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MOTIVES FOR INTERGENERATIONAL TRANSFERS: EVIDENCE FROM MALAYSIA*

LEE A. LILLARD AND ROBERT J. WILLIS

In this paper we discuss a number of hypotheses about motives for intergenerational transfers within the family. We use data on time and money transfers between generations in Malaysia, where there is neither Social Security nor Medicare, to explore these hypotheses empirically. We find evidence supporting the hypotheses that children are an important source of old age security and that old age security is, in part, children's repayment for parental investments in their education. This repayment is partly a function of the children's income and, in the case of females, a function of their spouse's income. We also find evidence supporting the hypotheses that parents and children engage in the exchange of time help for money.

The family is the central social institution within which decisions are made concerning fertility, investments in the human capital of children and adults, and the distribution of a family's resources between generations, and between spouses and siblings within generations. Intergenerational transfers from productive middle-aged family members to the dependent young and old or from the lucky to the unlucky help smooth the consumption of all members over the life cycle and across uncertain states of the world. Transfers also help insure the future productivity of family members by facilitating investment in the human capital of the young. In the United States and other developed countries, market institutions (e.g., employer-provided pensions and health insurance) and tax supported public institutions (e.g., public education, social security, and health insurance) may substitute for the family. In Malaysia, however, pensions and health insurance from either the private or public sector are largely nonexistent; so if these functions are performed at all, the family is likely to be chiefly responsible.

MOTIVATION FOR TRANSFERS WITHIN FAMILIES

A number of hypotheses have been advanced concerning the motivation for transfers within families and, given the moti-

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vation, the observable relationships one might expect to see between variables characterizing family members who give and receive transfers. In this section, we shall briefly review some of these hypotheses.

Old Age Security Hypothesis

The old age security hypothesis is one of the oldest hypotheses about intergenerational transfers in the literature (see Willis 1980 and references therein). The usual argument emphasizes the problems that individuals face in finding a reliable outlet for saving for old age in developing countries where financial institutions are primitive, property rights are insecure, the currency is subject to inflation, and government social security schemes, private pensions, and health insurance are nonexistent.

With alternative forms of asset accumulation foreclosed, individuals are hypothesized to rely on transfers from their children for old age security. Although children themselves are risky investments—they may die, be the wrong sex, be economic failures, or be disloyal—according to the hypothesis they represent the only chance for common people in poor countries to have any security in old age. Children may provide security in a number of forms, including monetary transfers, help with housework, and care if the parent is frail or ill. Because the risks involved in relying on children and on savings are to some extent independent, one might expect an optimally diversified portfolio to include both children and nonhuman assets. As economic development takes place, markets emerge, and society develops ever more sophisticated financial institutions, the old age security hypothesis suggests that the economic benefits of having children will wither away; thus fertility will decline as parents rely increasingly on market and public sector methods and rely less on old age transfers from their children.

Superficially, the experience of Malaysia fits this scenario quite well. It has neither significant public social security programs nor extensive employer-provided private pensions. Thus, for the most part, individuals must rely on themselves or their families for old age support and, as we show later, adult children provide significant monetary transfers to their elderly parents—especially to widowed mothers. Moreover, as Malaysia's rate of economic growth has accelerated in the past two decades, fertility has declined substantially. The primary difficulty in applying the traditional old-age security model to a country like Malaysia is that there is no evidence that it has inadequate outlets for savings. Indeed Malaysia belongs with the other "Asian Tigers," such as

South Korea, Taiwan, and Japan, that have achieved extraordinary rates of economic growth in large part because of their extraordinarily high savings rates (see Krueger 1995). Yet in all these societies, parents are perceived to rely on their children for support during old age.¹

Parental Repayment Hypothesis

An alternative theory, which we shall call the "parental repayment hypothesis," emphasizes borrowing rather than saving constraints. Because it is difficult for individuals to borrow against their future income in the market, this hypothesis postulates that there is an implicit family capital market in which parents finance human capital investment in their children through a combination of grants and loans and, in return, children implicitly repay the loan component by providing old age support for their parents. In particular, consider the Becker and Tomes (1976) model of parental investment in their children's human capital. In this model, children's earning capacity as adults depends on the amount of investment they received during childhood in the form of parental time and expenditure devoted to their health and education. Parents have a budget determined by their own labor income, land ownership, and other capital. They allocate this budget to their own current consumption, expenditure on the consumption and investment of their children, and savings for their old age on which they receive a return equal to the market interest rate.

An efficient family investment program would maximize the joint wealth of the parents and children by carrying investment in the children's human capital to the point at which the marginal rate of return is equal to the market interest rate. The distribution of welfare between the parents and children is then determined by intrafamily transfers. If parents are altruistic toward their children and they are rich, parents will tend to pay the full cost of their children's human capital and perhaps to add a sizable monetary bequest.

In a rapidly developing country such as Malaysia, parents' incomes will tend to be low relative to their children's incomes. For instance, if real per capita income growth is 4% per year and the mean length of a generation is 25 years, then the typical child will have a lifetime income that is nearly three times as high as that of his or her parent. Moreover, because of Engel's Law, the composition of economic activity tends to shift away from agriculture toward industry and services as economic development proceeds. As a consequence, the relative demand for more skilled and better-educated labor tends to increase (Willis 1994).² In this context, the efficient investment program requires parents to devote an increasing portion of their income to investment in

children which, given the parents' low income, places pressure on them either to sacrifice their own current consumption or to jeopardize their old age consumption by reducing their savings. One possible margin of adjustment is fertility reduction, and another is for parents to shift a portion of their retirement portfolio away from monetary savings toward investment in their children's human capital. Of course, if the purpose of this portfolio shift is to improve the parents' prospects for old age consumption, they must expect that the children who receive the increased investment during childhood will share some of the fruits of this investment with their parents in the form of old age support. According to this hypothesis, we expect to see a strong relationship between children's education and the transfers they make to their parents.

Risk and Insurance

Dealing with risk is one of the great challenges facing households in developing countries. Recent research suggests that whereas households in low income countries face considerable income risk, they are surprisingly effective in smoothing consumption through a variety of market and nonmarket institutions for sharing and spreading risks.³ The family is one such institution. Intrafamily transfers may help smooth consumption across uncertain states of the world by offering family members implicit insurance. To the extent that family members face risks that are correlated imperfectly with the risks faced by other family members, a family agreement to pool risks may lower substantially the riskiness of each member's consumption. For example, Kotlikoff and Spivak (1981) show that a pooling agreement between a husband and wife in which each provides for a bequest to the other may reduce risk, but less than would a fair market annuity that involves pooling risks over a very large population. In our empirical work, we investigate the sensitivity of transfers to transitory variations in income, and estimate the correlations of transfers across family members.

Altruism Hypothesis

Becker (1974, 1991) and others have advanced the hypothesis that family members have altruistic feelings toward one another as a key ingredient in explaining many aspects of family behavior. For example, an altruistic "head of the household" who controls all of a family's resources will transfer resources to other family members so as to maximize a weighted sum of the utility functions of all family members. This allocation of family resources is efficient, and it "automatically" provides family members with the benefits of consumption-smoothing over the life cycle and across uncertain states of the world that otherwise would require actions such as borrowing and lending or the purchase of market insurance. In addition, because of the head's altruism, other family members receive net transfers. In the

1. For example, see Lee, Parish, and Willis (1994) for evidence and analysis of patterns of intergenerational transfers in Taiwan.

2. Lillard and Willis (1994) show that the education of cohorts born early in the century averaged about four years for males and two years for females. Educational attainment grew steadily over successive cohorts and relatively more rapidly for females to reach an average of about eleven years for both sexes by the birth cohort of 1980. Lillard and Kilburn (1995) present evidence on the returns to education in Malaysia.

3. For an up-to-date summary of theory and evidence in this area see the papers by Townsend (1995), Morduch (1995), and Besley (1995), which appeared in a symposium on consumption-smoothing in the developing countries in the *Journal of Economic Perspectives*.

context of the Becker-Tomes (1976) model of family investment in children's human capital, the more altruistic the household head, the more he finances investments in his children's education through gifts and the less he requires repayment. Whereas most discussions of altruism implicitly assume homogeneity of preferences, there may be variation among families in the degree of altruism among members and in the extent of transfers in a number of dimensions, an issue we address empirically.

It is difficult to distinguish empirically between transfers that arise because of altruism and transfers that reflect efficient contracting among family members. For example, an efficient insurance contract would lead to the same type of redistribution of family income from lucky to unlucky family members that would be chosen by an altruistic household head. The main difference is that a pure insurance scheme would be actuarially fair (or mildly "unfair" if there are administrative costs to cover), whereas the beneficiaries of an altruist receive a net transfer because the expected value of transfer receipts exceeds the value of their contribution to family income. Unfortunately we do not have data that would permit us to determine, for example, whether parents spend more on childrearing than they receive from the child as old age support, or whether the transfer a family member receives when his transitory income is low in one period is offset by transfers that family member pays in other years when his income is unusually high.

Exchange Motive for Transfers

Alternative models of intrafamily transfers are based on exchange rather than on consumption-smoothing motives. In a well-known paper, Cox (1987) argues that if parental transfers to children represent implicit payment for services children provide to parents and these services are demanded inelastically, parents would tend to transfer more to their relatively high income children whereas, as noted above, altruistically motivated parents will transfer less. If the services a given child provides are a good substitute for services other children provide or for services available in the market, transfers within the family will tend either to go toward the child who can provide the services most cheaply—possibly a low income child with a low opportunity cost of time—or to disappear in the denser markets of urban areas. Because our data contain records of both transfers and certain services (childcare help and housework help), we will be able to test directly for evidence of links between transfers and service provision.

Bargaining Power in the Household

Recently economists have begun to find ways to peer inside the "black box" of household economies to make inferences about the distribution of economic welfare between husbands and wives: They have examined how the composition of household consumption is influenced by the spouse's control of resources (see, for example, Thomas (1990) and Schultz (1990)). The basic idea is that the spouse with more bargaining power will command a larger share of household con-

sumption. If preferences differ between the spouses, evidence of varying shares of total consumption (an unobservable variable) is obtained by examining observable changes in the pattern of household consumption. For example, if in comparison to fathers mothers are more altruistic toward children, an increase in the mother's earnings capacity or wealth ownership—which is assumed to increase her bargaining power—will lead to a larger proportion of the household's income being spent on children's goods.

Data on transfers offer an opportunity to test for the existence of bargaining power. For instance, in a study using data from Taiwan, Lee et al. (1994) find that transfers from a married couple to the wife's parents are more sensitive to the wife's income than to the husband's income—a result consistent with the hypothesis that improved market earnings potential increases the wife's bargaining power. Our data will permit us to test for this effect in Malaysia.

Gender Differences

The effect of gender on parental investments and returns from children has been an important issue in many Asian societies. In Chinese culture, for example, traditionally sons are relied upon for old age support whereas daughters leave their family of origin upon marriage to become part of their husband's family. This pattern is often invoked as an explanation for greater investment in the education of sons relative to daughters.⁴

In this paper, we will investigate how transfers (made to and received from) differ across sons and daughters in Malaysia. In particular, the parental repayment hypothesis suggests that parents who make investments in a daughter's education may expect to receive transfers in return. Daughters may acquire the resources to make such repayments through their own earnings or through a better marriage. This hypothesis may provide an alternative to the bargaining power hypothesis to explain the difference in the effects of male and female income on transfers to parents on each side of the family.

DATA AND DESCRIPTIVE STATISTICS

In this study we use information on transfers from the 1988 Malaysian Family Life Survey (MFLS-2). The survey provides a rich source of current and retrospective economic and demographic information, which we exploit in order to gain perspective on intergenerational transfers. One feature of the data that is particularly advantageous for this study is that the survey collected detailed information about *inter vivos* transfers during the 12 months before the survey—including the presence of money and/or time transfers and the amount of money transfers. The survey included questions about transfers to and from generations both above and below the reporting generation. We use this information to consider transfers from the perspective of the respondent as both a parent and a child.⁵

4. For skeptical analyses of this claim, see Greenhalgh (1985) and Parish and Willis (1993).

5. The full sample contains 3,753 households for which there is at least one eligible parent (alive and non-coresident) for either member of a mar-

The first perspective from the parents' viewpoint considers the total transfers given to or received from all the non-coresident adult children (over age 18) of a parent couple, or the surviving spouse if the other spouse has died.⁶ A basic requirement for *inter vivos* transfers between parents and their adult children is that there must be at least one eligible adult child. Panel A of Figure 1 shows the life cycle pattern of having at least one eligible child. The fraction of couples with eligible children rises rapidly after age 35, reaching a peak at age 45 and remaining high thereafter. The number of eligible children also rises monotonically over the life cycle. The life cycle pattern of the probability of giving money transfers to eligible children and receiving money from children (as a group), shown in Panel B, clearly illustrates the tendency to transfer to children early in the life cycle and to receive from children later in the life cycle. Parents are more likely to receive money transfers from children, and over a longer period of the life cycle, than they are to give money to children. The mean positive transfer amount is reported in Table 1.

Whereas the figure shows transfers for households both with and without eligible children, our analyses are based on those with at least one eligible child. Table 1 shows that there are 1,717 households with eligible adult children in the sample, and displays some descriptive statistics on transfers to and from children. One of the clearest patterns of transfer behavior is that the direction of flow of *inter vivos* monetary transfers is predominantly from the younger to the older generation in Malaysia. As illustrated in Table 2, however, the mean level of transfers (including zeros) as a share of household income is fairly small.

The parent perspective has the advantage of capturing all transfers given or received by the older generation within a family, and enables us to examine how transfers depend on the economic and demographic circumstances of the older generation. It also enables us to see how transfers depend on the number and characteristics of all the children of a couple or surviving spouse. This perspective has three major limitations, however. First, it provides only limited information about the economic and demographic circumstances of each child: We know only the child's sex, age, current enrollment status, and highest level of education. Second, the transfers given to or received by an individual child are not identified. Third, we do not know the child's marital status nor, if the child is married, do we know what transfers have been given to or received from parents of the child's spouse. We address these issues next.

The second perspective is from the viewpoint of the (respondent) child and his or her spouse. Each survey asks a

female respondent about transfers given to or received from her (living and non-coresident) parents and, in a separate spouse interview, asks the husband about transfers given to or received from his (living and non-coresident) parents. From this perspective, we can examine how a couple's decisions about transfers involving both the husband's and the wife's parents are influenced by the economic and demographic circumstances of the couple and by their individual economic labor force activities and earnings. For this analysis we include only couples so that the decision-making unit is always comparable.

A basic requirement for *inter vivos* transfers between an adult child and his or her parents is that there must be a surviving non-coresident parent. Panel A of Figure 1 shows the life cycle patterns of the wife having at least one non-coresident living parent and of the husband having at least one non-coresident living parent. A couple is most likely to have eligible parents while relatively young, peaking around ages 25–30, after which the probability of having surviving parents declines.

From the perspective of the younger child generation the life cycle pattern of transfers to and from their parents is reflected in Figure 1; the figure reports transfers for a married couple to and from the wife's parents (Panel C) and to and from the husband's parents (Panel D). The overall patterns indicate, again, that transfers are more likely to flow from the younger to the older generation and that compared to wives, husbands transfer to their parents at a higher rate.

Whereas the figure shows transfers for households both with and without eligible parents, our analyses are based on those with at least one eligible parent. Table 1 shows that there are 2,053 couples for which the wife's parents are eligible and 1,740 couples for which the husband's parents are eligible, and displays some descriptive statistics on transfers for various combinations of eligible parents. There are 1,433 households with *both* sets of parents eligible for transfers and 2,360 households for which *either* his or her parents are eligible.

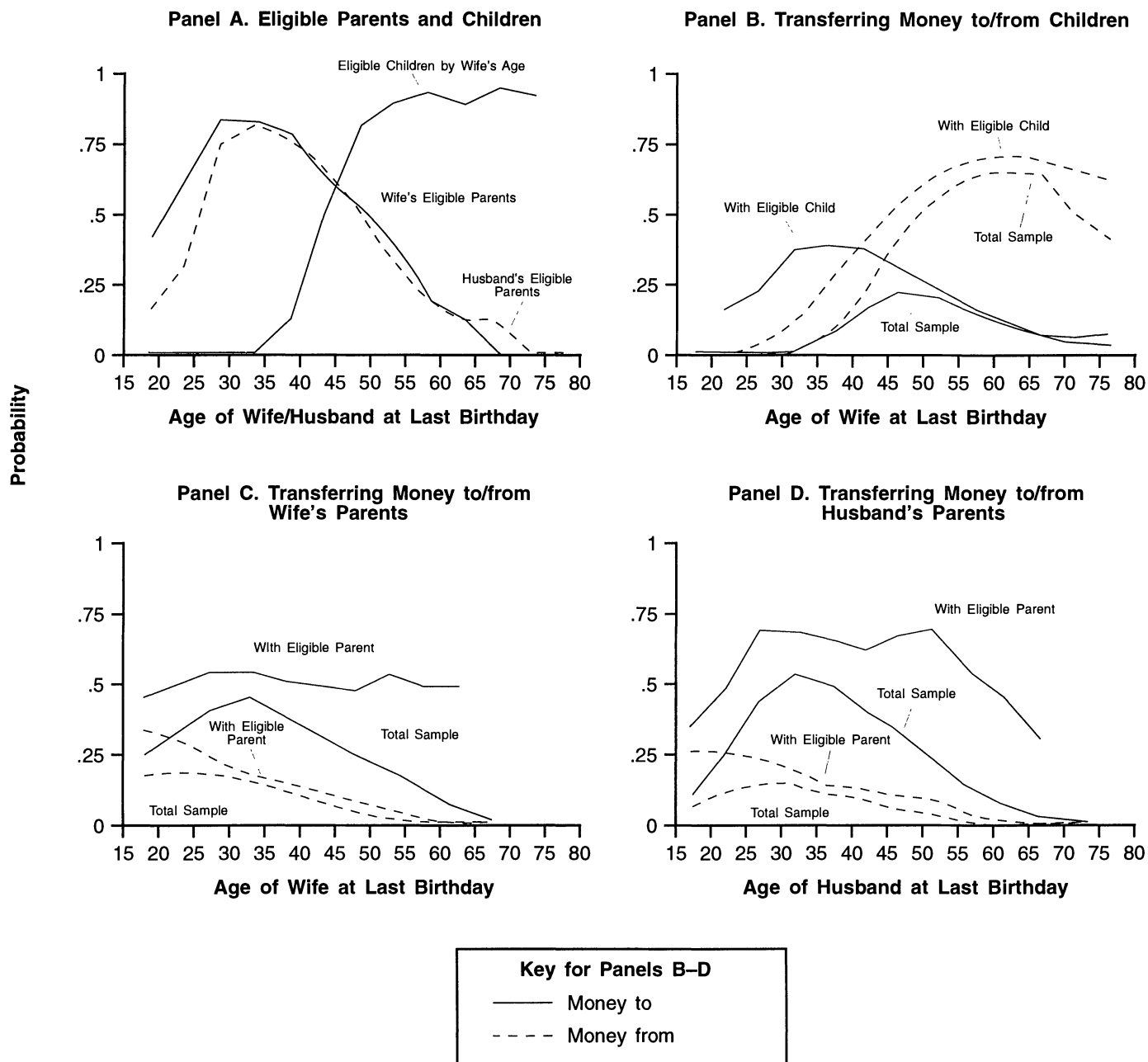
One weakness of this perspective is that we have limited information about each spouse's parents: We know only whether the mother and father of each spouse is living, their age, and their education, but we do not have detailed information about their incomes. Another limitation is that we do not know about transfers that the parents receive from the husband's and wife's siblings. We know, however, the number, sex, and age of the husband's and wives' siblings, although we do not know their marital status, education, or income.

We have information only about transfers between non-coresident parents and children. Because coresidence decisions may be endogenous, we estimated transfer models allowing for self-selection into coresidence (both in terms of the eligibility of a set of parents and in terms of coresidence with the spouse's parents), and found no significant evidence of selection bias or endogeneity of coresidence. We, therefore, treat it as exogenous in the specifications that follow.

ried couple or at least one eligible child (at least age 18 and non-coresident). The sample contains relatively few households with both parents and children eligible, so we do not pursue the combination.

6. This sample includes both married couples and unmarried women. The original 1976 MFLS sampled ever-married women, so women are more likely to be included. There was an insufficient number of unmarried men in the new sample partly due to higher mortality among men for their inclusion in this analysis.

FIGURE 1. PROPORTIONS ELIGIBLE AND MONEY TRANSFERS OVER THE LIFE CYCLE



Other potentially endogenous variables we treat as exogenous are the number of children from the parents' perspective and number of siblings from the child's perspective. When respondents are parents but have eligible children (at least one non-co-resident child over age 18) their fertility may not be complete at the time of the interview; so number of children may not be the appropriate measure for younger par-

ents. Because we did not find evidence of endogeneity of coresidence or of time transfers in the money transfer equations (discussed below), treating of number children as exogenous may not be inappropriate; but this is clearly a subject for further research.

A second important feature of the data for our analysis of transfers is that it includes information on wives' work

TABLE 1. SAMPLE SIZES AND DESCRIPTION OF TRANSFERS

	Parent Perspective: Transfers with All Children over Age 18			
	Percentage		Amount (\$U.S.) ^a	
Money Transfers				
Money to children	23.6		726.15	(5.2)
Money from children	61.5		496.34	(5.3)
Time Transfers				
Housework to children	8.3			
Housework from children	17.1			
Childcare to children	22.0			
Number with Eligible Children		1,717		
	Child Perspective: Transfers with Parents			
	Wife's Parents		Husband's Parents	
	Percentage	Amount (\$U.S.) ^a	Percentage	Amount (\$U.S.) ^a
Money Transfers				
Money to parents	54.3	209.71	68.5	331.26
		(4.6)		(5.1)
Money from parents	18.5	128.35	15.9	248.49
		(4.0)		(4.1)
Any Time Transfers				
Housework to parents	22.8		22.1	
Housework from parents	13.4		8.0	
Childcare from parents	23.0		16.1	
Number Eligible Parent Sets		2,053		1,740

^a\$1 U.S. \equiv 2.57 Malay ringgits.

and earnings (i.e., never worked, not currently working, and current monthly earnings) and a full earnings history for husbands,⁷ facilitating the measurement of permanent and transitory income⁸ and of other income sources to measure current total household income. Although the quality of retrospective data—possibly going back as far as 30 years in some cases—may be questionable, Lillard and Kilburn (1995) examine the retrospective earnings data from both the MFLS-1 and the MFLS-2 in the context of intergenerational links in the earnings. They find that the observed life cycle profiles

7. Men were asked to give a complete retrospective history of work and earnings beginning with their first job. Reported figures are in real values using government statistics on prices over time.

8. The method of measurement of permanent earnings is discussed more fully in Lillard and Kilburn (1995). It consists of age-adjusted mean monthly earnings over the work life, including an allowance for retrospective reporting error. Transitory earnings are measured as the deviation of current earnings from permanent earnings.

appear reasonable. In addition, our analysis explicitly incorporates measurement error with variance which depends on the recall period.

MODEL AND RESULTS: RESPONDENTS AS PARENTS

From the perspective of respondents as parents, information on transfers includes money and time both to and from their eligible children (i.e., non-coresident children aged over 18) as a group, reported by the female respondent.

“In the past 12 months [did] any of your children who are over 18 and not living with you do any of the following things to help out you (or your husband)—either on a regular basis or, for example, when you were sick or needed financial or other assistance? Did they:

- A. Give you money or help pay your bills or pay for housing?
- B. Give you food or other goods?

TABLE 2. MONEY TRANSFERS AS A SHARE OF HOUSEHOLD INCOME

Money to Parents/Giver's Household Income (%)	
Only wife's parents eligible	2.4
Money to wife's parents	2.9
Only husband's parents eligible	4.3
Money to husband's parents	6.1
Money to parents, Wife's and Husband's Parents Eligible	9.2
Money from Children/Parent's Income (%)	
	7.8

Note: These figures include zero amounts.

C. Take care of your younger children without pay?

D. Do household chores or provide personal care?...

If Type A or B (Money or Goods): What is the total value of (type help) that you (or your husband) have received from your children in the last 12 months?"

An analogous set of questions was asked about time and money help provided to the same set of children. The answers to these questions translate into five transfer equations described as follows.

Any money to children, and log amount if positive. A probit function indicates whether there was a positive transfer of money (A or B) to non-coresident adult children,

$$MTC = \begin{cases} 1 & \text{if } \alpha'_{mic} X + v_{mic} > 0 \\ 0 & \text{otherwise} \end{cases},$$

and if so the (log) amount of money (A and B) is given by,

$$\ln A_{mic} = \beta'_{mic} X + u_{mic}.$$

Any money from children, and log amount if positive. A probit function indicates whether there was a positive transfer of money (A or B) from all non-coresident adult children as a group,

$$MFC = \begin{cases} 1 & \text{if } \alpha'_{mfc} X + v_{mfc} > 0 \\ 0 & \text{otherwise} \end{cases},$$

and if so the (log) amount of money (A and B) is given by,

$$\ln A_{mfc} = \beta'_{mfc} X + u_{mfc}.$$

Any housework time from children. A probit function indicates whether there was a transfer,

$$TFC = \begin{cases} 1 & \text{if } \alpha'_{tfc} X + v_{tfc} > 0 \\ 0 & \text{otherwise} \end{cases}.$$

All stochastic terms are assumed to be distributed normally.

Results

Estimates of the parameters of these five equations are presented in Tables 3 and 4. There are no exclusion restrictions to identify selection into positive transfers, so the probit and log amount equations are estimated separately. We found no

evidence for correlation in the propensities to give and to receive or in the amounts given and received.⁹

Transfers of Money To Children (MTC). By far the largest and most significant predictor of any transfer and of the amount of transfer over the last 12 months is the number of children enrolled in high school or college. It is not uncommon in Malaysia to foster one's child with a relative (perhaps an older sibling) who resides near a high school (thus making him or her non-coresident) so that the child may attend school while providing financial assistance to the foster family. Generally results are similar for sons and daughters in college, but when differences are significant they favor sons.

The parents' resources matter in transfers to children. If the mother is not working, the parents are less likely to make a transfer to their children; but if a transfer occurs the amount is unaffected by a mother's working status. The amount of a positive transfer to the children increases with the earnings of both the father and the mother, but a positive transfer is no more likely with higher earnings.

More educated parents transfer more money to their children. Chinese parents are less likely than Malay parents to make transfers to their children, but transfer larger amounts when they make them. Indian parents are more likely to make transfers and to transfer more.

Transfers of Money From Children (MFC). The most important and statistically significant relationships in money transfers to parents from their children are related to the number of non-coresident children and their education. First, the probability of receiving transfers declines with the number of children in school. Parents give these children transfers rather than receive them.

The number of non-coresident children who have completed their schooling and their education level are important determinants of transfers. The effects of the number of children only (no high school or college graduates) on the probability of a transfer $\Phi(\alpha'_{mfc} X)$ and on the expected transfer amount $\Phi(\alpha'_{mfc} X) \times \exp(\beta'_{mfc} X + .5\sigma^2_{u_{mfc}})$ are presented in the first three rows of Table 5. There is a significant increase of about six percentage points in the probability of a transfer, for each two additional children (i.e., as the number of children increases from one to three to five). There is a corresponding small increase in the expected transfer of about \$13 per two children.

Next consider the *additional* effect of the children's education on transfers. Compared with number of children, education has a more substantial effect on expected transfers as illustrated in the remaining rows of Table 5, which compare changes in only the education of children, assuming that there are three sons in each case. The reference case

9. Equations, including "any" and "amount" equations, were estimated jointly pairwise, using functional form for identification. Each correlation was positive, but not near statistical significance, and no substantive results were affected. In the next section on transfers to parents we are better able to identify correlation across transfer equations.

TABLE 3. MONEY TRANSFERS TO ALL ADULT NON-CO-RESIDENT CHILDREN

	Any Money (MTC)	Log Amount (ln A_{mtc})
Children's Characteristics		
Number of children in high school	0.4344*** (0.0894)	0.2959 (32.9199)
Number of sons in college	1.0625*** (0.0925)	1.3433*** (0.2094)
Number of daughters in college	1.3334*** (0.1456)	0.9430*** (0.2162)
Parents' Characteristics		
Wife's education	0.0589*** (0.0136)	-0.0160 (0.0340)
Husband's education	0.0482*** (0.0122)	0.0731** (0.0326)
Log wife's monthly earnings	0.0711 (0.0502)	0.2968*** (0.1122)
Wife not working	-0.3434*** (0.0770)	0.0090 (0.1878)
Log husband's monthly earnings (current)	-0.0449 (0.0450)	0.1638* (0.0948)
Chinese	-0.2193** (0.0965)	0.9976*** (0.2318)
Indian	0.2236** (0.0948)	0.9338*** (0.2634)
Intercept	-1.2384** (0.4989)	-0.0137 (1.1326)
σ_{umtc}		1.2089*** (0.0742)

Note: Standard errors are in parentheses.

*** $p < .01$; ** $p < .05$; * $p < .10$

(from above) is three sons with no high school or college graduates. The probability of a transfer and the expected amount increases substantially as more sons become high school graduates; the probability increases by 18.5 percentage points, and the expected amount increases by \$233 for three high school graduates compared to no high school graduates. The effects of having a college graduate son are even larger.

Transfers parents receive from non-co-resident children are not affected by coresidence with a son or daughter (and the coresidence variables were not endogenous) or the number of co-resident children. This provides a first bit of evidence that the behavior of siblings has little effect on transfers.

The parents' financial resources influence monetary transfers from children. Parents are less likely to receive transfers the greater the father's earnings and (if the mother is working) the greater the mother's earnings. The amount of

transfers is greater if the mother is not working. A puzzling result is that the amount of transfers increases with the father's earnings, mainly related to permanent earnings (based on results not shown).

Chinese parents are more likely than Malay parents both to receive transfers and to receive larger amounts. Indian parents receive significantly larger amounts when transfers occur, but are less likely to receive them.

Transfers of Time (Help with Housework) From Children (TFC). Whereas time transfers rise with the mother's age, little else matters in these equations, except that Chinese parents are significantly less likely to receive time help. Importantly there are no effects of household income of the recipient—neither of its composition in terms of who earned it nor of father's lifetime permanent earnings.

Time transfers are not affected by the number and education on non-co-resident children, but money transfers are. This finding is consistent with the idea that monetary transfers are repayment for educational investments rather than that education increases one's preferences for helping one's parent.

MODEL AND RESULTS: CHILD'S PERSPECTIVE

From the perspective of respondents as children, information on transfers includes money and time both to and from parents, reported separately by the husband and by the wife about his or her own eligible (living, non-co-resident) parents. The following is an illustrative question about transfers:

"In the past 12 months have you (or your husband) done any of the following things to help out YOUR own parents—either on a regular basis or, for example, when they were sick or needed financial or other assistance? Did you:

- Give (them) money or help pay their bills or pay for housing or a business?
- Give (them) food or other goods?
- Do household chores or provide personal care?...

If Type A or B (Money or Goods): What is the total value of (type help) that you (or your husband) have provided/given to your parents in the last 12 months?"; and "In the past 12 months have YOUR own parents ever done any of the following things to help you out (or your husband)—either on a regular basis or, for example, when you were sick, had a baby, or needed financial or other assistance? Did they:

- Give you money or help pay their bills or pay for housing or a business?
- Give you food or other goods?
- Take care of your children without pay?
- Do household chores or provide personal care?

If Type A or B (Money or Goods): What is the total value of (type help) that you (or your husband) have received from your parents in the last 12 months? "

Analogous questions were asked about time and money help received from/to the spouse's parents.

Model

The answers to the set of questions about transfers with parents translate into 14 transfer equations. To simplify the discussion, we discuss only the eight equations for transfers of

TABLE 4. MONEY AND TIME TRANSFERS FROM ALL ADULT NON-CORESIDENT CHILDREN

	Money		
	Any (MFC)	Log Amount (ln A_{mic})	Any Time (TFC)
Children's Characteristics			
Number of children in school	-0.1181** (0.0548)	0.1031 (0.0780)	-0.0919 (0.0759)
Number of children completed school	0.0772*** (0.0204)	-0.0137 (0.0232)	0.0186 (0.0229)
Number of high school graduate sons	0.1612*** (0.0349)	0.2265*** (0.0375)	-0.0010 (0.0378)
Number of high school graduate daughters	0.1852*** (0.0388)	0.1418*** (0.0401)	0.0204 (0.0396)
Number of college graduate sons	0.2696*** (0.0755)	0.5450*** (0.0880)	-0.0306 (0.0821)
Number of college graduate daughters	0.1601** (0.0703)	0.4296*** (0.0989)	-0.0469 (0.0839)
Parents' Characteristics			
Wife education	-0.0099 (0.0135)	0.0089 (0.0174)	0.0132 (0.0158)
Husband education	-0.0204 (0.0131)	-0.0005 (0.0162)	0.0133 (0.0156)
Wife's age	0.0090* (0.0049)	-0.0081 (0.0063)	0.0142** (0.0059)
Husband's age	-0.0027* (0.0015)	0.0007 (0.0018)	-0.0004 (0.0017)
Coreside with a son	0.1093 (0.0770)	0.0721 (0.0919)	-0.0748 (0.0863)
Coreside with a daughter	0.0250 (0.0803)	-0.0007 (0.0962)	-0.1140 (0.0907)
Number of children at home	-0.0180 (0.0185)	-0.0197 (0.0254)	0.0008 (0.0217)
Log wife's monthly earnings	-0.1243** (0.0485)	0.0346 (0.0723)	-0.0809 (0.0550)
Wife not working	0.1225* (0.0722)	0.2715*** (0.0945)	0.0615 (0.0826)
Log husband's earnings (current)	-0.0841* (0.0446)	0.1067* (0.0603)	-0.0484 (0.0511)
Chinese	0.3347*** (0.0808)	0.6058*** (0.0974)	-0.4127*** (0.0928)
Indian	-0.1704* (0.0934)	0.2846** (0.1158)	-0.0707 (0.1027)
Intercept	1.0255* (0.5779)	3.6765*** (0.7367)	-0.6629 (0.6627)
$\sigma_{u_{mic}}$		1.2911*** (0.0316)	

Note: Standard errors are in parentheses.

*** $p < .01$; ** $p < .05$; * $p < .10$

TABLE 5. EFFECTS OF NUMBER OF CHILDREN AND THEIR EDUCATION ON TRANSFERS

	Probability of a Transfer	Expected Amount (Probability × Amount)	Difference in Probability	Difference in Expected Amount
Number of Children^a				
One	0.443858*** (0.021040)	124.424149*** (11.716814)		
Three	0.505270*** (0.021963)	137.803745*** (12.365697)	0.061412*** (0.016230)	13.379596* (7.565234)
Five	0.566557*** (0.031871)	150.334300*** (17.248001)	0.122699*** (0.032177)	25.910152 (15.907897)
Education of Children^b				
Relative to Three Sons, no High School or College Graduates				
One high school graduate	0.569241*** (0.018232)	194.724762*** (15.745318)	0.063971*** (0.013901)	56.921018*** (8.208829)
Two high school graduates	0.631442*** (0.022978)	270.922866*** (25.710743)	0.126172*** (0.027006)	133.119121*** (21.788732)
Three high school graduates	0.690373*** (0.030963)	371.520827*** (45.018507)	0.185103*** (0.038383)	233.717082*** (43.240373)
One college graduate	0.611327*** (0.031927)	287.542201*** (34.175845)	0.106057*** (0.029118)	149.738456*** (29.116353)
One high school, one college graduate	0.671483*** (0.028990)	396.141451*** (45.246765)	0.166213*** (0.031758)	258.337706*** (41.543025)
Two high school, one college graduate	0.727492*** (0.030376)	538.307655*** (67.080290)	0.222222*** (0.037340)	400.503910*** (65.018749)
Three college graduates	0.794438*** (0.062937)	1111.395815*** (303.506391)	0.289169*** (0.066058)	973.592070*** (302.490234)

Note: Standard errors are in parentheses.

^aNo high school or college graduates are included.

^bEach family has three sons.

*** $p < .01$; ** $p < .05$; * $p < .10$

money to both sets of parents and time transfers (i.e., housework and childcare) from both sets of parents. These eight equations illustrate each type of relationships involved; the remaining six equations are analogous, with the directions of transfers reversed and with only housework time provided to parents. The equations are described as follows.

Any Money to wife's parents, and log amount if positive. A probit function indicates whether there was a positive transfer of money (A or B) to the parents of the wife,

$$MTP_w = \begin{cases} 1 & \text{if } \alpha'_{w1} X_w + \alpha_{w2} TFP_w + \zeta + v_w > 0 \\ 0 & \text{otherwise} \end{cases},$$

and if so the (log) amount of money (A and B) is given by,

$$\ln A_{mwp} = \beta'_{w1} X_w + \beta_{w2} TFP_w + \lambda + \mu_w.$$

Any housework time from the wife's parents. A probit function indicates whether there was a transfer,

$$HFP_w = \begin{cases} 1 & \text{if } \alpha'_{w1} X_w + \theta_h + \omega_{hw} > 0 \\ 0 & \text{otherwise} \end{cases}.$$

Any childcare time from the wife's parents. A probit function indicates whether there was a transfer,

$$CFP_w = \begin{cases} 1 & \text{if } \alpha'_{c1} X_w + \theta_c + \omega_{cw} > 0 \\ 0 & \text{otherwise} \end{cases}.$$

Any Money to husband's parents, and log amount if positive. A probit function indicates whether there was a positive transfer of money (A or B) to the parents of the husband,

$$MTP_H = \begin{cases} 1 & \text{if } \alpha'_{H1} X_H + \alpha_{H2} TFP_H + \zeta + v_H \\ 0 & \text{otherwise} \end{cases},$$

and if so the (log) amount of money (A and B) is given by,

$$\ln A_{mH} = \beta'_{H1} X_H + \beta_{H2} TFP_H + \lambda + \mu_H.$$

Any housework time from the husband's parents.

$$HFP_H = \begin{cases} 1 & \text{if } \alpha'_h X_h + \theta_h + \omega_{hh} > 0 \\ 0 & \text{otherwise} \end{cases}$$

Any childcare time from the husband's parents.

$$CFP_H = \begin{cases} 1 & \text{if } \alpha'_h X_h + \theta_c + \omega_{hh} > 0 \\ 0 & \text{otherwise} \end{cases}$$

All stochastic terms are assumed to be normally distributed. The heterogeneity terms $(\zeta, \lambda, \theta_h, \theta_c)$, and the analogous components in the other direction, may be freely correlated, but the remaining parent-specific residual components all are assumed to be independent of one other and across parents.

Money transfers are represented by two equations: (1) a probit index function equation for any (positive) money transfers from the couple to the wife's parents and (2) the (log) amount of transfer if there is any. The two equations illustrate potential self-selection into positive transfers. If the residual in the any transfer equation $(\zeta + v_w$ or $\zeta + v_h)$ is correlated with the residual in the "amount" equation $(\lambda + \mu_w$ or $\lambda + \mu_h)$, then ignoring self-selection will lead to biased estimates of the amount equation. Because there are two sets of parents with which a couple may transfer, we use a parametric within-couple estimator for the amount equation. That is, we explicitly model and account for a correlation between the couple's propensity to give and its amount of giving, represented by common components in the equations for the propensity to transfer money (ζ) and for the amount transferred (λ). The variance of each of these components is identified by having two sets of parents. Then the correlation between them measures the extent of couples self-selection into positive transfers. This parametric fixed-effect approach also allows us to maintain identification of the selection model, while including the same set of covariates in the equations for any transfer and for amount of transfers.

The above discussion also illustrates the third issue related to correlation: that correlation may be substantively interesting. In this example, we estimate a correlation in giving (any or amount) to her parents and to his parents, and a correlation in receiving time help from her parents and from his parents, in each case due to the common component in the two equations for the two sets of parents (reported separately by the two spouses). It is important to point out that our empirical procedures do not restrict the correlation to be positive.¹⁰ The equations above are written as they are to reflect the empirical results that they all are positive (except for childcare, which had no correlation).

The second correlation issue illustrated in these equations is the correlation between the residual of a couple's propensity to receive time transfers from his and her parents $(\theta + \omega_w$ or $\theta + \omega_h)$ and the couple's money transfer to the parents, thus inducing correlation of the time transfer variables $(TFP_w$ and $TFP_h)$ in the equation for money transfers from the couple

with the residual in those equations. In this case we also include a common component in the time transfer equation for the two sets of parents (θ), which also may enter with opposite signs if empirically indicated. The endogeneity of time transfers in the money transfer equations is accounted for by allowing a correlation of θ with $(\zeta$ and $\lambda)$.

The common components (ζ, λ, θ) are independent of the parent specific residuals, and each variance of the latter residuals for the probit equations $(\sigma_{vw}, \sigma_{wh}, \sigma_{vh}, \sigma_{wh})$ is normalized to 1.

There is an analogous set of relationships in the remaining six equations for transfers in the reverse direction, and a set of correlations between the two sets of three couple components. All of these residual correlations are empirically important in the couple transfer relationships.

Estimation

We estimated parameters by maximizing the marginal likelihood function over the full set of parameters. Conditional on the six common components, two pairs of (ζ, λ, θ) , the likelihoods of the various observed outcomes (transfers of various types and the amounts where appropriate) are independent, and the joint conditional likelihood is the product of the individual conditional likelihoods (each one being a probit probability or normal density function). The "full joint likelihood" of (1) the observed outcomes conditional on the family components and (2) the six conditioning family components is the product of their individual likelihoods. We then obtain the marginal likelihood used in estimation by integrating¹¹ this "full joint likelihood" over the range of the six conditioning variables to obtain the marginal likelihood of the observed outcomes.

Results

One of the potentially important issues noted earlier was the endogeneity of time transfers in their effect on monetary transfers in the opposite direction—that is, the effect of time transfers from parents (housework and/or childcare) on monetary transfers to the same parents, and the effect of time transfers to the parents (housework) on money transfers from the same parents. In addition there may be important self-selection into positive transfers, which would bias estimates of the parameters of the equations for amount of positive transfers. For these issues, having two sets of parents (the wife's and the husband's) provides the opportunity to obtain parametric fixed-effect estimates of the exchange parameter. In addition there are substantively interesting interpretations of correlations between other sets of transfer equations.

We first include a common (to the child couple) component in the equations for the two set of parents (identified by having two) for each type of transfers to and from parents. There are thus seven family components for the seven types of transfers, each one entering the equations for two sets of parents—the wife's parents and the husband's parents. We

10. The correlation will be negative if the components $(\zeta$ and $\lambda)$ enter the respective transfer equations with opposite signs. The correlation in the propensity to give, for example, can be $\pm \sigma_{\zeta}^2 / (1 + \sigma_{\zeta}^2)$.

11. We use a multivariate generalization of Gauss-Hermite integration developed by Lillard (1993).

TABLE 6. STANDARD DEVIATIONS AND CORRELATIONS OF FAMILY COMPONENTS IN TRANSFERS

	Money to Parents		Time from Parents ^a	Money from Parents		Time to Parents ^a
	Any (MTP)	Amount (ln A _{mp})	Any (TFP)	Any (MFP)	Amount (ln A _{mp})	Any (MTP)
Any Money to Parents	0.4994*** (0.0740)	0.3330 (0.3043)	0.3036 (0.3390)	0.3081** (0.1318)	-0.5438*** (0.1614)	0.9846*** (0.1292)
Amount of Money to Parents	0.3330 (0.3043)	0.3096*** (0.0775)	-0.4971 (0.4681)	-0.6372*** (0.1924)	0.5083** (0.2397)	0.7817*** (0.1727)
Any Time from Parents ^a	0.3036 (0.3390)	-0.4971 (0.4681)	0.3465*** (0.1423)	0.9707*** (0.2141)	0.2861 (0.2772)	0.9999*** (0.2157)
Any Money from Parents	0.3081** (0.1318)	-0.6372*** (0.1924)	0.9707*** (0.2141)	0.4852*** (0.0965)	0.0933 (0.3659)	-0.1400 (0.2586)
Amount of Money from Parents	-0.5438*** (0.1614)	0.5083** (0.2397)	0.2861 (0.2772)	0.0933 (0.3659)	0.6273*** (0.1654)	-0.0717 (0.3614)
Any Time to Parents ^a	0.9846*** (0.1292)	0.7817*** (0.1727)	0.9999*** (0.2157)	-0.1400 (0.2586)	-0.0717 (0.3614)	0.4625*** (0.0802)

Notes: Standard errors are in parentheses. All equations estimated jointly.

^aFor housework. Childcare had no common component.

*** $p < .01$; ** $p < .05$; * $p < .10$

estimate all of these outcome relationships (i.e., equations and distributions of family components) jointly by maximum likelihood using the approach outlined earlier. Each of these family components in transfers is quite significant, except for the transfer of childcare time from parents for which there was no heterogeneity.¹² Estimates of the standard deviation of the six remaining heterogeneity components are presented in the diagonal elements (the small boxes) in Table 6.

First, consider self-selection into positive transfers, represented by the correlation between the family component for any transfers (from/to) and the family component for the (log) amount of transfers (from/to). Neither of these correlations is significant. Although we estimate the reported parameters jointly, the sign and significance (and substantive importance) of estimates of the transfer amount equations are not different.

Second, consider the endogeneity of household time transfers in the money transfer equations. There are four relevant correlations: (1) household time from parents with any money to them; (2) household time from parents with amount of money to them; (3) household time to parents with any money from them; and (4) household time to parents with the amount of transfers from them. These correlations appear in the off-diagonal elements of the diagonal large boxes in Table 6. Of the six correlations, including the correlation between any and amount of money, there is no correlation significant even at $p < .10$. Time transfers may be taken as exogenous in the money transfer equations, although the estimates reported below account for these correlations and

were not substantively affected by their inclusion. We discuss the remaining correlations below.

Table 7 shows estimates of the effects of child and parent characteristics on transfers of money from a couple to both sets of parents. The child and spouse characteristics are both important. The husband's earnings significantly affect transfers in terms of the presence and amount of money to both sets of parents, whereas the wife's work status and earnings affect transfers to only her own parents. As a gross relationship (not reported), children's education strongly affects transfers to parents, but the relationship is diminished after controlling for children's earnings. Controlling for earnings of the child and spouse, total household income still positively influences transfers to both parents. Parents who provide reportedly unpaid childcare and housework are significantly more likely to be given transfers. Other parents' characteristics including age and health status also influence transfers.

Transfers of childcare and housework time from parents are significantly greater for couples with more young children, and less for couples with older children. These transfers are also reduced for couples that coreside with the other set of parents and/or for couples when the wife of the couple has never worked (see Table 8).

The likelihood of money transfers from parents to the couple, as shown in Table 9, is greater if the child provides housework help to the parents and is reduced as the couple's total household income increases, but is unrelated to the earnings of the husband or wife. As illustrated in Table 10, the likelihood of a transfer of housework help to parents is greater if a parent is in poor health, but is influenced by little else.

12. And thus childcare is not endogenous.

TABLE 7. MONEY TRANSFERS TO PARENTS

	Any Money		Log Amount	
	Wife	Husband	Wife	Husband
Child's Characteristics^a				
Education of child < 10 years ^a	0.0247** (0.0119)	0.0116 (0.0172)	0.0327** (0.0127)	0.0633*** (0.0155)
Education of child 10–12 Years	0.1017* (0.0523)	0.1814*** (0.0567)	0.0785 (0.0492)	0.1309*** (0.0483)
Education of child > 12 Years	0.1070 (0.0704)	–0.0311 (0.0563)	0.1895*** (0.0598)	0.0757* (0.0389)
Number of living siblings	–0.0161 (0.0124)	–0.0081 (0.0131)	–0.0195 (0.0130)	–0.0060 (0.0110)
No other household income reported	0.0218 (0.1642)	0.0423 (0.1805)	0.2468 (0.1536)	0.2187 (0.1503)
Log total other household income	0.0204 (0.0266)	0.0560* (0.0299)	0.0480** (0.0239)	0.0691*** (0.0239)
Wife never worked	–0.5518*** (0.1048)	–0.0032 (0.1248)	–0.2913*** (0.1124)	0.0278 (0.1033)
Wife not currently working	–0.3022*** (0.0773)	–0.0656 (0.0840)	–0.3071*** (0.0756)	–0.0368 (0.0696)
Log wife's monthly earnings	0.1356*** (0.0486)	0.0299 (0.0508)	0.3436*** (0.0468)	0.0431 (0.0430)
Husband's permanent earnings (age-adjusted)	0.2374*** (0.0818)	0.1756*** (0.0559)	0.2517*** (0.0837)	0.4711*** (0.0828)
Husband's current earnings (deviation from permanent earnings)	0.1689*** (0.0521)	0.1756*** (0.0559)	0.1488*** (0.0521)	0.2265*** (0.0484)
Parent's Characteristics^a				
Only mother is alive	0.6726** (0.2912)	0.6808** (0.3405)	–0.1946 (0.3006)	0.6960** (0.2900)
Father's age	0.0072* (0.0042)	0.0083* (0.0048)	–0.0018 (0.0044)	0.0098** (0.0042)
Mother's age	0.0055*** (0.0020)	0.0050** (0.0021)	0.0036* (0.0021)	0.0025 (0.0018)
Parents live with a sibling	–0.0257 (0.0966)	0.2757*** (0.1049)	0.0744 (0.0992)	–0.1280 (0.0843)
Parents of spouse coreside	–0.0235 (0.1053)	0.2718* (0.1652)	0.1247 (0.1051)	–0.2790** (0.1255)
Father's health poor	0.1395 (0.1656)	0.3565** (0.1796)	–0.0217 (0.1686)	0.1174 (0.1210)
Mother's health poor	0.0413 (0.1279)	0.0882 (0.1337)	–0.2293* (0.1305)	–0.1270 (0.1113)
Parent provided childcare	0.3100*** (0.0890)	0.4517*** (0.1189)	0.3222*** (0.0811)	0.2187** (0.0872)
Parent provided housework	0.2832*** (0.1072)	0.2538 (0.1585)	–0.0071 (0.0941)	–0.1602 (0.1080)
Chinese	0.1341 (0.0928)	–0.3295*** (0.1043)	0.0610 (0.0955)	0.3941*** (0.0938)

(continued on the next page)

(Table 7 continued from the previous page)

	Any Money		Log Amount	
	Wife	Husband	Wife	Husband
Indian	-0.6667*** (0.0980)	-0.7013*** (0.1157)	-0.0394 (0.1114)	0.3252*** (0.0972)
Intercept	-3.6242*** (0.6503)	-3.3762*** (0.7216)	-0.4467 (0.5814)	0.0892 (0.5747)
$\sigma_{u_{mp}}$	1.0094*** (0.0316)	0.9731*** (0.0310)		

Notes: Standard errors in parentheses. All equations are estimated jointly.

*Wife or husband as appropriate for the equation.

*** $p < .01$; ** $p < .05$; * $p < .10$

DISCUSSION

Results from our analysis of *inter vivos* transfers of money and time in Malaysia sheds light on a number of the theoretical hypotheses we summarized earlier. In this section, we organize the discussion by considering how these results bear on the each of major hypotheses we discussed.

Old Age Security Hypothesis

The pattern of life cycle transfers depicted in Figure 1 is broadly consistent with the old age security hypothesis in the sense that it shows that the dominant direction of monetary transfers within families is from the younger to the older generation. According to this hypothesis, children provide income for their elderly parents because, on the one hand, asset accumulation through saving is difficult and risky and, on the other hand, the availability of pensions and state-provided social security tends to be extremely limited or nonexistent. The results from our analysis of the determinants of transfer behavior are at least weakly consistent with this hypothesis, with the strongest evidence showing that old age support is provided by sons for mothers who are aged, widowed, or in poor health.

Looking at transfers of money and time to couples from all their non-coresident children in Table 4, we find evidence that is weakly supportive of the old age security motive. First, there is little evidence that the age of the couple has any effect on the amount of money received or whether money is provided by children; children are more likely to provide time help, however, as the wife becomes older. We find that couples with less income are more likely to receive transfers if the wife does not work or if her earnings or her husband's earnings are low; but these effects are generally not highly significant. Only the wife's work status is a significant determinant of the (log) amount received. The positive effect of husband's earnings is of the "wrong sign," but only of borderline significance. In part, these weak results may be due to the fact that only married couples are considered in the data reported in Table 4.

Results on transfers from the perspective of married children are more informative. First, consider the effect of parental characteristics on monetary transfers to the husband's and wife's parents, which are reported in Table 7. The evidence is quite strong that an elderly mother is more likely to receive monetary support from both her sons and her daughters as they age, especially after her husband has died. In addition, having a father who is in poor health makes it more likely that a son will make a transfer; but there is no significant effect of his mother's health or of the health of either of the wife's parents. Except for the husband's father's age, however, none of these parental characteristics have a significant effect on amount of the monetary transfer to either set of parents.

The analysis of time transfers provided by the household to the husband's and wife's parents, shown in Table 10, yields some additional evidence that both sons and daughters provide old age security for their mothers: When either spouse's mother is in poor health she is given more help, and the husband's mother also receives more help as she ages. There is no effect of either spouse's mother being a widow, however. As was also largely true of monetary transfers, time transfers are not influenced by father's characteristics.

There is also some evidence of a trade-off between monetary transfers and coresidence: If the husband's parents live with one of his siblings, the couple is more likely to make a transfer to them, although the size of the transfer is not affected. Moreover, if his wife's parents coreside with him, he tends to transfer a lower amount to his parents, although the likelihood of the transfer curiously is increased.

Parental Repayment Hypothesis

According to the parental repayment hypothesis, human capital investment in children is financed through an implicit family capital market in which parents provide support for their children's education with a combination of grants and loans, and children repay them by providing old age support for their parents. Our results provide strong support for this hypothesis.

TABLE 8. TIME TRANSFERS FROM PARENTS

Malaysia	Any Childcare		Any Housework	
	Wife	Husband	Wife	Husband
Child's Characteristics^a				
Education of child	0.0227* (0.0118)	0.0145 (0.0160)	0.0111 (0.0149)	-0.0192 (0.0203)
Education of child's spouse	-0.0142 (0.0122)	-0.0318** (0.0138)	0.0021 (0.0155)	0.0066 (0.0164)
Number of living siblings	-0.0299** (0.0127)	-0.0289* (0.0149)	-0.0159 (0.0165)	-0.0066 (0.0197)
Log total household income	-0.0042 (0.0368)	0.0073 (0.0386)	0.0373 (0.0525)	-0.0024 (0.0579)
Wife never worked	-0.3377*** (0.1092)	-0.4075*** (0.1419)	-0.1366 (0.1295)	-0.0061 (0.1634)
Wife not currently working	-0.1223 (0.0757)	-0.1192 (0.0891)	-0.0224 (0.0963)	-0.1017 (0.1195)
Log wife's monthly earnings	-0.0482 (0.0436)	0.0035 (0.0531)	-0.0108 (0.0524)	-0.0031 (0.0772)
Husband's permanent earnings (age-adjusted)	0.1493 (0.0963)	-0.0862 (0.1097)	0.0362 (0.1304)	0.0301 (0.1544)
Husband's current earnings (deviation from earnings)	0.0071 (0.0595)	-0.0712 (0.0659)	-0.0082 (0.0829)	0.0159 (0.0901)
Parent's Characteristics^a				
Only mother is alive	-1.0397*** (0.2985)	-0.9207** (0.3835)	-1.3355*** (0.4243)	-1.1069** (0.5269)
Father's age	-0.0115*** (0.0043)	-0.0161*** (0.0057)	-0.0170*** (0.0063)	-0.0177*** (0.0077)
Mother's age	0.0084*** (0.0027)	0.0083** (0.0032)	0.0141*** (0.0050)	0.0088* (0.0049)
Parents live with a sibling	0.0752 (0.1031)	-0.3237*** (0.1104)	0.1319 (0.1357)	-0.0724 (0.1638)
Parents of spouse coreside	-0.3665*** (0.1184)	-0.1227 (0.1841)	-0.0598 (0.1361)	0.1091 (0.2227)
Father's health poor	0.0165 (0.1586)	0.0306 (0.1892)	0.0847 (0.1944)	-0.4528 (0.3081)
Mother's health poor	0.1280 (0.1340)	-0.2717* (0.1604)	0.2175 (0.1507)	-0.0957 (0.2016)
Number of children age 0–5 (at home)	0.2423*** (0.0352)	0.1950*** (0.0413)	0.2129*** (0.0404)	0.0235 (0.0526)
Number of children age 6–12 (at home)	-0.0206 (0.0313)	0.0669* (0.0347)	-0.0719* (0.0411)	0.1202*** (0.0415)
Number of children age 13–18 (at home)	-0.0355 (0.0467)	-0.1055** (0.0535)	-0.0461 (0.0537)	-0.1416* (0.0756)
Number of children age > 18 (at home)	-0.2613*** (0.0837)	-0.3870*** (0.1454)	-0.2289*** (0.0883)	-0.3289 (0.2250)
Chinese	-0.2181 (0.5988)	0.3936 (0.7159)	-1.3355*** (0.4243)	-1.1069** (0.5269)

(continued on the next page)

(Table 8 continued from the previous page)

Malaysia	Any Childcare		Any Housework	
	Wife	Husband	Wife	Husband
Indian	-0.4145*** (0.1030)	0.2214* (0.1178)	-0.0170*** (0.0063)	-0.0177** (0.0077)
Intercept	0.0039 (0.0963)	0.2509** (0.1154)	0.0141*** (0.0050)	0.0088* (0.0049)

Notes: Standard errors in parentheses. All equations jointly estimated.

^aWife or husband as appropriate for the equation.

*** $p < .01$; ** $p < .05$; * $p < .10$

We first consider results from the parents perspective presented in Tables 3 and 4. Total parental transfers of money to all non-coresident children, reported in Table 3, are strongly related to the number of these children who currently are attending high school or college both in terms of the probability of giving a transfer and, for children in college, in terms of the amount of the transfer. The gender composition of children in school does not have a strong effect on transfers, but it appears that sons in college receive somewhat higher amounts.

Parental resources play a significant role in these transfers to children. The amount of transfer, but not the probability of transfer, is related positively to father's earnings. The results also show that mothers help to finance the education of their children through labor market activities. The probability of transfer is higher when the wife works, and the amount transferred is related positively to the wife's earnings. Finally, it is important to note that the education of both the mother and the father have highly significant effects on the probability of making transfers to children, and that the father's education also affects the amount of transfer. Lillard and Willis (1994) find that parental education has an important impact on children's educational attainment in Malaysia. Our results suggest that one way in which parental education has an effect on their children's education is to increase their willingness to finance that education.

In a rich country where parents are well-off relative to their children, the Becker-Tomes (1976) theory implies that altruistic parents invest in their children's human capital until the marginal rate of return falls to the level of rates of return on alternative investments; at that point, if additional transfers are desired, they are made in the form of *inter vivos* gifts of money or bequests. In a rapidly growing country like Malaysia, in contrast, lifetime incomes of the older generation are generally lower than of the younger generation, and the demand for educated labor tends to grow rapidly (Lillard and Willis 1994). Under these circumstances, parents have an incentive to shift some of their retirement savings toward investment in their children's human capital, provided they can expect to be repaid when they reach old age.

The evidence on total monetary transfers a couple receives from all non-coresident children, presented in Table 4, is strongly supportive of the repayment hypothesis. The probability of receiving a transfer is related positively and significantly to the couple's number of children who are not currently in school. In addition, as the educational attainment of these children increases, the probability of transfer receipt is enhanced significantly. For example, the effect of having an additional son on the probit index for receiving a transfer is 0.08 if the son has only an elementary school education, 0.23 ($= 0.0772 + 0.1612$) if he has a high school degree, and 0.34 ($= 0.0772 + 0.2696$) if he has had some college education. The effects of having an additional daughter are equally positive if she has an elementary or high school education, but there is no marginal increase if she has gone to college. When a transfer takes place, additional children also have a positive effect on the amount of the total transfers received that increases in magnitude the higher the child's educational attainment. Specifically, an additional son has no effect on the (log) amount of a transfer if he has an elementary school education, but an additional high-school educated son raises the total transfer by about 22%, and an additional college educated son raises it by about 53%. An additional daughter has similar effects, but of somewhat smaller magnitude. Finally, our interpretation of these transfers as a repayment of an implicit loan contract is consistent with the small effect of husband's income on either the probability or the amount of repayment because the circumstances of a lender do not influence the repayment obligation.

We may examine additional evidence on the repayment hypothesis from the perspective of transfers given by a married couple to the husband's or wife's parents using the estimates presented in Table 7. First, we may verify that the positive effect of an adult child's education on transfers to his or her parents holds even after controlling for income at both the household and individual level. Specifically, in the table we see that additional education of either spouse has a generally positive effect on the probability that the household makes transfers to either the husband's or the wife's parents; but most of the coefficients are either insignificant or of marginal significance. For both spouses, the (log) amount of the

TABLE 9. MONEY TRANSFERS FROM PARENTS

	Any Money		Amount of Money	
	Wife	Husband	Wife	Husband
Child's Characteristics^a				
Education of child	0.0218* (0.0130)	-0.0226 (0.0173)	0.0174 (0.0213)	0.0801** (0.0344)
Education of child's spouse	-0.0167 (0.0148)	0.0226 (0.0149)	0.0336 (0.0229)	-0.0159 (0.0314)
Number living siblings	-0.0043 (0.0143)	-0.0038 (0.0156)	-0.0454* (0.0241)	0.0267 (0.0355)
Log total household income	-0.0863** (0.0405)	-0.0909** (0.0458)	0.1419** (0.0666)	0.0428 (0.0757)
Wife never worked	-0.0155 (0.1233)	-0.0878 (0.1446)	0.3161 (0.2047)	-0.1423 (0.3144)
Wife not currently working	0.0321 (0.0895)	-0.0799 (0.1018)	0.0782 (0.1422)	0.0816 (0.2419)
Log wife's monthly earnings	-0.0334 (0.0526)	0.0419 (0.0693)	0.0035 (0.0891)	-0.0151 (0.1285)
Husband's permanent earnings (age-adjusted)	0.1084 (0.1082)	0.0585 (0.1218)	-0.0609 (0.1707)	0.1614 (0.2891)
Husband's current earnings (deviation from permanent)	-0.0687 (0.0645)	-0.1282* (0.0778)	-0.0758 (0.1117)	-0.2018 (0.1724)
Only mother is alive	-1.7822*** (0.3744)	-1.3320*** (0.4180)	-0.3124 (0.5827)	0.0311 (0.8082)
Provided housework to parent	0.5509*** (0.0915)	0.4095*** (0.1042)	0.1399 (0.1332)	-0.1281 (0.2217)
Parent's Characteristics^a				
Father's age	-0.0256*** (0.0055)	-0.0201*** (0.0062)	-0.0014 (0.0086)	0.0094 (0.0125)
Mother's age	0.0018 (0.0029)	-0.0044 (0.0029)	-0.0027 (0.0053)	-0.0054 (0.0061)
Parents live with a sibling	0.0104 (0.1158)	-0.3064** (0.1225)	-0.1027 (0.2053)	0.1110 (0.2905)
Parents of spouse coreside	-0.0845 (0.1265)	-0.0663 (0.1947)	-0.2520 (0.2002)	0.0629 (0.5307)
Father's health poor	0.0174 (0.2034)	-0.4018* (0.2342)	-0.1570 (0.3295)	-0.2301 (0.5593)
Mother's health poor	-0.2656 (0.1644)	-0.1117 (0.1896)	-0.0009 (0.3606)	0.2393 (0.3849)
Chinese	-0.0764 (0.1212)	-0.0609 (0.1349)	0.7242*** (0.2316)	1.2137*** (0.2664)
Indian	0.4645*** (0.1090)	0.1616 (0.1332)	1.0878*** (0.1622)	1.0452*** (0.2844)
Intercept	1.7453** (0.6924)	1.9845** (0.8462)	3.1243*** (0.9943)	4.0422** (1.6228)
$\sigma_{u_{mp}}$	0.9330*** (0.1171)	1.2170*** (0.0964)		

Notes: Standard errors in parentheses. All equations estimated jointly.

^aWife or husband as appropriate for the equation.

*** $p < .01$; ** $p < .05$; * $p < .10$

TABLE 10. TIME TRANSFERS TO PARENTS

	Any Housework	
	Wife	Husband
Child's Characteristics^a		
Education of child	0.0107 (0.0117)	-0.0138 (0.0153)
Education of child's spouse	0.0237* (0.0135)	0.0151 (0.0129)
Number of living siblings	0.0019 (0.0131)	0.0049 (0.0129)
Log total household income	0.0604 (0.0417)	0.0019 (0.0390)
Wife never worked	-0.0489 (0.1098)	-0.0117 (0.1208)
Wife not currently working	-0.0251 (0.0816)	-0.0867 (0.0892)
Log wife's monthly earnings	-0.0515 (0.0494)	-0.0553 (0.0535)
Husband's permanent earnings (age-adjusted)	-0.0798 (0.0993)	0.0772 (0.1048)
Husband's current transitory earnings (deviation from permanent earnings)	-0.1202* (0.0621)	0.0061 (0.0612)
Parent's Characteristics^a		
Only mother is alive	-0.1222 (0.3056)	-0.0749 (0.3286)
Father's age	0.0005 (0.0044)	0.0023 (0.0046)
Mother's age	0.0040 (0.0024)	0.0053** (0.0024)
Parents live with a sibling	-0.1534 (0.1084)	0.1776* (0.1046)
Parents of spouse coreside	-0.0028 (0.1187)	0.2477 (0.1639)
Father's health poor	-0.1173 (0.1752)	0.3045* (0.1589)
Mother's health poor	0.5270*** (0.1347)	0.4258*** (0.1318)
Intercept	-0.0419 (0.6244)	-0.9775 (0.6415)
Chinese	-0.6936*** (0.1121)	-0.7465*** (0.1246)
Indian	-0.3689*** (0.1045)	-0.0042 (0.1111)

Notes: Standard errors in parentheses.

^aNon-coresident children.

*** $p < .01$; ** $p < .05$; * $p < .01$

transfer increases with the level of education, although in somewhat irregular fashion. For example, transfers to the husband's parents increase by 6%, 13%, and 7%, respectively, for husbands with an elementary, high school, or college education compared with husbands with no schooling. The pattern for transfers to the wife's parents is a bit more regular, rising from 3% to 8% to 19% as her education increases.

It is of interest to examine the implications for the parental repayment hypothesis of effects of other variables in the equations reported in Table 7. Recall from Table 4 that the number of children has a significant effect on total transfers received by parents. If children's transfers were primarily motivated by altruistic concern for their parents' welfare, we might expect that the amount that a given child transfers would depend negatively on the amount that the parent receives from other children. Under the hypothesis of an implicit loan contract, however, transfers would not depend on the number of siblings. In Table 7 we see that the probability of making a transfer and the amount of the transfer are independent of the number of siblings of either spouse.

In a world of uncertain returns to education, it would be advantageous to the borrower to have an "income-contingent" educational loan in which payments would be higher or lower depending on the borrower's resources. In Table 7, we see that the amount, but not the probability of transfers, to either the husband's or wife's parents vary by total household income. In addition, we see that the husband's permanent and transitory earnings each have highly significant effects on both the probability and the amount of transfers to his own and to his wife's parents. If the latter result is interpreted within the educational loan framework, it suggests that a daughter's parents may obtain some repayment for their investments in her education through her success in the marriage market. The analysis also shows that both the probability and the amount of transfers to the wife's parents are related positively and significantly to the wife's current and lifetime labor market activity and to her current earnings, but that these variables have no effect on transfers to the husband's family. It is possible to interpret this finding as support for the notion that women's earnings provide them with more bargaining power within the household,¹³ but an obvious alternative is that women use some of their earnings to repay implicit loans from their parents.

Altruism Hypothesis

As we discussed previously, one of the leading hypotheses to explain transfers within families is that transfers are simply gifts given because of altruistic feelings by one family member for another. Even though we have emphasized the

13. Using data from Taiwan, Lee, et al. (1994) obtain a similar finding that wife's earnings tends to raise transfers to her family, but not to her husband's family. They interpret it as evidence that as a wife's earnings increase her bargaining power within the household increases. Also see Strauss and Thomas (1995) for a survey of literature that attempts to infer bargaining power within the family from the relationship between the distribution of resource ownership between spouses and observable family allocation decisions.

quid pro quo aspect of transfers that finance children's education and provide for the old age support of parents, nothing in our discussion rules out the possibility that net transfers are made within the family. In particular, we have no way of determining with certainty whether the monetary transfers received by elderly parents from their non-co-resident children have a higher present value than expenditures made earlier on non-co-resident children (as depicted in Figure 1) or the still earlier expenditures made on co-resident children, which we are unable to measure. In view of the data in Table 1, which show that current transfers constitute a relatively small percentage of the total income of the older generation, we believe that it is quite unlikely that Malaysian parents are making a "profit" on their children. Put differently, we suspect that there is a considerable "grant" component in parental investments in children.

Although we have no direct evidence on the degree to which the transfers we observe are driven by altruistic motives, we can look at some indirect evidence. As we already have noted, our findings that parents' resources are related only weakly to the amount of transfers they receive and that a given child's contributions are independent of the number of siblings he or she has are somewhat contrary to the predictions of altruistic models, in which transfers tend to equalize net incomes across generations.

We also have noted, however, that children's transfers to parents tend to be income-contingent and that the amount received by the elderly parents (especially the mother) is contingent on marital status, age, and health. These are features of pooling relationships that would be mutually beneficial among risk-averse individuals and would be generated if these individuals were altruistic toward one another. Unfortunately we do not have enough information to determine whether these various contingencies generate "actuarially fair" transfers, as we would expect under a nonaltruistic mutual insurance agreement, or whether some parties systematically gain, as we might expect with an altruistic motivation. While altruism is not a necessary component of risk sharing agreements, it is no doubt helpful in promoting compliance with pooling agreements by family members who otherwise would have an incentive to run out on their obligations.

Exchange Motive for Transfers

One of the frequently cited motives for intergenerational transfers is the exchange of money for time (Cox 1987). The MFLS provides unusually rich data to test for exchange-related monetary transfers because time transfers can be entered directly into the money transfer equation. Table 7 shows the estimated effects, conditional on all other covariates in the equations. There is clearly strong evidence of exchange-related transfer behavior. In each case involving reportedly unpaid childcare from the parent, the child/couple is more likely to pay monetary transfers and pays a larger amount than when the parent provides no childcare. Similarly, housework from the parent is more likely to generate a payment from the child; whereas the magnitudes of effect are approximately the same, the husband's transfer ef-

fect is estimated less precisely and is thus insignificant while the wife's transfer effect is significant. There is no effect on the amount of money given to the parent in this case. From the other direction, even though the likelihood of a transfer of money from the parent to the child is low, it is significantly higher if the child/couple provides housework for the parent; but the amount of the transfer is unaffected. There is, therefore, strong evidence in favor of the exchange hypothesis.

Heterogeneity of Transfer Behavior

Our discussion of the motivation for transfers has assumed implicitly that all households have similar motivations for engaging in transfers; so our empirical task is simply to sort out which of the theoretical possibilities appear to be operative and which are absent. As discussed earlier, the richness of the MFLS-2 data permits us to estimate jointly all 14 of the equations describing transfers of time and money between a couple household and the husband's and wife's parents. The estimated correlations among the variance components of these equations permit us to address questions concerning the homogeneity of transfer behavior directly.

These correlations, reported in Table 6, provide extremely strong evidence of heterogeneity of transfer behavior across different families. This is shown by the fact that the correlations along the diagonal in Table 6 are all positive and highly significant. Recall from the earlier discussion that these correlations are based on separate reports by the husband about transfers to his parents and by the wife about transfers to her parents. The positive correlations along the diagonal imply that whenever transfers of any given type are higher on one side of the couple's family they also tend to be higher on the other side. Thus some families tend to engage in a lot of transfer activity and others in very little activity for reasons that are not captured by the measured variables in our model.

The correlations across different types of transfer, which are given in the large off-diagonal boxes in Table 6, are also of interest. In all cases, there are strongly positive and significant correlations between components determining the existence of a transfer relationship. So, for example, components determining "any money from parents" is positively correlated with "any money to parents" and with "any time from parents." Once again, these results suggest a great deal of heterogeneity in the strength of transfer networks, with some families showing well-established transfer relationships along all dimensions and other families showing few connections in any dimension.

There are two significant negative correlations in the large off-diagonal boxes: one between "any money from parents" and "amount of money to parents" and the other between "any money to parents" and "amount of money from parents." This suggests that, within a transfer relationship, unmeasured variation in the resources or needs of either the children or their parents influence the amount of the transfer. For example, if a parent is in ill health in a way not measured in the survey, the son will tend to increase the amount

of money he gives to his parents, and it is less likely that his parents will give money to him. The fact that the correlation between the amounts of money given by children and parents is strongly positive suggests that heterogeneity in the scale of transfer activities overwhelms tendencies of amounts to be negatively correlated because of unmeasured variation in needs or resources.

Exactly what common factor or factors are responsible for these positive correlations remains an open question. It could be that families vary in the degree of altruism, in the degree of mutual trust, or in physical proximity. We can conclude, however, that transfer behavior in Malaysia is far from homogenous.

CONCLUSION

In this paper we use an unusually rich body of data on intrafamily transfers of money and time in Malaysia to address a variety of hypotheses concerning the determinants of intergenerational transfers. We find broad evidence for the provision of old age security through the family in Malaysia, particularly for widows who are elderly and in ill health. We find especially strong evidence in favor of the parental repayment hypothesis. Parental transfers to children serve primarily to finance their education, and grown children's transfers to elderly parents are a strongly increasing function of the child's education. Repayment to parents from daughters comes partly through her husband's income, but also specifically from her own work and earnings. We also find evidence that transfers from children to parents are contingent on the incomes in the child's household, which together with evidence of contingency on the health, age, and marital status of the parent suggests significant risk spreading across generations. We find clear evidence of exchange of money for help with both housework provided by children to their parents and childcare and housework provided by the parents for their children. Finally, we find considerable evidence of heterogeneity in the strength of transfer relationships across families.

The dominant direction of monetary transfers between non-coresident parents and children in Malaysia is from the younger to the older generation. This result is in sharp contrast to the pattern of transfers from parents to children that is found in the United States (McGarry and Schoeni 1995), where employer provided pensions, health insurance, and public social security and Medicare have replaced the family. Family finance of investment in the younger generation's human capital has played a significant role in facilitating rapid economic growth in Malaysia, and monetary transfers from their children have enabled both the younger and the older generation to share in the benefits of growth.

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