Y_0 be the outcome of those non-treated. In such case, mean independence exists if $(Y_0 \perp D | X)$. This means that the outcome when no treatment is received is unrelated to group assignment, given a vector X of observables.

Rosenbaum and Rubin (1984) also showed that, if this holds, then it is also true that $(Y_0) \perp D \mid P(X)$, where $P(X) = P(D = 1 \mid X)$. This means that a comparison between two groups can be done using a single score given by the probability of being in the treatment group, conditional on X . This score is known as the propensity score. In other words, the propensity score eliminates having to match on as many dimensions as given by vector X , and, instead, it allows matching on a single score or indicator given by $P(X)$.

The matching that allows the comparison between participants and non participants can only take place over the area on which the propensity scores distribution for those in the participant and non participant groups overlap. This is known as the area of common support. Heckman, Ichimura and Todd (1998) show that, under certain conditions²⁶, this estimator can be justified in a difference in difference estimator, so equation (13) becomes: $ATT = E[Y_{t=1}^T - Y_{t=0}^T \mid D=1, P(X)] - E[Y_{t=1}^C - Y_{t=0}^C \mid D=0, P(X)]$ (Heckman, Ichimura et al. 1998). Notice that, now, the comparison of the expected difference is conditional on the single-dimension propensity score. A similar rationale applies to equations (14) to (16).

I estimate the propensity scores taking into account the groups of comparison. In particular, results are presented using the following propensity scores:

- The probability of being in the treatment area, or $P(Z=1 \mid X)$, which I use in the estimation of the AIT and LATE (see Equation (4)).
- The probability of being a complier, or $P(V=1 \mid X)$, where $V=1$ for households that enrolled and are in the treatment area, and 0 if did not enroll and live in control areas (see Equation (2)).
- The probability of being a complier in the treatment area, or $P(D=1 \mid Z=1, X)$ (see Equation (3)), 0 if did not enroll and live in treatment area.

²⁶ Heckman, Ichimura and Todd (1997) define the outcome in the treatment group as $Y_1 = g_1(X) + U_1$ and the no treatment group as $Y_0 = g_0(X) + U_0$, where U_1 and U_0 are unobservables, with expected value of zero, after conditioning on X . The functions g_0 and g_1 are the specialized functions for each group, respectively. According to these authors, the difference in difference matching estimator can be justified if equation (4) can also be expressed as: $E(U_{0,t=1} - U_{0,t=0} \mid X, D = 1) = E(U_{0,t=1} - U_{0,t=0} \mid X, D = 0)$, which is equivalent to $E(U_{0,t=1} - U_{0,t=0} \mid P(X), D = 1) = E(U_{0,t=1} - U_{0,t=0} \mid P(X), D = 0)$

Testing mean independence

If mean independence exists, and the outcome when no treatment is received is unrelated to group assignment, then pre-treatment variables must also be independent of group assignment. In other words, observable characteristics must have comparable distributions across groups (Becker and Ichino 2002). This is also known as the balancing property and it is assumed to also be true for unobservable characteristics.

To show the balancing property holds, it is customary to show pre and post matching means difference tests of the treatment and control groups. In this chapter, the propensity scores are estimated using the command **pscore** in Stata 11. This command allows for a more exhaustive test of the balancing property. It starts by splitting the sample in five intervals. Within each interval, it tests that the mean of the propensity score does not differ across groups. If this does not hold, the interval is split in half and the test is repeated. Once intervals are created, it tests, for each interval, that the means of the covariates (i.e. all variables in X) do not differ across groups (Becker and Ichino 2002). If any of the covariates' mean in any of the intervals differs across groups, then the balancing property is not met.

Matching algorithms

Once the propensity score is estimated, households in treatment areas can be matched to households in control areas. The literature shows a variety of matching algorithms that may be used identify a counterfactual. I show results using three matching algorithms: first, nearest neighbor matching, second, kernel matching, and third, stratification. In nearest neighbor matching, treatment households are matched with the control households that have the closest propensity score. Matching is done with replacement. The kernel method compares each treated observation with a weighted average of all observations in the comparison group. In each average, higher weight is given to observations closest to the treated observation. Finally, stratification or block matching creates intervals of the propensity score. The propensity score should be balanced within each interval. Should this be the case, then the treatment effect will be the average of the effect within each interval (Diaz and Handa 2006; Caliendo and Kopeinig 2008). The

intervals used in this chapter are those created during the balancing property test, in which covariates are balanced (Becker and Ichino 2002).

Specification of the propensity score model

The probability of group assignment was tested following the work of Angelucci and Attanasio (2006, 2006b, 2009). I include measures of household size, number of children, work and school situation of children, the household poverty index as a second order polynomial, external shocks, doctor consultations, work and schooling status of the head of household and spouse, as well as head of household prior work history.

As mentioned above, another potential source of bias is transitory shocks. Since treatment areas were designated as such on the basis of higher concentration of households under poverty, it would be reasonable to expect them to be exposed to transitory shocks (such as unemployment) at higher rates than control areas.

Angelucci and Attanasio (2006, 2006, 2009) studied the trade-offs in the specification of the propensity score using ENCELURB when including variables associated to the idiosyncratic decisions in the assignment of treatment and control areas. In short, area specific covariates in the propensity score, such as percentage of poor households per block, greatly reduces the area of common support. Still, it is necessary for the propensity score specification to account for differences across areas that improve the quality of matching. The authors propose household-level variables in addition to GDP growth rates per state, state indicator variables (Angelucci and Attanasio 2009), and the number of schools and health centers per household (Angelucci and Attanasio 2006). In all cases, including aggregate variables decreases the area of common support or shows no statistically significant contribution to the propensity score model. Still, the trade-off at hand is between leaving out from the propensity score estimation differences in trends across treatment and control areas that may keep results unbiased. In the particular case of private transfers, transitory shocks more than short term aggregate economic growth, tend to better explain changes in the likelihood and amount of flow (unless, of course, the program takes place in the midst of a recession or rapid expansion period, which is not

the case). The most of the results below show outcomes without GDP growth rate variable due to its potential effect on the area of common support and the balancing property. Given that transitory shocks may still be an issue, I use GDP growth rates in additional specifications²⁷, also shown bellow.

3.4. Results

Description of prevalence of transfers

Descriptive results in Table 3.3 show the prevalence of giving and receiving private transfers, as well as the amount given and received at baseline²⁸. The rows show the outcome of interest: whether households receive or give private transfers and how much. The columns split the sample in relevant groups: households in treatment and control areas, compliers in treatment and in control areas, as well as non-compliers in treatment areas.

Two results stand out. First, that receiving private transfers is more prevalent than giving. In treatment areas, for instance, 19.7 percent of households reported receiving private transfers, while only 6.1 percent reported giving them. These results contrast with the ones found by Teruel and Davis (2000), who report that, for rural households under Progresa, about 6.1 percent give *or* receive private transfers at baseline.

The second result standing out from Table 3.3 is that the amount given is smaller than the amount received during a 12 month period. In treatment areas the average yearly amount received was \$1,183 pesos, while the amount given is nearly slightly over half as much (\$600 pesos). Households in treatment areas, particularly those who were registered in the program receive a lower amount of transfers than households in control areas, a result perhaps related to the larger proportion of households classified as poor in treatment areas.

²⁷ The GDP growth rates by state used here are from Angelucci and Attnassio (2009)

²⁸ The frequencies shown in Table 3.3 include only baseline information

Table 3.3 – Distribution of private transfer providers and recipients across groups at baseline

		Treatment	Control	Compliers in Treatment area	Compliers in Control areas	Non Compliers in Treatment area
		(Z=1)	(Z=0)	(D=1 Z=1)	(D=0 Z=0)	(D=0 Z=1)
Receiving Transfers	Yes (N (%))	960 (19.7%)	259 (19.8%)	698 (21.4%)	251 (20.2%)	262 (16%)
	No (N (%))	3,933 (80.3%)	1,047 (80.2%)	2,557 (78.5%)	994 (79.8%)	1,373 (84%)
Amount received	Mean (SD)	1,183.5 (3,235.0)	1,715 (4,086.1)	983.3 (2,869.7)	1,670.4 (4,027.7)	1,716.8 (4,008.4)
	N	960	259	698	251	262
Giving transfers	Yes (N (%))	381 (6.1%)	149 (4.1%)	240 (5.9%)	147 (4.3%)	144 (6.4%)
	No (N (%))	5,914 (93.9%)	3,469 (95.9%)	3,841 (94.1%)	3,313 (95.7%)	2,060 (93.6%)
Amount given	Mean (SD)	600.6 (1718.7)	779.4 (2171.8)	513.9 (1492.2)	785.9 (2185)	748.1 (2045.05)
	N	381	149	240	147	144

Data: ENCELURB, 2002

Means comparisons between treatment and control groups

Each of the average effects reported require estimating a propensity score based on the sub-sample of interest. Table 3.4 shows the means and means comparisons at baseline of the characteristics of households that were included in the propensity score for those households in the treatment and control areas. Upon inspection, both areas show similar means for each of the covariates. In spite of this, many of these differences are statistically significant. In particular, in control areas, a larger proportion of households have 7 or more members, as well as a larger average number of children less than 10 years of age. Furthermore, the average number of children going to school between ages 6 to 10 is larger in control areas.

The poverty index, estimated as part of the evaluation process of Oportunidades to assess household eligibility, was larger for households in control areas. This result is counterintuitive since treatment areas were selected due to a higher number of households

living under poverty. A possible explanation for this is that, though treatment areas may be larger in numbers, control areas have households with poorer living conditions. Given that this result might be the result of the sub-sample (i.e. those who responded to transfer questions) Appendix 3.1 includes a table with means comparisons including all sampled households living under poverty. Appendix A shows results including all and the subsample share substantial similarities. In short, these results indicate that there are imbalances in the treatment and control group that can be addressed through propensity score matching.

As noted above, the comparison groups in this analysis are not limited to treatment and control groups. I also compare compliers and non compliers in treatment areas, as well as compliers in treatment areas with compliers in control areas. The results of such comparisons are shown in Table B and Table C in Appendix A. Both tables show imbalances across all comparison groups that, as before, can be addressed with propensity score matching.

Table 3.4 - Means and means comparisons of the characteristics of households who reported receiving or not private transfers by treatment and control group

Variable	Treatment		Control		Difference
	Mean	SD	Mean	SD	
Household has 1-3 members	19.7%	0.398	14.7%	0.354	5.0% ***
Household has 4-6 members	58.2%	0.493	57.0%	0.495	1.3%
Household has 7 or more members	22.1%	0.415	28.3%	0.451	-6.3% ***
Number of children in the household					
Ages 0 to 5	0.92	0.951	1.07	1.057	-0.14 ***
Ages 6 to 10	0.91	0.932	1.02	0.939	-0.11 ***
Ages 11 a 15	0.72	0.904	0.74	0.921	-0.02
Ages 16 to 20	0.43	0.730	0.43	0.763	0.00
Number of children going to school					
Ages 0 to 5	0.10	0.311	0.13	0.343	-0.02
Ages 6 to 10	0.85	0.908	0.98	0.922	-0.13 ***
Ages 11 to 15	0.59	0.820	0.61	0.843	-0.02
Ages 16 to 20	0.12	0.373	0.11	0.382	0.01
Number of children who work					
Ages 0 to 5	0.00	0.000	0.00	0.000	0.00
Ages 6 to 10	0.02	0.145	0.02	0.192	-0.01

Variable	Treatment		Control		Difference
	Mean	SD	Mean	SD	
Ages 11 to 15	0.07	0.302	0.06	0.292	0.01
Ages 16 to 20	0.06	0.278	0.05	0.265	0.01
Poverty index	1.61	0.719	1.64	0.752	-0.04
Poverty index squared	3.10	2.980	3.26	3.287	-0.16 *
External shocks in the past year					
Death of a family member	12.5%	0.330	9.9%	0.298	2.6% **
Loss of employment of a member of the household	17.2%	0.377	11.1%	0.314	6.1% ***
Loss of business	0.5%	0.070	0.8%	0.087	-0.3%
Natural disaster or fire	4.6%	0.209	3.0%	0.170	1.6% **
Visited the doctor in the past year					
At least one child	28.3%	0.451	27.2%	0.445	1.1%
Head of household	10.8%	0.310	10.7%	0.309	0.0%
Spouse of head of household	11.3%	0.317	10.0%	0.300	1.4%
Characteristics of head of household					
Head of household is married or cohabiting	76.2%	0.426	81.2%	0.391	-5.0% ***
Sex (male)	75.2%	0.432	81.9%	0.386	-6.7% ***
Age	40.9	15.121	42.1	15.154	-1.2 **
Age squared	1903.4	1507.3	2001.7	1535.2	-98.3 **
Currently working for money	79.3%	0.405	79.4%	0.405	-0.1%
Spouse of head of household employed	15.4%	0.361	12.3%	0.328	3.2% ***
Head of hh. Can read/write	76.2%	0.426	80.3%	0.398	-4.1% **
Spouse of head of hh. Can read/write	55.2%	0.497	63.7%	0.481	-8.5% ***
Schooling of head of household					
Incomplete primary	32.3%	0.468	31.0%	0.463	1.3%
Complete primary	19.5%	0.396	23.1%	0.422	-3.7% **
Incomplete secondary	5.3%	0.224	5.5%	0.228	-0.2%
Complete secondary	11.8%	0.323	15.6%	0.363	-3.8% ***
More than secondary	29.6%	0.457	23.2%	0.422	6.4% ***
Characteristics of spouse of head of household					
Incomplete primary	26.0%	0.439	24.5%	0.430	1.5%
Complete primary	18.0%	0.384	22.7%	0.419	-4.7% ***
Incomplete secondary	4.0%	0.197	3.3%	0.179	0.8%
Complete secondary	9.5%	0.294	11.8%	0.323	-2.3% **
More than secondary	17.1%	0.377	17.6%	0.381	-0.5%
Head of household worked in 1999	83.4%	0.372	83.0%	0.376	0.4%
Head of household worked in 2000	85.0%	0.358	83.0%	0.376	2.0% *

Variable	Treatment		Control		Difference
	Mean	SD	Mean	SD	
Head of household worked in 2001	86.6%	0.340	84.6%	0.361	2.0% *
Sample size	4,893		1,306		

*Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$*

Data: ENCELURB, 2002

Results from PS regression

The propensity score regressions are shown in Table 3.5 for households that responded about receiving and those that responded about giving transfers. Results show that larger households are less likely to be enrolled in Oportunidades.

One of the main components of the program is education. In general, the number of children was either non significant or negative, but having children in enrolled in school was associated to a higher likelihood of being in the treatment area and being a complier in treatment areas. In general, having working children had a direct association with the likelihood of program enrollment.

As expected, poverty was associated to higher likelihood of being in treatment areas and enrollment. This implies that households in treatment areas might be exposed to more external shocks than households in control areas. The variables about external shocks include loss of employment by at least one household member. This variable is significant and positive when comparisons happen across groups, but not when comparing compliers and non-compliers within treatment areas. Finally, living in a treated area and being enrolled in treatment had a negative association to having a male head of household.

Table 3.5 – Propensity score Probit regressions for the three comparison groups: treatment and control area, compliers and non-compliers in treatment area and compliers in treatment and control areas for households that responded to receiving private transfers and giving private transfers.

Variable	Receiving private transfers						Giving private transfers					
	P(Z=1 X)		P(D=1 Z=1)		P(V=1 X)		P(Z=1 X)		P(D=1 Z=1)		P(V=1 X)	
	Coeff.	SD	Coeff.	SD	Coeff.	SD	Coeff.	SD	Coeff.	SD	Coeff.	SD
Household has 1-3 members							0.173	0.067 **	0.180	0.084 **	0.254	0.078 ***
Household has 4-6 members	-0.028	0.063	0.041	0.063	-0.037	0.072	0.044	0.044	0.260	0.057 ***	0.150	0.051 ***
Household has 7 or more members	-0.106	0.092	-0.216	0.096 **	-0.215	0.106 **						
Number of children in the household												
Ages 0 to 5	-0.081	0.026 ***	-0.054	0.030 *	-0.104	0.029 ***	-0.095	0.019 ***	-0.040	0.026	-0.105	0.021 ***
Ages 6 to 10	0.108	0.074	-0.019	0.073	0.093	0.081	-0.161	0.042 ***	-0.015	0.061	-0.168	0.048 ***
Ages 11 to 15	-0.016	0.049	-0.221	0.052 ***	-0.071	0.058	-0.083	0.033 **	-0.175	0.045 ***	-0.149	0.039 ***
Ages 16 to 20	-0.027	0.033	-0.063	0.035 *	-0.040	0.038	-0.046	0.023 **	-0.058	0.030 *	-0.061	0.027 **
Number of children going to school												
Ages 0 to 5	-0.021	0.059	0.144	0.067 **	0.019	0.065	0.083	0.044 *	0.110	0.058 *	0.100	0.049 **
Ages 6 to 10	-0.168	0.074 **	0.101	0.074	-0.137	0.080 *	0.092	0.042 **	0.118	0.061 *	0.126	0.047 ***
Ages 11 to 15	0.011	0.051	0.361	0.054 ***	0.111	0.060 *	0.066	0.035 *	0.322	0.047 ***	0.175	0.041 ***
Ages 16 to 20	0.066	0.060	0.163	0.063 ***	0.105	0.066	0.097	0.044 **	0.164	0.056 ***	0.147	0.049 ***
Number of children who work												
Ages 6 to 10	-0.135	0.116	-0.340	0.136 **	-0.248	0.134 *	-0.029	0.095	-0.323	0.121 ***	-0.146	0.111
Ages 11 to 15	0.048	0.069	0.188	0.076 **	0.080	0.075	0.171	0.055 ***	0.139	0.068 **	0.204	0.060 ***
Ages 16 to 20	0.034	0.076	-0.006	0.076	0.006	0.085	0.270	0.062 ***	-0.059	0.067	0.231	0.069 ***
Poverty index	-0.015	0.102	0.925	0.113 ***	0.435	0.113 ***	-0.172	0.071 **	0.776	0.099 ***	0.227	0.079 ***
Poverty index squared	0.000	0.024	-0.118	0.028 ***	-0.072	0.026 ***	0.046	0.017 ***	-0.087	0.025 ***	-0.013	0.018

Variable	Receiving private transfers						Gaving private transfers					
	P(Z=1 X)		P(D=1 Z=1)		P(V=1 X)		P(Z=1 X)		P(D=1 Z=1)		P(V=1 X)	
	Coeff.	SD	Coeff.	SD	Coeff.	SD	Coeff.	SD	Coeff.	SD	Coeff.	SD
External shocks in the past year												
Death of a family member	0.112	0.060 *	-0.002	0.060	0.121	0.067 *	0.057	0.042	0.029	0.052	0.090	0.048 *
Loss of employment of a member of the household	0.280	0.055 ***	0.076	0.053	0.287	0.061 ***	0.335	0.040 ***	0.071	0.046	0.338	0.044 ***
Characteristics of head of household												
Head of household is married or cohabiting	0.008	0.091	0.253	0.094 ***	0.099	0.106	0.138	0.065 **	0.142	0.081 *	0.210	0.075 ***
Sex (male)	-0.269	0.077 ***	-0.280	0.076 ***	-0.376	0.088 ***	-0.276	0.054 ***	-0.312	0.066 ***	-0.383	0.062 ***
Age	-0.026	0.007 ***	0.018	0.006 ***	-0.018	0.008 **	-0.029	0.005 ***	0.018	0.006 ***	-0.020	0.006 ***
Age squared	0.0002	0.000 ***	0.000	0.000 ***	0.000	0.000	0.000	0.000 ***	0.000	0.000 ***	0.000	0.000 *
Currently working for money	0.012	0.061	-0.004	0.061	0.020	0.068	-0.075	0.046 *	0.027	0.054	-0.071	0.052
Spouse of head of household employed	0.206	0.056 ***	-0.098	0.056 *	0.190	0.063 ***	0.171	0.039 ***	-0.085	0.049 *	0.150	0.044 ***
Head of hh. Can read/write	0.058	0.064	-0.199	0.065 ***	0.017	0.072	0.027	0.046	-0.152	0.057 ***	-0.025	0.052
Spouse of head of hh. Can read/write	-0.341	0.066 ***	-0.035	0.066	-0.353	0.073 ***	-0.404	0.049 ***	-0.055	0.059	-0.410	0.055 ***
Constant	1.711	0.248 ***	-1.188	0.244 ***	0.796	0.283 ***	1.340	0.188	-1.385	0.238	0.301	0.217
Sample size	6199		4890		4500		9919		6291		7550	

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: ENCELURB, 2002

Results from balancing property

Table 6 shows the characteristics of the propensity score estimates. It shows results for all the comparison groups among the households that received transfers and for all the households that did not and for all comparison groups for households that gave transfers. For households giving and receiving, the propensity score mean ranged between 0.54 and 0.78, each with moderate variations. As mentioned above, the balancing property is tested for each covariate in each block or interval. Here, such tests use a p-value of 0.001 and, in all cases, the balancing property was met.

Note that very few observations fall outside the area of common support. For instance, out of 354 households that reported receiving financial or in-kind transfers in treatment areas ($P(D=1|Z=1)$), 9 observations (2.5 percent) fall outside the area of common support. Other groups show smaller number of households (if any) outside of the area of common support.

As mentioned above, the specification of the propensity score models is relevant in determining the quality of the matching. In particular, transitional shocks that may affect one group more than the other can result in biased estimates if not accounted for. Estimates of the propensity score including GDP growth rate by State (not shown) attempted to address this issue. The results yielded similar distributions and missing observations as the ones presented in Table 6. The balancing property, however, did not hold in most cases. Upon closer examination, results indicate that the variable is imbalanced across most intervals, along with other variables. The result is not entirely surprising since some states had few to none households in the treatment category. Still, the GDP growth variable is statistically significant in groups that compare households across areas (i.e. treatment and control), but not when comparing compliers and non compliers within treatment areas. This shows that, if anything, this variable does account for differences across the two groups.

Table 3.6 - Description of the propensity score matching function, by outcome and comparison group

	Received transfers											
	If Received transfers						Amount Received					
	P(Z=1 X)		P(D=1 Z=1)		P(V=1 X)		P(Z=1 X)		P(D=1 Z=1)		P(V=1 X)	
Region of common support	[.4550, .98129]		[.22492, .97314]		[.3510, .96759]		[.3349, .99715]		[.19092, .98978]		[.2926261, .9961353]	
Mean	0.7892491		0.665453		0.7231287		0.7985928		0.705891		0.7404606	
Standard deviation	0.0826477		0.1479794		0.1117039		0.1093417		0.164062		0.1457548	
Significance of balancing property	0.001		0.001		0.001		0.001		0.001		0.001	
# blocks	8		10		7		5		6		5	
Block	Treatment	Control	Enrolled	Not enrolled	Treatment and enrolled	Control and not enrolled	Treatment	Control	Enrolled	Not enrolled	Treatment and enrolled	Control and not enrolled
1	54	56	2	0	22	4	2	1	9	1	20	6
2	268	517	126	62	276	325	38	46	24	11	79	93
3	562	1,763	284	240	408	786	163	398	124	133	144	356
4	242	1,168	228	209	349	1,092	83	518	87	146	54	396
5	140	969	184	307	174	899	18	242	58	213		
6	40	420	400	750	16	149			52	347		
7			146	379								
8			103	417								
9			145	713								
10			17	178								
11												
Total Sample	1306	4893	1635	3255	1245	3255	304	1205	354	851	297	851
N in common support	1305	4893	1627	3255	1236	3255	304	1205	345	851	294	851

	Gave transfers											
	If gave transfers						Amount given					
	P(Z=1 X)		P(D=1 Z=1)		P(V=1 X)		P(Z=1 X)		P(D=1 Z=1)		P(V=1 X)	
Region of common support	[.23356, .97096]		[.22895624, .99374963]		[.161982, .931990]		[.23512351, .9954619]		[.16819873, .9950784]		[.1347805, .99480398]	
Mean	0.6344811		0.6488807		0.5406133		0.7544808		0.643687		0.6663548	
Standard deviation	0.1222099		0.1462125		0.1434272		0.1583317		0.202726		0.2205167	
Significance of balancing property	0.001		0.001		0.001		0.001		0.001			
# blocks	9		8		8		5		5			
Observations per block	Treatment	Control	Enrolled	Not enrolled	Treatment and enrolled	Control and not enrolled	Treatment	Control	Enrolled	Not enrolled	Treatment and enrolled	Control and not enrolled
1	0	2	0	2	4	45	0	3	1	9	1	4
2	74	176	86	199	58	187	5	3	13	17	11	27
3	535	610	373	429	337	663	32	33	41	43	32	41
4	1,413	1,114	282	289	844	929	117	45	75	39	74	19
5	933	577	437	275	1,050	828	168	22	77	7	89	14
6	979	452	963	512	950	564						
7	888	343	998	337	601	208						
8	699	192	945	164	240	43						
9	774	159										
Total Sample	6295	3625	4084	2207	4084	3467	322	106	207	115	207	105
N in common support	6295	3622	4084	2202	4084	3448	322	102	207	111	207	101

Data: ENCELURB, 2002

Crowd out or not?

Table 7 shows the results from the difference in difference estimates. Each column represents a treatment effect. For each outcome, the table shows the Average Intent to Treat (AIT), which compares households in treatment and control areas regardless of compliance. It also shows the Average Treatment effect on the Treated (ATT) comparing compliers and non compliers in treatment areas. Finally, it shows the ATT when comparing compliers in treatment and control areas. The rows, on the other hand, show different matching estimators (Stratification, Kernel, and Nearest Neighbor). In addition, Table 7 also includes treatment effects using Stratification matching after including the GDP growth variable in the propensity score regression.

Table 7 shows that evidence of crowd out is most consistent in the ATT in the treatment area, shown in column (2). Specifically, column (2) shows that the change over time in the likelihood of receiving transfers is 3.1 to 3.6 percent smaller than it would have been in the absence of the program. These results were statistically significant in all but one matching method.

Column (1) and column (3) show somewhat different results. Notice that both differ from column (2) in that (1) and (3) compare households from treatment and control areas, whereas (2) only uses information from the treatment area. Results in column (1) show a zero or positive treatment effect on the likelihood of transfers (i.e. no crowd out), whereas column (3) shows zero treatment effect across all matching methods.

Table 3.7 – AIT and ATT on the likelihood and amount of private transfers given and received

Received transfers (t-test in parenthesis)*						
	Likelihood of receiving transfers			Amount Received		
	(1)	(2)	(3)	(4)	(5)	(6)
Matching method	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)
Stratification	0.043 (2.607)	-0.031 (-1.747)	0.030 (1.580)	85.762 (0.260)	-686.392 (-1.461)	54.996 (0.177)
Kernel	0.034 (2.093)	-0.036 (-2.307)	0.020 (1.130)	186.266 (0.611)	-697.127 (-1.651)	68.453 (0.230)
Nearest neighbor	-0.010 (-0.604)	-0.032 (-1.477)	0.004 (0.170)	-48.656 (-0.106)	-1731.609 (-2.636)	-75.421 (-0.164)
Stratification (GDP)	0.015 (0.792)	-0.036 (-1.929)	0.000 (0.002)	-271.167 (-0.731)	-680.501 (-1.455)	-395.587 (-0.947)
Gave transfers (t-test in parenthesis) *						
	Likelihood of giving transfers			Amount given		
	(7)	(8)	(9)	(10)	(11)	(12)
Matching method	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)
Stratification	0.003 (0.414)	-0.002 (-0.153)	0.001 (0.138)	-77.099 (-0.655)	176.405 (0.896)	4.406 (0.032)
Kernel	0.005 (0.646)	-0.003 (-0.279)	0.002 (0.237)	-64.801 (-0.508)	151.106 (0.911)	6.595 (0.046)
Nearest neighbor	-0.002 (-0.185)	0.000 (0.009)	0.006 (0.533)	-47.857 (-0.206)	27.295 (0.163)	18.164 (0.089)
Stratification (GDP)	-0.011 (-1.27)	-0.002 (-0.166)	-0.009 (-0.983)	-109.11 (-0.785)	137.306 (0.993)	-21.525 (-0.126)

Data: ENCELURB 2002, 2003

*From bootstrapped standard errors with 500 repetitions.

Table 3.8 - Local average treatment effect on

	Coefficient	Bootsr. SE*	Z
Likelihood of receiving transfers	0.0508	0.02436	2.09
Amount Received	261.90	430.43	0.61
Likelihood of giving transfers	0.0071	0.0105	0.68
Amount given	-100.32	207.87	-0.48

Data: ENCELURB 2002

*From bootstrapped standard errors with 500 repetitions.

This difference between results could be due to general equilibrium effects in treatment areas (i.e. SUTVA does not hold), particularly if the program affected non-compliers. Unlike households in control areas, non-compliers²⁹ had physical proximity to compliers and information about the program could have been more readily available.

Results about the amount of transfers received (columns (4) to (6)) indicate no evidence of crowding out. The only treatment effect with statistical significance is shown in column (5) for the Nearest Neighbor matching. As a robustness check, I estimated the result from column (5) including the GDP growth rate variable in the propensity score regression and using nearest neighbor matching. The balancing property was met and the outcome was not statistically significant³⁰.

The bottom panel in Table 7 includes the treatment effect estimates on the likelihood of giving financial or in-kind transfers (columns (7) to (9)) and on the amount (columns (10) to (12)). Without exception, these results indicate that the Oportunidades program has not affected transfer-giving decisions.

Table 8 shows results of the LATE on all outcomes using Stratification matching. Recall that the LATE is the AIT divided by the proportion of compliers in treatment areas. As expected, the LATE coefficients are all larger (in absolute value) than the AIT³¹ estimates, but only the result on the likelihood of receiving transfer was statistically significant. I addressed the possibility of any bias by also estimating the LATE including the GDP growth rate in the propensity score regression and found the result no longer statistically significant.

²⁹ Recall that non-compliers in treatment areas are households who were eligible but did not enroll.

³⁰ (ATT=-143.7, with an estimated t-statistic of -1.03)

³¹ This observation derives from comparing results from Table 8 with AIT results estimated with Stratification matching shown in Table 7.

Table 3.9 - AIT and ATT on the likelihood and amount of private transfers given and received in households with at least one adult 50 and older

Received transfers (SE in parenthesis)						
	Likelihood of receiving transfers			Amount Received		
Matching method	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)
Stratification	-0.036 (0.038) n _T =1372 n _C =378	-0.041 (0.037) n _T =877 n _C =494	-0.038 (0.042) n _T =872 n _C =437	107.1 (523.8) n _T =394 n _C =95	-1814 (947.5)* n _T =277 n _C =132	-213.8 (482.9) n _T =262 n _C =88
Gave transfers (SE-test in parenthesis)						
	Likelihood of giving transfers			Amount given		
Matching method	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)
Stratification	-0.005 (0.038) n _T =1527 n _C =926	0.007 (0.021) n _T =986 n _C =540	-0.008 (0.013) n _T =986 n _C =880	-208.1 (210.96) n _T =137 n _C =53	931.4 (1,228.9) n _T =76 n _C =44	-213.7 (247.7) n _T =69 n _C =21

Data: ENCELURB 2002, 2003

**From bootstrapped standard errors with 500 repetitions.*

Table 3.9 shows the AIT and ATT for households with adults 50 and older. This table, along with Table 3.10, is organized as follows. The first row of numbers represents the treatment effect. The number in parenthesis is the standard error. The numbers at the bottom represent the sample size for the treatment and the comparison group, respectively. Results from Table 3.9 show no crowd out effect on the amount of transfers given or received by households with at least one adult 50 and older. . It is worth noting that the number of observations on the amount given is small, consequently results for these results should to be interpreted with caution.

Table 3.10 - AIT and ATT on the likelihood and amount of private transfers given and received in female headed households

Received transfers (SE in parenthesis)						
	Likelihood of receiving transfers			Amount Received		
Matching method	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)
Stratification	-0.003 (0.05) n _T =1215 n _C =234	-0.048 (0.04) n _T =822 n _C =390	-0.038 (0.053) n _T =822 n _C =222	-1140.11 (796.1)* n _T =406 n _C =69	-737.1 (939.9) n _T =286 n _C =123	-2174.7 (1008.9)** n _T =280 n _C =65
Gave transfers (SE in parenthesis)						
	Likelihood of giving transfers			Amount given		
Matching method	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)
Stratification	0.018 (0.018) n _T =1571 n _C =626	-0.02 (0.024) n _T =1044 n _C =522	0.018 (0.021) n _T =1044 n _C =601	46.5 (75.1) n _T =352 n _C =113	180.72 (102.3) n _T =199 n _C =153	147.8 (92.98) n _T =199 n _C =96

Data: ENCELURB 2002, 2003

*From bootstrapped standard errors with 500 repetitions.

Results from Table 3.10 show that, as before, the likelihood and amount of transfers given have not been affected by the program and neither has the likelihood of receiving transfers in female-headed households. The results for the amount received however, shows crowding out of the amount received. I interpret results for AIT given that it provides the most conservative estimate of the treatment effect. The AIT shows that the amount of transfers received in female headed households is \$1,140 pesos a year lower because of the program. Estimates using Oportunidades data show that, after including money received from school enrollment, school supplies and the nutritional transfer, beneficiary households received \$2,994.05 pesos a year on average. Therefore, for every peso Oportunidades granted to female headed households in 2003, the amount of private transfers decreased by \$0.38 cents, suggesting a partial crowd out effect. In contrast, results for male-headed households (shown in Table 14 of Appendix 3.1) show no crowding out on the amount of transfers received.

3.5. Discussion

The results here show that, on average, the Oportunidades program does not crowd the likelihood and amounts of money or in-kind transfers that households give to individuals living out of the dwelling. The estimates of the program effect on all beneficiary households and on households with at least one adult 50 and show no crowding out on the likelihood and amount of financial or in-kind transfers received.

In female-headed households the program crowded out \$0.38 cents of private transfers received for every peso provided by Oportunidades, while no crowding out occurred in male-headed households. Even though this result might be partly explained by women being the main recipients of the public cash transfer, it is also possible that differences in labor outcomes for women explain this result. For instance, women tend to have lower earnings than men, which might require other family members to enter the labor market or to spread current earnings across households. Therefore, the program might allow non-co-resident family members to either leave the labor market or to assign resources to a different activity.

Even though previous research about crowding out of private transfers by CTP shows contradicting evidence, recent research (Juarez 2008) suggests that Mexico City's unconditional cash transfer program to adults 70 and older crowds out \$0.86 pesos of private transfers for every peso the program provides. The literature on private transfers shows that among the oldest of old individuals, monetary transfers are less likely to occur. Therefore it is possible that the size of crowding out observed in the unconditional cash transfer program is the result of the susceptibility of donors to substitute financial for time assistance when the recipients are among the oldest of the old. Alternatively, the size of crowding out of that program could be explained by the unconditional nature of the cash transfer. Furthermore, the result that not all households face crowding out in urban Oportunidades might occur because households have an incentive to use the public cash transfer to meet the program goals, which are regularly monitored. Therefore, recipients may still have other needs for which they may not use funds from the public

program giving donors an incentive to transfer to meet needs outside the scope of Oportunidades.

Another finding comes from results about the likelihood of receiving transfers, which show that, when the comparison group is households in the control area, there is no evidence of crowding out. However, when treated households are compared with households in treatment areas that did not enroll in Oportunidades (for simplicity called here “non-compliers”) results show treated households’ likelihood of receiving transfers is 3.1 to 3.6 percent smaller than for those outside the program.

It is worth noting that non-compliers lived in the same blocks as treated households. It is possible that, once the program was in place, information became more readily available for households in treatment areas (including non-compliers) due to physical proximity. This is not necessarily an issue for households in control areas since they were not matched to treatment households based on distance but on other characteristics of the household. This observation raises the concern that the program could have had unintended effects for non-compliers in treatment areas. For instance, the program could have motivated donors to provide transfers to non-compliers in the expectation of benefiting if they enrolled at a later stage. Perhaps more importantly, it is also possible that individuals in treatment areas who did comply entered with a set of unobservable characteristics that rendered biased results in the comparison within treatment areas. In either case, these results indicate that the assumptions for identification of the model and propensity score matching ought to be carefully kept in mind, particularly when the determinants of self selection remain unobserved. In terms of interpretation of results, the AIT represents the most conservative estimate since it is likely to show a lower bound of the actual treatment effect.

In addition to potential crowding out of transfers to households, previous research by Teruel and Davis (2002) has pointed at the practical concern of program resources being used to care for needs of other households. The authors found this is was not the case in

the rural data for Progresa, a result that is consistent with the findings reported here for urban households in Oportunidades.

Regarding future research, it is yet to be understood how individuals and households adjust their transfer giving and receiving behavior over time. For instance, Cox, Hansen and Jimenez (2004) propose that transfer decisions take into account the future availability of resources from public programs. Given the duration of the Oportunidades program, research in this area could render valuable evidence about the role of such programs on long term decisions about private transfers.

Another area of research, closely related to family transfers and to the aims of Oportunidades (and most conditional cash transfer programs), is their relationship to health. This is a relationship with many intricacies that is far from understood and may have implications in the design of a household-centered program. For instance, no research is available about how cash transfer programs affect or complement the health investment adult children make in their parents. It also remains unclear how and whether improvements to health outcomes due to the program have any effect on donors' decision to transfer, and how such decision would affect the donor's and recipient's well being.

Overall, the results of this study show that Oportunidades has not affected all transfers or all households in the same manner, at least not within a year of its implementation. Still, the relationship between how households share resources and exogenous assistance from programs like Oportunidades, is far from simple and yet to be completely understood.

3.6. References

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Appendix 3.1

Table 3.11 - Means and means comparisons of the characteristics of households who reported receiving or not private transfers, including ALL poor households

Variable	Difference				Difference in difference	
	Treatment		Control			
	Mean	SD	Mean	SD		
Household has 1-3 members	21.1%	0.408	13.8%	0.344	7.3%	***
Household has 4-6 members	58.2%	0.493	59.6%	0.491	-1.4%	
Household has 7 or more members	20.8%	0.406	26.7%	0.442	-5.9%	***
Number of children in the household						
Ages 0 to 5	0.93	0.953	1.06	1.029	-0.13	***
Ages 6 to 10	0.88	0.921	1.02	0.945	-0.14	***
Ages 11 to 15	0.70	0.894	0.74	0.935	-0.04	**
Ages 16 to 20	0.43	0.730	0.43	0.743	0.00	
Number of children going to school						
Ages 0 to 5	0.11	0.312	0.11	0.320	0.00	
Ages 6 to 10	0.81	0.895	0.93	0.925	-0.12	***
Ages 11 to 15	0.56	0.803	0.57	0.837	-0.01	
Ages 16 to 20	0.11	0.366	0.10	0.350	0.02	**
Number of children who work						
Ages 0 to 5	0.00	0.000	0.00	0.000	0.00	
Ages 6 to 10	0.02	0.143	0.01	0.148	0.00	
Ages 11 to 15	0.06	0.293	0.04	0.242	0.02	***
Ages 16 to 20	0.06	0.277	0.03	0.200	0.03	***
Poverty index	1.61	0.727	1.65	0.733	-0.03	**
Poverty index squared	3.13	3.034	3.25	3.209	-0.11	*
External shocks in the past year						
Death of a family member	12.6%	0.332	10.5%	0.307	2.1%	***
Loss of employment of a member of the household	17.2%	0.377	10.2%	0.302	7.0%	***
Loss of business	0.5%	0.069	0.5%	0.070	0.0%	
Natural disaster or fire	4.5%	0.206	2.3%	0.150	2.1%	***
Visited the doctor in the past year						
At least one child	27.1%	0.445	26.6%	0.442	0.6%	
Head of household	10.4%	0.305	8.8%	0.283	1.6%	**
Spouse of head of household	11.3%	0.317	9.6%	0.295	1.7%	***
Characteristics of head of household						
Head of household is married or cohabiting	75.8%	0.428	80.9%	0.393	-5.1%	***
Sex (male)	75.0%	0.433	82.4%	0.381	-7.4%	***

Age	40.1	15.007	41.3	14.994	-1.2	***
Age squared	1829.6	1485.2	1930.2	1510.3	-100.6	***
Currently working for money	79.9%	0.401	81.8%	0.386	-1.9%	**
Spouse of head of household employed	15.4%	0.361	12.9%	0.335	2.5%	***
Schooling of head of household and spouse						
Head of hh. Can read/write	76.0%	0.427	79.5%	0.403	-3.5%	***
Spouse of head of hh. Can read/write	55.3%	0.497	64.7%	0.478	-9.4%	***
Head of hh. with incomplete primary	31.8%	0.466	28.9%	0.453	2.9%	***
Head of hh. with Complete primary	19.6%	0.397	23.4%	0.424	-3.9%	***
Head of hh. with Incomplete secondary	5.5%	0.227	5.0%	0.217	0.5%	
Head of hh. with Complete secondary	11.9%	0.324	15.5%	0.362	-3.6%	***
Head of hh. with More than secondary	29.5%	0.456	25.2%	0.434	4.3%	***
Spouse of head of hh with Incomplete primary	25.2%	0.434	23.3%	0.423	2.0%	**
Spouse of head of hh with Complete primary	17.9%	0.384	22.8%	0.420	-4.9%	***
Spouse of head of hh with Incomplete secondary	3.9%	0.194	3.8%	0.191	0.1%	
Spouse of head of hh with Complete secondary	9.8%	0.297	12.5%	0.331	-2.7%	***
Spouse of head of hh with More than secondary	17.6%	0.381	18.4%	0.387	-0.8%	
Head of household worked in 1999	83.2%	0.374	82.4%	0.381	0.8%	
Head of household worked in 2000	84.9%	0.358	84.1%	0.366	0.8%	
Head of household worked in 2001	86.7%	0.340	85.5%	0.352	1.2%	*
Sample size	6306		3628			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: ENCELURB, 2002

Table 3.12 - Means comparison of compliers and non compliers in treatment areas

Variable	Treatment		Control		Difference	
	Mean	SD	Mean	SD		
Household has 1-3 members	17.4%	0.379	24.3%	0.429	-7.0%	***
Household has 4-6 members	60.2%	0.490	54.3%	0.498	5.9%	***
Household has 7 or more members	22.4%	0.417	21.3%	0.410	1.1%	
Number of children in the household						
Ages 0 to 5	0.93	0.942	0.90	0.965	0.03	
Ages 6 to 10	0.98	0.940	0.76	0.897	0.22	***
Ages 11 to 15	0.78	0.915	0.62	0.872	0.16	***
Ages 16 to 20	0.42	0.715	0.46	0.760	-0.04	*
Number of children going to school						
Ages 0 to 5	0.11	0.319	0.09	0.295	0.02	**
Ages 6 to 10	0.92	0.916	0.70	0.872	0.22	***
Ages 11 to 15	0.66	0.846	0.45	0.747	0.21	***
Ages 16 to 20	0.12	0.381	0.10	0.356	0.02	***
Number of children who work						
Ages 0 to 5	0.00	0.000	0.00	0.000	0.00	
Ages 6 to 10	0.02	0.137	0.02	0.159	0.00	
Ages 11 to 15	0.08	0.323	0.05	0.252	0.03	***
Ages 16 to 20	0.06	0.280	0.06	0.274	0.00	
Poverty index	1.72	0.743	1.39	0.608	0.33	***
Poverty index squared	3.50	3.185	2.29	2.309	1.21	***
External shocks in the past year						
Death of a family member	12.6%	0.332	12.2%	0.327	0.4%	
Loss of employment of a member of the household	18.0%	0.384	15.7%	0.364	2.3%	
Loss of business	0.6%	0.076	0.3%	0.055	0.3%	**
Natural disaster or fire	4.9%	0.215	4.0%	0.197	0.8%	
Visited the doctor in the past year						
At least one child	30.0%	0.459	25.0%	0.433	5.1%	***
Head of household	11.0%	0.313	10.3%	0.304	0.7%	
Spouse of head of household	11.8%	0.323	10.3%	0.305	1.5%	
Characteristics of head of household						
Head of household is married or cohabiting	77.3%	0.419	74.0%	0.439	3.3%	**
Sex (male)	74.7%	0.435	76.0%	0.427	-1.3%	
Age	40.7	14.402	41.5	16.454	-0.8	*
Age squared	1859.8	1432.5	1991.6	1643.6	-131.8	***

Variable	Treatment		Control		Difference	
	Mean	SD	Mean	SD		
Currently working for money	80.1%	0.400	77.7%	0.416	2.3%	*
Spouse of head of household employed	15.4%	0.361	15.5%	0.362	-0.1%	
Head of hh. Can read/write	75.8%	0.428	76.9%	0.421	-1.1%	
Spouse of head of hh. Can read/write	54.8%	0.498	55.8%	0.497	-0.9%	
Schooling of head of household						
Incomplete primary	33.9%	0.474	29.0%	0.454	4.9%	***
Complete primary	19.5%	0.396	19.3%	0.395	0.2%	
Incomplete secondary	4.9%	0.216	6.0%	0.237	-1.1%	
Complete secondary	11.5%	0.319	12.4%	0.329	-0.8%	
More than secondary	28.7%	0.452	31.6%	0.465	-2.9%	
Characteristics of spouse of head of household						
Incomplete primary	27.4%	0.446	23.3%	0.423	4.1%	
Complete primary	17.5%	0.380	18.9%	0.392	-1.4%	***
Incomplete secondary	3.9%	0.193	4.4%	0.205	-0.5%	
Complete secondary	8.8%	0.283	10.9%	0.312	-2.2%	
More than secondary	17.9%	0.383	15.7%	0.364	2.2%	*
Head of household worked in 1999	84.1%	0.365	82.0%	0.384	2.1%	*
Head of household worked in 2000	85.7%	0.350	83.5%	0.371	2.2%	**
Head of household worked in 2001	87.6%	0.329	84.6%	0.361	3.1%	***
Sample size	3,255		1,635			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: ENCELURB, 2002

Table 3.13 - Means comparison of compliers in treatment and compliers in control groups

Variable	Enrolled (complier)		Not Enrolled (not complier)		Difference	
	Mean	SD	Mean	SD		
Household has 1-3 members	17.4%	37.9%	14.1%	34.9%	3.2%	***
Household has 4-6 members	60.2%	49.0%	57.3%	49.5%	2.9%	*
Household has 7 or more members	22.4%	41.7%	28.6%	45.2%	-6.2%	***
Number of children in the household						
Ages 0 to 5	0.93	0.94	1.09	1.07	-0.15	***
Ages 6 to 10	0.98	0.94	1.03	0.95	-0.05	
Ages 11 to 15	0.78	0.91	0.74	0.92	0.04	
Ages 16 to 20	0.42	0.71	0.43	0.77	-0.01	
Number of children going to school						
Ages 0 to 5	0.11	0.32	0.13	0.35	-0.02	
Ages 6 to 10	0.92	0.92	0.99	0.93	-0.06	**
Ages 11 to 15	0.66	0.85	0.61	0.84	0.05	*
Ages 16 to 20	0.12	0.38	0.11	0.38	0.01	
Number of children who work						
Ages 0 to 5	0.00	0.00	0.00	0.00	0.00	
Ages 6 to 10	0.02	0.14	0.02	0.20	-0.01	
Ages 11 to 15	0.08	0.32	0.06	0.29	0.02	*
Ages 16 to 20	0.06	0.28	0.05	0.27	0.01	
Poverty index	1.72	0.74	1.64	0.76	0.08	***
Poverty index squared	3.50	3.18	3.25	3.32	0.25	**
External shocks in the past year						
Death of a family member	12.6%	33.2%	9.8%	29.7%	2.8%	***
Loss of employment of a member of the household	18.0%	38.4%	11.2%	31.6%	6.7%	***
Loss of business	0.6%	7.6%	0.8%	8.9%	-0.2%	
Natural disaster or fire	4.9%	21.5%	3.1%	17.2%	1.8%	***
Visited the doctor in the past year						
At least one child	30.0%	45.9%	26.4%	44.1%	3.6%	**
Head of household	11.0%	31.3%	10.1%	30.2%	0.9%	
Spouse of head of household	11.8%	32.3%	9.7%	29.6%	2.1%	**
Characteristics of head of household						
Head of household is married or cohabiting	77.3%	41.9%	81.4%	39.0%	-4.1%	***
Sex (male)	74.7%	43.5%	82.0%	38.4%	-7.3%	***
Age	40.7	14.4	42.0	15.1	-1.3	***

Variable	Enrolled (complier)		Not Enrolled (not complier)		Difference	
	Mean	SD	Mean	SD		
Age squared	1859.8	1432.5	1989.5	1535.3	-129.7	***
Currently working for money	80.1%	40.0%	79.8%	40.2%	0.3%	
Spouse of head of household employed	15.4%	36.1%	12.3%	32.8%	3.1%	***
Head of hh. Can read/write	75.8%	42.8%	80.3%	39.8%	-4.5%	***
Spouse of head of hh. Can read/write	54.8%	49.8%	63.7%	48.1%	-8.9%	***
Schooling of head of household						
Incomplete primary	33.9%	47.4%	30.7%	46.1%	3.2%	**
Complete primary	19.5%	39.6%	23.7%	42.5%	-4.2%	***
Incomplete secondary	4.9%	21.6%	5.2%	22.3%	-0.3%	
Complete secondary	11.5%	31.9%	15.7%	36.4%	-4.1%	***
More than secondary	28.7%	45.2%	23.2%	42.2%	5.5%	***
Characteristics of spouse of head of household						
Incomplete primary	27.4%	44.6%	24.5%	43.0%	2.9%	**
Complete primary	17.5%	38.0%	22.9%	42.0%	-5.3%	***
Incomplete secondary	3.9%	19.3%	3.1%	17.2%	0.8%	
Complete secondary	8.8%	28.3%	11.8%	32.3%	-3.0%	***
More than secondary	17.9%	38.3%	17.8%	38.2%	0.1%	
Head of household worked in 1999	84.1%	36.5%	83.5%	37.2%	0.7%	
Head of household worked in 2000	85.7%	35.0%	83.5%	37.2%	2.2%	*
Head of household worked in 2001	87.6%	32.9%	85.0%	35.7%	2.7%	**
Sample size	3,255		1,245			

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: ENCELURB, 2002

Table 3.14 -AIT and ATT on the likelihood and amount of private transfers given and received in male headed households

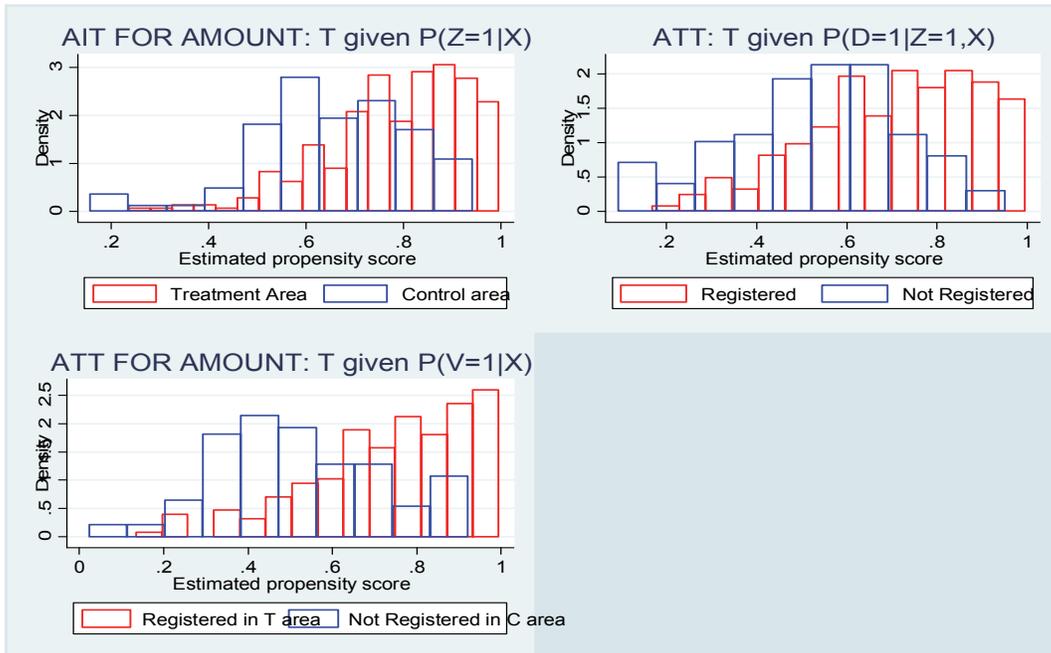
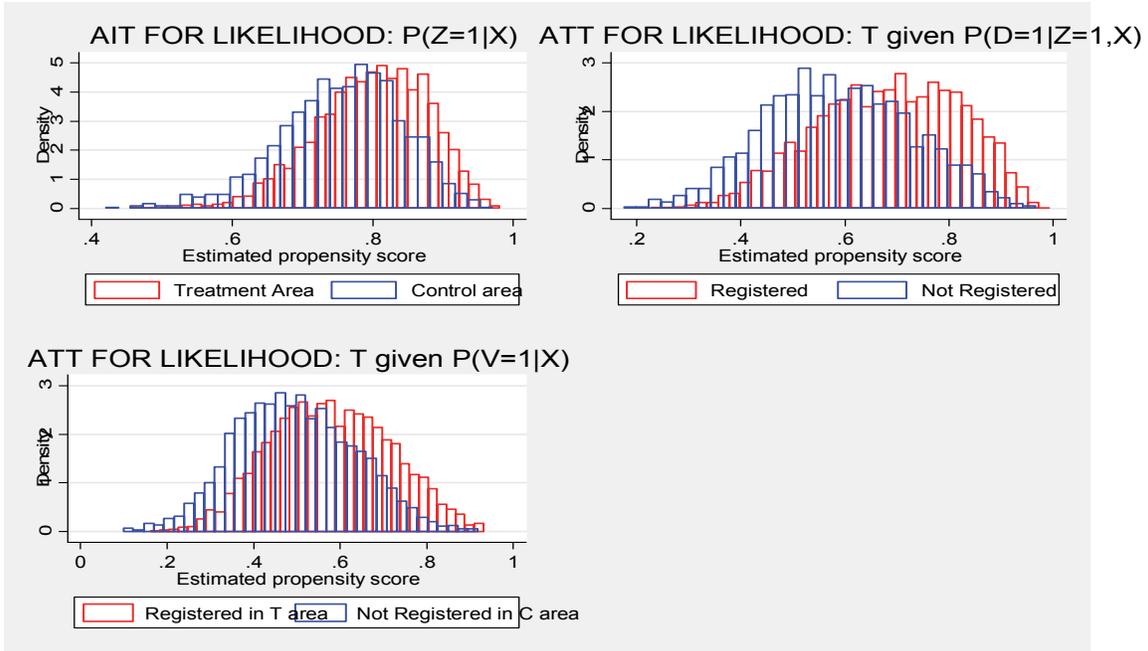
Received transfers (SE in parenthesis) – Male hoh						
	Likelihood of receiving transfers			Amount Received		
	(1)	(2)	(3)	(4)	(5)	(6)
Matching method	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)	AIT P(Z=1 X)	ATT P(D=1 Z=1)	ATT P(V=1 X)
Stratification	0.024 (0.021)	-0.038 (0.020)*	0.017 (0.023)	-302.3 (436.3)	-619.6 (565.4)	-537.2 (501.1)
	n _T =3678 n _C =1068	n _T =2433 n _C =1237	n _T =2433 n _C =1013	n _T =788 n _C =229	n _T =561 n _C =213	n _T =561 n _C =214

Level of significance: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Data: ENCELURB, 2002

Appendix 3.2

Area of common support: Private transfers given



Research and Policy Implications

In Mexico as well as much of the developing world, older adults are quickly becoming a substantial proportion of the population. For many older adults, the limited access to social security and pensions play an important role in explaining the involvement of children in their parent's financial support. Furthermore, among the oldest old the higher burden of disease and of physical limitation requires children to provide personal care, in addition to financial assistance.

There are two implications from this. First, children who provide for their parents might still support children of their own and are close to or are facing their own transition to retirement and old age. Therefore, unlike younger adults, the children of the oldest old face different trade-offs when assigning resources to care for their parents. Second, the greatest need for financial support and care among the oldest old is likely to come from the low socioeconomic status groups, where health outcomes tend to be worse and access to pension and health care limited.

From a policy perspective, long term solutions require giving younger generations to be able to access to the pension savings system as well as creating policies that support the involvement of family members in the provision of personal care for frail and the oldest old group. Both policies, savings for retirement and incentives to provide care, go hand in hand. The increasing life expectancy and number of older adults implies that, over time, more adults will be facing the life transitions that come with retirement age while providing care for their parents. Access to pension savings mechanisms would help ease such transition and reduce the existing trend of old age income insecurity and poverty. An implication of this is that access to pension savings requires involving individuals in the informal sector, as well as individuals performing unpaid work.

Incorporating families as part of policies to improve quality of care for the oldest old has important implications at the country level. Mexico, as any other nation, faces limited resources to address the needs of its aging population. Policies that make efficient use of such limited resources can incorporate the existing family safety net as part of programs that assist children to provide personal care for the oldest old over the long haul by compensating caregivers for their forgone labor earnings. Such policies can (i) target female-headed households in which the head of household or other family member is the caregiver for older adult. Given the effectiveness of conditional cash transfer programs in improving health outcomes, financial incentives that would compensate for women's or other caregiver's foregone earnings can be conditioned on regular checks for both the parent and the child or children providing care.

This dissertation has broadly discussed the role of public policies on private transfer decisions. As research on this area moves forward, it is key for it to inform policy makers about the aspects of different programs (such as the implementation processes and participation requirements) that have influenced the extent of the crowding out of private transfers. The current trend in developing economies towards diverse forms of conditional cash transfer programs, and past evidence about crowding out, shows substantial differences across programs and beneficiaries that could give additional perspective about how different public programs interact with private transfers decisions. For example, programs that target old age income security and health coverage could have different impacts depending on the amount of the support, type of support (e.g., food, cash) and the quality of follow up with beneficiaries to track the program goals. As investments in programs of this nature grow, so does the need of introducing the program's characteristics in the assessment of family transfers. Lessons from such research would inform future public initiatives about how to prevent or minimize the displacement of private support.