NBER WORKING PAPER SERIES

THE PROVISION OF TIME TO THE ELDERLY BY THEIR CHILDREN

Axel Boersch-Supan

Jagadeesh Gokhale

Laurence J. Kotlikoff

John Morris

Working Paper No. 3363

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 1990

We are very grateful to the National Institute of Aging for research support. We thank Dan Nash and Manjula Singh for research assistance. This paper is part of NBER's research program in Aging. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

NBER Working Paper #3363
May 1990

THE PROVISION OF TIME TO THE ELDERLY BY THEIR CHILDREN

ABSTRACT

This paper uses matched data on the elderly and their children to study the provision of time by children to the elderly. It develops a Tobit model as well as a structural model to analyze the determinants of this decision. The main determinants of the amount of time given to parents appear to be the parent's age, reported health, and institutionalization status, and the children's age, health, and sex. Older parents, less healthy parents, and non-institutionalized parents receive more time from their children, while younger children, healthier children, and female children provide more time. In contrast to these demographic determinants, economic variables, such as children's wage rate and income levels, appear to play a rather insignificant role in the provision of time. In addition, the evidence does not support the hypothesis that parents purchase time from their children.

Axel Boersch-Supan
University of Mannheim
Postfach 10 34 62
Gebaude A5,6
6800 Mannheim 1
Germany

Jagadeesh Gokhale
Boston University
270 Bay State Road
Department of Economics
Boston, MA 02215

Laurence J. Kotlikoff
Boston University
270 Bay State Road
Department of Economics
Boston, MA 02215

John Morris
Hebrew Rehabilitation Center for the Aged
1200 Centre Street
Boston, MA 02131

Has support of the aged by families declined in the post war period? While the jury is still out, there is substantial evidence pointing in that direction. Over 60 percent of the elderly (those over 60) now live alone compared with only 25 percent in the 1940s. For the old old (those over 85) the fraction living alone has increased from 13 percent to 57 percent. At the same time there has been more than a tripling of the rate of institutionalization; today almost a quarter of the old old live in institutions compared with only 7 percent in the 1940s (Sandefur and Tuma, 1987). In addition to not living with the elderly, the children of the elderly rarely provide financial transfers to the elderly (Kotlikoff and Morris, 1989) and when they do, the amounts are typically quite meager.

One defense of the children's behavior is demographic; the current number of children per elderly totals about half the number observed in the 1940s. Since the elderly of today had fewer children than did their parents and have, in some cases, succeeded in outliving their children, the current situation may be much of their own making. A second defense is that the relative income position of the elderly has improved permitting them to live alone (Michael, Fuchs, and Scott, 1980) and obviating the need for financial transfers from their children. A variety of studies (e.g., Boskin, Kotlikoff, and Knetter, 1985 and Andrews and Hurd, 1990) have demonstrated that current poverty rates of the elderly are close to, if not below, those of the nonelderly. Much of the improvement in the relative incomes of the elderly is due to increases in real social security benefits legislated in the 1970s. A third point to consider in assessing child support of the elderly involves payment for nursing home care. A good fraction of the elderly in nursing homes are private pay patients. Some of these payments are being made directly by

children. While we are not aware of time series data on nursing home payments by children, it seems plausible that such payments per child measured at constant dollars have increased over time.

While the elderly may need and appear to be receiving less financial help from their children, their needs for companionship and physical assistance may well have increased in the postwar period; the increased longevity of the elderly often means living for years in poor states of health. In addition, those elderly who continue to live will lose a large fraction of their old friends and even some of their children along the way. Most studies of the increasingly separate living arrangements of the elderly conclude that these arrangements reflect the preferences and improved financial means of the elderly. In contrast, Kotlikoff and Morris (1988) suggest that about half of the elderly would prefer to live with their children, but continue to live apart because of their children's preferences coupled with their children's financial abilities to live apart from their parents.

One reason the jury remains out on family support of the aged involves the issue of time spent by children with their elderly parents. As Morgan's (1984) research suggests, children's provision of time to their elderly parents is an important, if not the most important, form of economic transfer to the elderly by their children. This paper studies the provision of time by children to their elderly parents. We use the 1986 Hebrew Rehabilitation Center (HRCA) for the Aged follow-up survey of Massachusetts elderly and the 1986 NBER-HRCA survey of the children of these Massachusetts elderly. While the child survey involved an interview of only one of the children of the elderly (the one designated by the elderly), each child was asked a set of detailed questions not only about his own circumstances, but also about the circumstances of each of his siblings. The combined data are unique in their

detail of demographic and economic characteristics of the elderly and each of their children.

We use these data to answer a number of questions about the provision of time by children to their parents. These questions include: How does the health status of the elderly influence the amount of time given by children? How does the health status of the children influence their provision of time to their parents? Do parents with more income and wealth receive more time from their children? How does the employment status and wage rates of children affect their provision of time? Do children free ride on their siblings provision of time? Are home care corporations used by children as a substitute for their own time? Do the institutionalized elderly receive more or less time? Are daughters, other things equal, more or less likely to provide time?

We take two empirical approaches in studying the data. First, we estimated Tobits for the provision of time by children. Second, we estimate a structural model of the joint decision of children to work and to provide time to their elderly parent. Since the opportunity cost of providing time to the parent for working children is the wage, the structural model indicates how wage rates influence the allocation of time by children to the elderly. The model can account for corner solutions in the data; this is important because some children do not work, some do not provide time to their parents, and some neither work nor provide time.

Our model assumes that the child is altruistic in that he (she) cares about the utility the parent receives from their time spent together. The model does not, however, consider the utility the child might derive from the consumption of the parent. Including the utility of parent's consumption in the child's utility function would require an analysis of financial transfers

from children to parents. But given that only 2.6 percent of children in our sample report making financial transfers to their elderly parent(s), the extra complications of modeling financial transfers seems to outweigh the potential benefits.[1] While we ignore financial transfers, the model does consider the simultaneous decisions by siblings as to how much time each sibling should provide the parent. The model assumes that each sibling takes time provided to the parent as given; i.e., the siblings play non-cooperative Nash.

Another issue not considered by the model is the possibility that children are not altruistic, but, in effect, sell their time (a la Bernheim, Shleiffer, and Summers, 1985) to their parents. The *quid pro quo* for this sale of time is a financial payment by parents to their children. But such transfers are also quite rare in our sample. In our sample only .9 percent of children report receiving financial transfers from their parents. In addition, as described below, children receiving financial transfers from their parents are no more likely to provide time to their parents than those not receiving transfers. While the possibility remains that parents pay for time transfers by leaving larger future bequests, it is not clear how one would estimate the magnitude of such contingent payments.

Section I presents our simple structural model. Section II describes the data and our sample selection. Section III presents Tobit estimates of the allocation of time by children to their parents. Section IV presents maximum likelihood estimates of the structural model. Section V summarizes the paper's findings and provides suggestions for future research.

I. A Simple Structural Model of the Joint Labor Supply and Time Provision Decisions

A. The Model

Our model assumes that the child's utility is logarithmic and depends on his consumption, leisure, and the total amount of time the parent receives from himself (herself) and his (her) siblings. The utility function of sibling i, U_i, is given by

$$(1) \qquad U_i = \alpha \log C_i + \beta \log \ell_i + \log(d_i + \sum_{j \neq i}^{N_i} d_j + 1)$$

In (1) α, β, and m are constants. The terms C_i, ℓ_i, d_i, and d_j ($j \neq i$) stand, respectivly, for consumption of child i, leisure of child i, time provided to the parent by child i, and time provided to the parent by sibling j. There are N_i siblings of child i. The unitary displacement value in the logarithm or time received by parent ensures the possibility that child i will provide zero time to his (her) parent even in the case that all his (her) siblings also provide zero time.

The child maximizes this function subject to constraints (2), (3), and (4):

$$(2) \qquad C_i \leq W_i(1-\ell_i-d_i) + Y_i$$

$$(3) \qquad d_i \geq 0$$

$$(4) \qquad d_i + \ell_i \leq 1$$

Equation (2) says that consumption cannot exceed labor earnings plus exogenous income, Y_i. Equation (2) says that time provided to the parent cannot be negative, and equation (3) says that the sum of leisure time plus time spent

with the parent cannot exceed the endowment of time which is normalized to unity.

Since (2) will always be binding, solutions for the values of ℓ_i and d_i satisfy:

$$(6) \qquad \left[\frac{\beta}{\ell_i} - \frac{\alpha W_i}{W_i(1-\ell_i-d_i) + Y_i}\right](1-d_i-\ell_i) = 0$$

$$(7) \qquad \left[\frac{1}{d_i + \sum_{j\neq i}^{N_i} d_j + m} - \frac{\beta}{\ell_i}\right] d_i = 0$$

Letting $[\ ]_a$ and $[\ ]_b$ stand, respectively, for the values in the square bracket in (6) and (7), we have the following four cases: 1) $d_i+\ell_i=1$ and $d_i=0$ (the child is retired and provides no time) holds if $[\ ]_a > 0$ and $[\ ]_b < 0$; 2) $d_i+\ell_i=1$ and $d_i>0$ (the child is retired and provides time) holds if $[\ ]_a > 0$ and $[\ ]_b=0$; 3) $d_i+\ell_i<1$ and $d_i=0$ (the child works and provides no time) holds if $[\ ]_a = 0$ and $[\ ]_b < 0$; and 4) $d_i+\ell_i<1$ and $d_i>0$ (the child works and provides time) holds if $[\ ]_a=0$ and $[\ ]_b=0$.

B. Estimation

The condition that $[\ ]_a \geq 0$ implies: $\log(W_i(1-\ell_i-d_i)+Y_i) - \log(W_i\ell_i) \geq \log\alpha_i - \log\beta_i$, and the condition $[\ ] \leq 0$ implies: $\log\ell_i - \log(d_i+\Sigma_{j\neq i}d_j+m) \leq \log\beta_i$. In these expressions each child has individual-specific preference parameters, i.e., α and β are subscripted by i. We let $\log\alpha_i = x_i'\theta + \mu_i$ and $\log\beta_i = x_i'\psi + \upsilon_i$, where x_i' is a vector of characteristics of child i and his parent(s), θ and ψ are coefficient vectors, and μ_i and υ_i are mean zero independent normal errors with bivariate density $f(\mu_i,\upsilon_i)$. Define $H_i = \log(W_i(1-\ell_i-d_i)+Y_i) -$

$\log(W_i \ell_i) - x_i'\theta + x_i'\psi$ and $Z_i = \log \ell_i - \log(d_i + \Sigma_{j \neq i} d_j + m) - x_i'\psi$, then $H_i \geq \mu_i - \upsilon_i$ and $Z_i \leq \upsilon_i$. The probability of observing child i working and providing time can now be expressed as:

$$(8) \qquad \text{Prob}(H_i = \mu_i - \upsilon_i \text{ and } Z_i = \upsilon_i) = f(H_i + Z_i, Z_i)$$

where H_i and Z_i are evaluated at the observed values of ℓ_i and d_i.

The probability of observing child i retired and providing time is:

$$(9) \qquad \text{Prob}(H_i > \mu_i - \upsilon_i \text{ and } Z_i = \upsilon_i) = \int_{-\infty}^{H_i + Z_i} f(\mu_i, Z_i)\, d\mu_i$$

where H_i and Z_i are evaluated at the observed value of d_i and ℓ_i is evaluated at 1 minus the observed value of d_i.

The probability of observing child i retired and providing no time is:

$$(10) \qquad \text{Prob}(H_i > \mu_i - \upsilon_i \text{ and } Z_i < \upsilon_i) = \int_{Z_i}^{\infty} \int_{-\infty}^{H_i + \upsilon_i} f(\mu_i, \upsilon_i)\, d\upsilon_i d\mu_i$$

where H_i and Z_i are evaluated $d_i = 0$ and $\ell_i = 1$.

The probability of observing child i working and providing no time is:

$$(11) \qquad \text{Prob}(H_i = \mu_i - \upsilon_i \text{ and } Z_i < \upsilon_i) = \int_{Z_i}^{\infty} f(H_i + \upsilon_i, \upsilon_i)\, d\upsilon_i$$

where H_i and Z_i are evaluated at $d_i = 0$ and ℓ_i equals 1 minus the observed amount of time child i spends working.

Denote L_k as the probability of the observed labor supply and time provision of child k, then the likelihood, L, of the sample with N

observations is:

$$(12) \qquad L = \prod_{k=1}^{N} L_k$$

II. The Data, Sample Section Criteria, and Data Characteristics

A. The 1986 HRCA Elderly Survey and the 1986 NBER-HRCA Child Survey

The 1986 HRCA Survey of the Elderly is part of an ongoing panel survey of Massachusetts elderly which began in 1982. In addition to the 1982 and 1986 surveys, the elderly sample was reinterviewed in 1984, 1985, 1987, and 1989. The 1986 NBER-HRCA Child Survey is a survey of the children of those elderly interviewed in the 1986 HRCA Survey of the Elderly. One child of each elderly respondent was interviewed and asked a set of questions concerning his (her) household, his (her) parents, and his (her) siblings.

The original 1982 stratified sample of 3856 elderly individuals was drawn from two populations. The first population, accounting for 2674 of the elderly in the total sample, was drawn from communities in Massachusetts. In forming the community sample the state of Massachusetts was divided into 27 home care areas. Within each home care area communities were stratified, based on population, into large, medium, and small, and communities within each of the three groups were selected at random. Next HRCA used Massachusetts police records, which record the ages and addresses of all Massachusetts residents, to stratify the elderly by age, separating those age 75 and above from those below age 75. Elderly individuals within each subgroup were then randomly selected. The community and age stratifications produced an intentional over-representation of the old old as well as the elderly living in rural communities.

The second population, which accounts for the remaining 1182 elderly in the 1982 survey, was drawn from elderly participants of all 27 Massachusetts home health care corporations. In this sample the elderly were again stratified by age and the older old were oversampled. The sample's selection procedures are described in more detail in Morris et. al. (1987). The 1982 sample of the elderly included only the non-institutionalized elderly, but each subsequent survey has followed the initial sample as they changed residences, including moving into and out of nursing homes.

Each of the HRCA Surveys of the Elderly include detailed questions about living arrangements and health status. The 1986 reinterview of the elderly also contains a series of questions of the elderly about their children. These questions include the names, sexes, frequency of contact and the type of contact with children, the extent of financial aid given to and received from children, and the amount of assistance given by children to their elderly parents in performing activities of daily living. In addition, the 1986 survey contains a set of questions about the elderly respondent's income and wealth.

At the close of the HRCA elderly survey the elderly respondent was asked for permission to contact one of his/her children and ask that child to participate in our child survey. While a random selection of the child respondents would have been preferable, it was felt that the elderly respondents would be more cooperative if they were allowed to make the selection. Because of funding limitations we were able to sample designated only children of the community sample of elderly; i.e., we were not able to contact children of the home care sample of elderly. As mentioned, the community sample of elderly is a stratified random sample of non-institutionalized elderly.

Like the HRCA Surveys of the Elderly, The NBER-HRCA Child Survey is a telephone interview. The Child Survey is roughly 45 minutes in length. Interviews with the child's spouse were conducted if the child was unavailable. The questions in the Child Survey concerning the respondent's and spouse's characteristics include age, marital status, number of young children, work and health status, occupation, industry, education, grades in high school, income, and wealth. These questions are also asked of the respondent about his or her siblings. In addition, the child was asked to indicate (1) the frequency of contact between each sibling and each sibling's spouse and the HRCA elderly respondent parent, (2) the amount of financial assistance each sibling and his spouse give to or receive from the HRCA elderly respondent parent, and (3) the amount of time each sibling and his spouse spends with the HRCA elderly respondent per month. The child is also asked about his parents' and in-laws' health status as well as his parents' income and net wealth.

The sample size of the initial 1982 Survey of the Elderly is 3856. In contrast, the 1986 completed sample size of elderly was 2889, with 22.5 percent of the attrition since 1982 due to deaths. In the 1986 data over 90 percent of the elderly are above age 70, over 40 percent are the old old (above age 85), and over two thirds are females. The size of the NBER-HRCA Child Survey is 850. Including siblings the number of children of the HRCA Elderly Survey respondents for whom we have data is 1650.

B. Sample Section

The basic sample used in our statistical analysis contains 1650 children of 706 elderly respondents. We excluded observations in the case that data is missing on a child's age, sex, occupation, health, education, marital status, grades received in school, and employment status. We also excluded children with missing information on time provided their parent, children less than 18 years of age, children whose co-residence status with the parent respondent was not reported, and children for whom we are missing data on their parent's age.

C. Data Characteristics

Of the 706 elderly parents in our sample, 24 percent are age 55 to 70, 48 percent are age 71 to 80, and 28 percent are above 81 and above. The 1650 children (including siblings of the Child Survey respondents) of these parents range in age from 18 to 84; 20 percent are under 40, 29 percent are 41 to 50, 33 percent are 51 to 60, and 18 percent are 61 and over. Most of the elderly parents (70 percent) are females, and most (72 percent) are not married. In contrast, only 54 percent of children are female, and 76 percent of children are married. On average there are 2.42 children per elderly parent. A total of 21 percent of the elderly parents have 1 child, 32 percent have 2 children, 23 percent have 3 children, and 24 percent have 4 or more.

Among elderly who report their total household income, mean income is $11,247, and median income is $6,250. These and all subsequent dollar figures are in 1987 dollars. The corresponding figures for child households are $34,392 and $32,500. Among elderly who report total household net worth, mean net worth is $93,396 and median net worth is $40,000. The corresponding child net worth figures are $175,019 and $125,000.

Many of the elderly in our sample are in poor health; indeed 13 percent of the sample's elderly are in nursing homes or similar institutions, and 15 percent are enrolled in home care programs. In total 40 percent of the elderly self-report their health as fair or poor (as opposed to excellent or good). In terms of ADL (activities of daily living) status, the fraction reporting difficulty or inability in preparing their own meals is 44 percent; it is 56 percent for the case of taking out garbage, 33 percent for the case of performing house chores, 22 percent for the case of dressing one's self, 24 percent for the case of taking a bath or shower, 10 percent for the case of getting out of a chair without assistance, 21 percent for the case of problems maintaining bladder control, and 28 percent for the case of walking up and down stairs without assistance.

Not all the children of the elderly are in excellent or good health. A total of 13 percent of the children report their health (or have their health reported) to be either fair or poor. In the case of the 1255 spouses of these children, 14 percent report (have reported) their health to be fair or poor.

In addition to time demands imposed by the elderly parent respondent, the children in our survey may need to respond to the time demands by their other parent and their parent in-laws. The fraction of children with two parents is 30 percent. In the case of in-laws information was obtained only for the child respondents; i.e., the survey did not ask the child respondents about their siblings' in-laws. For child respondents the percent with one or two parent in-laws is 43 percent, and 33 percent of these in-laws are reported to be in fair or poor health.

A total of 64 percent of the 1729 children in the sample report (or have reported) that they are employed full-time, and 12 percent report (or have reported) that they are employed part time. The average annual wages of full-

time employed children for those children for whom we have information on wages is $32,914. Unfortunately, the child survey questionnaire did not separately ask about the wages plus salary of the child respondent and the wage plus salary of the child respondent's spouse, but rather asked about combined household wage and salary income. And in the case of the questions about siblings, the survey only asks about the total income of the sibling and the sibling's spouse; it does not separately ask about siblings' wages and salaries.

In the Tobit and maximum likelihood estimation we use an imputed full-time wage based on a regression of wages of child respondents or their spouses who report they are working full-time and for whom we can determine their wages plus salaries. As an example, in the case the respondent child is married, reports that he (she) works full-time, and also reports that his (her) spouse does not work, we know that the wages plus salaries of the couple are those of the child respondent. In this wage regression we use education dummies for years of education, grades in school, occupation, sex, health dummies, and a third order polynomial in age as explanatory variables.[2]

III. Model Estimation.

A. Tobit Estimates:

The Tobit model can be viewed as a test of a simpler version of the structural model presented above. It corresponds to the case that the amount of work the child does (which may be zero) is exogenously given, and the child simply divides his (her) non-work time between leisure and time spent with his (her) parent. In this simpler model consumption is exogeneously determined by the sum of exogenous non-labor plus labor income, so the child maximizes $U_i = \beta\log(\lambda_i - d_i) + \log(d_i + \Sigma_{j \neq i} d_j + m)$ subject to $d_i \geq 0$, where λ_i stands for 1 minus

the exogenously determined supply of labor. For this model equation (7) is modified to:

$$(7') \qquad \left[\frac{1}{d_i + \sum_{j \neq i}^{N_i} d_j + m} - \frac{\beta}{\lambda_i - d_i} \right] d_i = 0$$

The provision of time is positive if the square bracket in (7') equals zero, and it is zero if the square bracket is negative; i.e., $d_i=0$ if $0>[-\beta(\Sigma j \neq i dj+m)+\lambda]/(1-\beta)$ holds, otherwise $d_i=[-\beta(\Sigma_{j \neq i} d_j+m)+\lambda]/(1-\beta)$. Let the right hand side of this last equality equal $x_i'\gamma + \epsilon_i$, where x_i is a vector of characteristics of child i and his (her) parent and includes the amount of time provided to his (her) parent by his (her) siblings ($\Sigma_{j \neq i} d_j$), and ϵ_i is a standard normal error. Then d_i equals zero if the indicator function $I_i = x_i'\gamma + \epsilon_i$ is negative and equals I_i if the indicator is positive. But this is the standard Tobit model. Using data on all child respondents and their siblings and taking, for each observation, the time provided by all the other siblings as one of the x's in the Tobit regression appears to be appropriate provided the error terms, the ϵ_i's are uncorrelated across siblings.

Our actual Tobit model is a slight modification of the standard Tobit specification to take account of the 29 percent of children in our sample whose parents live with them. In these cases it is obvious that the child spends time with the parent, but we are not sure how to assess the amount of time. To accommodate these data we treat these observations as observations for which time provided by the child is positive, but the exact amount of time is unknown. The standard Tobit has two pieces of the likelihood function corresponding to the probability of no time provided and the probability of a specific amount of time provided. We add to the standard likelihood function

a statement for the probability of providing positive time, which is simply 1 minus the probability of providing zero time.

The time question in the Child Survey that provides the dependent variable for our analysis is: "In the last month, how many hours did you (and your spouse) spend with your parents, visiting, going out together, and/or helping him/her/them?" Of the 1179 children in the Tobit sample who are not living with the elderly respondent parent, 29 percent report (or have reported) spending zero time per month with their elderly parent. Another 31 percent report spending 1-10 hours per month; 18 percent report spending 11-20 hours per month, 9 percent report 21-30 hours per month, 5 percent report 31-40 hours per month, and 8 percent report spending 41 or more hours per month.

Excluding children living with their parents, the average number of hours provided per month is 15, and the median number is 8. Within this subsample of non-co-resident children, average and median hours provided by only children are 24 and 16; average and median hours (per child) provided by children with one sibling are 16 and 9; and average and median hours (per child) provided by children with two or more siblings are 12 and 5.

Tables 1 through 4 report results from four Tobit regressions. The first regression includes a set of 33 regressors (excluding the intercept). It does not, however, include the sum of time provided by siblings as a regressor. In considering the results it is important to keep in mind first, that time spent with the parent, d, is a censored variable, and second, that the change in expected time spent in response to a unit change in one of the regressor variables is the change in the unconditional expectation $E[d_i]$; i.e., the reported coefficients correspond to the product of Tobit coefficients times the probability that time spent is positive.

The first set of regressors in Table 1 (mr2-mr4) are dummies for the child's marital status. The dummy for married child (mr1) was excluded. As would be expected, separated/divorced, widowed, and never-married children provide more time to parents. Of these separated/divorced children provide very little additional time as compared to married children. Widowed children provide the most time to parents. The coefficients on all three dummies are, however, insignificant.

The dummy for married parents (pm1) was ommitted from the regression. The coefficients on parent's marital status indicate that as compared to married parents, divorced/separated parents (pm2) receive less time, but the standard error here is very large. In contrast, widowed parents' (pm3) receive substantially more time; and the coefficient is quite significant.

The next set of dummies (em2 and em3) are coded 1 when the child employment status is part-time (960 hours per year), and not-working. The dummy for children who have full-time (1920 hours per year) employment status (em1) was excluded. As can be expected, children who are working part-time provide marginally more time as compared to children working full-time. However, contrary to expectations, those who are not working provide substantially less time to parents as compared to children who are employed full-time. The former coefficient is insignificant while the latter is very close to significant. The dummy for child's spouse being employed either full-time or part-time (sempl) is positive. The coefficient, however, is insignificant.

The next variable (ns) indicates the number of siblings. A larger number of siblings may be expected to reduce the amount of time provided by each child since parent dependence on any one child would be lower. Moreover, if siblings free-ride on each other's time provision to the parent, a larger

number of siblings would provide additional scope for such free-riding behavior. The regression shows that, after controlling for other influences, the presence of additional siblings reduces the provision of time to parents by about 1 hour per month for each additional sibling. The coefficient on this variable is significant at the 10 percent level, but not the 5 percent level.

The dummy for the child's sex (sx) was set to equal 1 for male children. The coefficient suggests that male children who spend time, spend about 7 hours less per month than female children who spend time. The parent's sex dummy (psx), which also has a value of one for males, has a negative coefficient of -0.62 hours, but is not significant.

As expected, the dummy for child's self-reported health being 'poor' (hl4) shows a large negative effect on time spent with parent, and the coefficient is significant. 'Poor' health of spouse (sph4) may be expected to curtail the amount of time spent by the child with the parent. However, the opposite result is obtained from the regression. The coefficient on sph4 is positive, but insignificant. The variable (ph4) is a dummy for parent's self-reported health status being 'poor'. As expected, the time provided by children is higher for parents whose health status is 'poor', but the coefficient is not significant.

The variable padl is a sum of 14 dummies, each having a value of one if the parent is unable to preform specific tasks, and a value of zero otherwise.[3] A larger value of padl thus represents a higher degree of parent disability. The coefficient on this variable is positive and significant. Its value is close to one, indicating that for every additional count of disability the child spends an additional hour per month with the parent.

The coefficient on the dummy indicating whether the parent is in a nursing home or similar institution (plv), is large, negative, and quite significant. The result suggests that such parents receive substantially less time from their children. A large, negative, and significant impact on child's time also arises in the case the parent receives services from a home care corporation (phc). Parents receiving 'Meals on Wheels' are represented as 1 in the next dummy variable (pwh). The coefficient is negative, but not significant. These results suggest that children substitute for their own time by using institutions, home care corporations, etc. to care fro their eldelry parents.

Older children spend less time with parents, but the coefficient on child's age (ag) is not significant. Older parents receive substantially more time, and the coefficient on parent's age (pag) is significant.

The next two dummies (milh4 and filh4) have a value of one if mother-in-law's or father-in-law's health, as reported by the child is 'poor', for children who have either of these parents-in-law. Surprisingly, the coefficient on the former is highly positive and quite significant.[2] The coefficient on father-in-law's health is negative and insignificant.

Do children substitute financial transfers for time transfers to parents and do parents buy time from children? The variable (fhlpl) is a dummy that assumes a value of one if the child made positive financial transfers to the parent within the past year. According to the coefficient on fhlpl, children who make such transfers spend about 11 hours more per month with parents than children who do not. The coefficient on this variable is significant. The dummy indicating whether the parent made a financial transfer to the child (phlpl) has a large negative coefficient, and this too is significant. Both parts of the question posed above are thus answered in the negative.

Higher total income of the parent (pyv) when parent income is reported is associated with substantially less time devoted by the child to the parent, but the coefficient is not significant. Higher total income of the child (kyv) is also associated with less time spent by the child with the parent, but again the coefficient is insignificant. The signs on both these coefficients are plausible: Parents with larger income can afford to buy supervisory and care services, and are, therefore, less dependent on their children, and children with higher incomes would be expected to have a higher opportunity cost of time.

If expectations of bequests are important determinants of parent-child relationships one would expect richer parents to receive more time from their children and richer children to provide less time to parents. The regression indicates that parents with higher net worth (pwlv) receive more time from children, and children with higher net worth (kwlv) spend less time with parents. The coefficients on both these variables are, however, insignificant.

Children with a higher wage rates (wage) spend somewhat less time with their parents. The coefficient on the wage rate is quite significant.

Table 2 repeats the Tobit of Table 1, but also includes the total amount of time provided by siblings (sibtm) as a regressor. The introduction of this extra regressor does not substantially alter the estimated coefficients and standard errors for the rest of the variables. More time provided by siblings (sibtm) is associated with a very small reduction in the amount of time provided by the child and the coefficient is insignificant.

Table 3 reports Tobit results for the subsample that excludes children who live with their parents. In this subsample the intercept is much larger. Coefficients on two out of the three dummies for child's marital status have

the opposite signs as compared to those in Table 1. Now children who are divorced/separated or never-married spend less time with parents as compared to married children, a result that seems implausible. The coefficients on all three child marital-status dummies are, however, insignificant. Unlike Table 1, Table 3 shows that children who are employed part-time (em2) spend less time with parents as compared to children employed full-time, though the coefficient is again not significant. Non-working children (em3) still spend less time with parents than those employed full-time, but the coefficient is now clearly significant.

The variable for number of siblings (ns) is significant and larger in absolute value in Table 3 as compared with Table 1. The coefficient on the dummy for parents receiving home-care services is now a much smaller negative number and is insignificant. Table 3 shows a much smaller though still positive coefficient on the index for parent disability (padl), and the coefficient is now insignificant. This indicates that in the subsample of non-co-resident parents and children, children seem to spend very little additional time with parents when the degree of parent disability is higher.

Table 4 repeats Table 3, but also includes the total amount of time provided by siblings (sibtm) as a regressor. Surprisingly the coefficient on time spent by siblings enters with a positive sign though it is still not significant. The coefficient on the number of siblings variable (ns) in Table 4 is negative and significant. This seems to suggest that in the subsample under consideration siblings divide the total time spent with the parent amongst themselves. However, for any given family size, increased time spent by one child seems to induce additional time transfers from siblings. This interpretation must however be viewed with caution given that the coefficient on time spent by siblings is not significant.

B. Estimates for the Structural Model:

Tables 5 and 6 present maximum likelihood regression results for the structural model presented in Section I. The data used for this estimation is a subsample of 415 respondent children who do not live with their parent, and for whom valid data on labor and non-labor income are available.[4] Table 5 presents estimated values for the coefficient vectors θ and ψ contained in the regression equations used to model the parameters of the utility function (1), viz, $\log\alpha_i = x_i'\theta + \mu_i$ (equation 1 in the table) and $\log\beta_i = x_i'\psi + \upsilon_i$ (equation 2 in the table). For this analysis, total disposable time available for an individual per year was taken to be 4380 hours (assuming 12 hours of disposable time per day). The estimation procedure assumes that μ_i and υ_i (i=1,N) are independently and identically distributed. The vector of child and parent characteristics, x, contains a subset of the variables used as regressors in the Tobit model.

The structural estimates are somewhat disappointing. With the exception of the intercepts and the coefficient on the number of siblings (ns) in column 1, all of the coefficients of the structural estimates that are significant. Using the estimated values $\hat{\theta}$ and $\hat{\psi}$ and a given configuration of the vector x we can obtain the individual-specific preference parameters α and β. The optimal choices of the time transfer to parent (d) and the amount of leisure (ℓ) can then be inferred by setting the terms within the square brackets of (6) and (7) to equal zero and simultaneously solving the two resultant equations. If the optimal choice of d turns out to be negative, a corner solution is imposed by setting d to zero and recomputing the optimum amount of leisure.

The first row of Table 6 presents the choices of d and ℓ for a hypothetical individual assuming mean values of the characteristic vector x computed over the 415 observations used in the estimation.[5] Subsequent rows of Table 6 present the the choices of d and ℓ that result from changing the value of one of the elements in vector x (as indicated) while maintaining the others at their mean values. The columns labeled Δd and $\Delta \ell$ indicate the change in d and ℓ from their respective values in the first row of the table. The results in Table 6 indicate that out of a total of 4380 hours per year a hypothetical individual with mean characteristics spends 50 hours per year with the parent, consumes 3368 hours of leisure per year, and works for the remaining 962 hours.

Divorced/separated children (mr2) and widowed children (mr3) spend more time with their parents than do married children (the dummy for which (mr1) was excluded). A corner solution on time spent with the parent is obtained when the value of the dummy for never-married children (mr4) is set at unity. All non-married children consume less leisure than married children. These results confirm those of Table 4 (which is also based on a sample of non-co-resident parents and children): Widowed children spend the most, and never-married children the least, amounts of time with their parents.

A corner solution is also obtained when the parent's marital status is separated/divorced (pm2) rather than married (the dummy for which (pm1) was excluded). Compared with children whose parents are married, children with a widowed parent (pm3) spend more time with the parent and also consume slightly less leisure.

Children whose spouses work full-time or part-time (sempl) spend more time with parents and consume a slightly lower amount of leisure. This is also consistent with the results of Table 4.

The larger the number of siblings (ns), the greater the amount of time spent by the child with parent and the lower the amount of leisure consumed. This effect is surprisingly large. The Tobit specification showed that a larger number of siblings reduces the time spent by the child with the parent. Unlike the Tobit model, however, the leisure decision is endogenous in the structural model. A possible explanation of this result is that with fixed time spent by siblings, a larger number of siblings implies smaller lengths of visits to parent by each sibling. To compensate the child reduces his consumption of leisure and increases the time spent with parent.

Changing the value of the child's sex dummy (sx) to 1 results in a sharp decline in the amount of time spent with the parent and the amount of leisure consumed decreases by 384 hours per year. A similar, though much smaller, reduction is obtained in both time spent and consumption of leisure when the parent's sex dummy is set to unity.

Corner solutions are obtained for both the endogenous variables when child's health (hl4) or child's spouse's health (sph4) dummies are alternatively set to unity. A substantially larger amount of time transfer is induced when the parent has 'poor' health (ph4). Children with parents residing in a nursing home or similar institution (plv) spend less time with the parent and consume substantially more leisure. There is a substantial decline in time spent by children when the parent receives home care services (phc), although the increase in the child's consumption of leisure is slight. These results are consistent with those of Table 4. Contrary to the results of Table 4, the child seems to spend much more time when the parent is receiving 'Meals-on-Wheels' (pwh).

Surprisingly, and in contradiction to earlier results, Table 6 shows that the time spent by children declines, and the amount of leisure consumed

increases, with increasing degree of disability (padl) of the parent. Another surprising and puzzling result is that children with a mother or father-in-law with poor health make large time transfers to the parent.

The results obtained by perturbing values of child and parent ages, child's non-labor income, child's wage rate, parent's income, and child and parent wealth variables are all consistent with those of Table 4. The negative effect of time spent by siblings on the time spent by the child is not consistent with the result in Table 4. However, it is the "built in" prediction of the structural specification which assumes that siblings play non-cooperative Nash.

IV. Conclusion

The data reveal some clear patterns of time transfers from children to their elderly parents. Children appear to use institutions and home care as a substitute for their own provision of time. Parents who reside in nursing homes or are enrolled in home care programs receive, ceteris paribus, less than half the amount of time received by those in the community. The provision of time is strongly correlated with the age of the elderly parent; other things equal, the old old receive over twice the time of the young old.

The sex, age, and health status of children are additional important determinants of time provided to the elderly. Male children and younger children spend relatively little time with their parents. Children with poor health spend almost no time with their parents. If the spouse of the child is in poor health, the child also gives very little time, at least according to the structural model's results.

Other things equal, those elderly who self-report their health to be 'poor' appear to receive over twice the amount of time received by elderly

with better self-reports of health. Surprisingly, the degree of elderly disability does not appear to affect the amount of time provided to those elderly not living with their children, although it is a significant determinant in the larger sample that includes elderly living with their children.

The Tobit results for the entire sample of children, including those living with their elderly parents, indicate that more time is provided by single children and more time is received by single elderly, at least those who are widowed. In the structural model the effects of the child's and parent's marital status on time provided to the elderly are less clear, but there is strong evidence that widowed children spend substantially more time with their elderly parents.

The structural model predicts that more time provided by siblings will lead to substantially less time provided by the child in question. However, this prediction is, to a large extent, simply the implication of the form of the structural model we have adopted. In the less constrained Tobit estimation there is no evidence that siblings free-ride on each others' provision of time.

Both the Tobit and the structural estimates indicate a small effect associated with higher children's wage rates; children with higher wage rates provide somewhat less time to their elderly parents than other children. In contrast to the modest effect of higher wage rates, the effect of larger values of children's wealth is quite sizable. Wealthier children and children with higher incomes appear to provide less time than poorer children, but the standard errors around these effects are quite large.

The standard errors on the effects of parent's wealth and income are also sizable. One might summarize the findings here by saying that there is

certainly no strong evidence that richer parents receive more time than poorer parents; i.e., the paper provides little, if any, support for the Bernheim, Schleiffer, and Summers (1986) view that richer parents, in effect, purchase more time from their children.

To summarize, the results indicate that the main determinants of the amount of time given to parents are demographic. Economic variables, such as wage rate and income levels, appear to play a rather insignificant role in the provision of time.

Key to variables used in Tobit regressions.

mr2	= 1 if child is separated/divorced
mr3	= 1 if child is widowed
mr4	= 1 if child is never-married
pm2	= 1 if parent is widowed
pm3	= 1 if parent is divorced/separated
em2	= 1 if child is employed part-time
em3	= 1 if child is not-working
sempl	= 1 if child's spouse is employed full- or part-time
ns	= number of siblings
sx	= 1 if child is male
psx	= 1 if parent is male
hl4	= 1 if child rages his/her health as 'poor'
sph4	= 1 if child's spouse's health is 'poor'
ph4	= 1 if parent rates his/her health as 'poor'
padl	= index of disability (see text)
plv	= 1 if parent lives in nursing home or similar institution
phc	= 1 if parent receives home care services
pwh	= 1 if parent receives Meals-on-Wheels
ag	= child's age divided by 50
pag	= parent's age divided by 50
milh4	= 1 if mother-in-law's health is reported 'poor'
filh4	= 1 if father-in-law's health is reported 'poor'
fhlpl	= 1 if child made financial transfers to parent within the last year
phlpl	= 1 if parent made financial transfers to child within the last year
pym	= 1 if data on parent's total income is missing
pyv	= parents total income times one minus pym (in $100,000)
kym	= 1 if data on child's total income is missing
kyv	= child's total income times one minus kym (in $100,000)
pwlm	= 1 if data on net worth of parent is missing
pwlv	= parent's net worth times one minus pwlm (in $500,000)
kwlm	= 1 if data on net worth of child is missing
kwlv	= child's net worth times one minus kwlm (in $500,000)
wage	= child's wage rate (unit = $ 10.00 per hour)
sibtm	= total time provided by siblings of child
knly	= non-labor income of child
sig2	= estimated variance coefficient

Table 1: Result from Tobit regression of Time Spent by Child with Parent against Child and Parent characteristics.

Parameter	Coefficient	Std Error	t-Statistic
intercept	6.08	7.56	0.80
mr2	0.25	2.19	0.11
mr3	3.68	2.99	1.23
mr4	2.52	3.01	0.84
pm2	-2.22	3.39	-0.65
pm3	5.64	1.52	3.71
em2	0.15	2.12	0.07
em3	-4.06	2.08	-1.95
sempl	0.98	1.54	0.64
ns	-0.74	0.39	-1.88
sx	-5.47	1.33	-4.13
psx	-0.62	1.50	-0.41
hl4	-13.81	5.69	-2.43
sph4	1.62	3.16	0.51
ph4	4.38	2.71	1.62
padl	0.77	0.32	2.40
plv	-17.72	2.83	-6.27
phc	-7.45	1.74	-4.29
pwh	-2.38	2.46	-0.97
ag	11.41	3.46	3.30
pag	-0.83	8.75	-0.09
milh4	8.23	3.20	2.57
filh4	-13.81	5.70	-2.42
fhlpl	-2.27	4.83	-0.47
phlpl	15.66	6.09	2.57
pym	-2.79	1.70	-1.65
pyv	-29.73	17.44	-1.70
kym	-0.24	4.61	-0.05
kyv	-17.04	15.48	-1.10
pwlm	-1.16	1.74	-0.67
pwlv	1.72	1.89	0.91
kwlm	-1.68	3.64	-0.46
kwlv	-1.08	1.53	-0.71
wage	-0.55	0.14	-4.05
sig2	615.26	17.23	35.72

Log likelihood function = -4342.49
Number of observations = 1650

Table 2: Result from regression of Time Spent by Child with Parent against Child and Parent characteristics. Includes Time Spent by Siblings as a regressor.

Parameter	Coefficient	Std. Error	t-Statistic
intercept	6.21	7.57	0.82
mr2	0.29	2.19	0.13
mr3	3.62	3.01	1.20
mr4	2.52	3.02	0.83
pm2	-2.40	3.41	-0.70
pm3	5.57	1.53	3.65
em2	0.10	2.12	0.05
em3	-4.15	2.09	-1.99
sempl	1.02	1.54	0.67
ns	-0.63	0.41	-1.55
sx	-5.45	1.33	-4.11
psx	-0.67	1.51	-0.44
hl4	-13.86	5.67	-2.44
sph4	1.71	3.17	0.54
ph4	4.54	2.71	1.68
padl	0.78	0.32	2.40
plv	-17.98	2.87	-6.27
phc	-7.42	1.73	-4.28
pwh	-2.50	2.46	-1.01
milh4	11.38	3.47	3.28
filh4	-1.17	8.75	-0.13
fhlpl	8.19	3.21	2.55
phlpl	-13.67	5.73	-2.39
ag	-2.14	4.84	-0.44
pag	15.74	6.10	2.58
pym	-2.87	1.70	-1.69
pyv	-30.34	17.47	-1.74
kym	-0.40	4.63	-0.09
kyv	-17.86	15.52	-1.15
pwlm	-1.12	1.74	-0.64
pwlv	1.68	1.89	0.89
kwlm	-1.70	3.66	-0.47
kwlv	-1.04	1.53	-0.68
wage	-0.56	0.14	-4.09
sibtm	-0.01	0.01	-0.94
sig2	616.63	17.33	35.59

Log likelihood function = -4342.10
Number of observations = 1650

Table 3: Result from Tobit regression of Time Spent by Child with Parent against Child and Parent characteristics. Includes only Children not living with Parent.

Parameter	Coefficient	Std. Error	t-Statistic
intercept	13.13	7.50	1.75
mr2	-1.15	2.19	-0.52
mr3	2.82	2.98	0.95
mr4	-4.71	3.56	-1.32
pm2	-5.84	3.45	-1.69
pm3	2.31	1.52	1.52
em2	-0.76	2.15	-0.36
em3	-4.62	2.09	-2.21
sempl	1.50	1.53	0.98
ns	-1.79	0.41	-4.37
sx	-5.13	1.35	-3.81
psx	-0.93	1.51	-0.62
hl4	-15.40	7.10	-2.17
sph4	1.65	3.08	0.53
ph4	4.01	2.71	1.48
padl	0.06	0.32	0.18
plv	-5.98	2.90	-2.06
phc	-1.22	1.76	-0.69
pwh	-0.55	2.50	-0.22
milh4	10.77	3.34	3.22
filh4	-1.03	8.25	-0.13
fhlpl	9.91	3.15	3.14
phlpl	-18.81	6.90	-2.73
ag	-1.21	4.89	-0.25
pag	9.34	6.10	1.53
pym	-1.99	1.75	-1.13
pyv	-9.12	17.75	-0.51
kym	-1.67	4.95	-0.34
kyv	-20.53	14.89	-1.38
pwlm	-0.90	1.77	-0.51
pwlv	1.61	1.95	0.83
kwlm	-1.92	3.84	-0.50
kwlv	-0.02	1.45	-0.01
wage	-0.52	0.14	-3.84
sig2	686.34	21.69	31.65

Log likelihood function = -4197.25
Number of observations = 1179

Table 4: Results from Tobit regression of Time Spent by Child against Child and Parent characteristics. Sample Includes only Children not living with Parent. Includes Time Spent by Siblings as a regressor.

Parameter	Coefficient	Std. Error	t-Statistic
intercept	13.19	7.51	1.76
mr2	-1.17	2.19	-0.53
mr3	2.91	2.99	0.97
mr4	-4.76	3.54	-1.34
pm2	-5.64	3.46	-1.63
pm3	2.37	1.53	1.55
em2	-0.69	2.15	-0.32
em3	-4.51	2.10	-2.15
sempl	1.45	1.53	0.95
ns	-1.92	0.43	-4.48
sx	-5.16	1.35	-3.83
psx	-0.85	1.52	-0.56
hl4	-15.26	7.13	-2.14
sph4	1.50	3.10	0.48
ph4	3.81	2.73	1.40
padl	0.03	0.33	0.08
plv	-5.56	2.99	-1.86
phc	-1.19	1.77	-0.67
pwh	-0.38	2.50	-0.15
milh4	10.81	3.34	3.24
filh4	-0.81	8.26	-0.10
fhlpl	10.00	3.15	3.18
phlpl	-19.14	6.95	-2.75
ag	-1.33	4.89	-0.27
pag	9.09	6.12	1.49
pym	-1.88	1.75	-1.07
pyv	-8.30	17.73	-0.47
kym	-1.40	4.95	-0.28
kyv	-19.62	14.86	-1.32
pwlm	-0.92	1.77	-0.52
pwlv	1.66	1.94	0.86
kwlm	-1.95	3.84	-0.51
kwlv	-0.05	1.45	-0.03
wage	-0.51	0.14	-3.77
sibtm	0.01	0.01	0.96
sig2	685.16	21.68	31.60

Log likelihood function = -4196.68
Number of observations = 1179

Table 5: Maximum Likelihood Estimation of the Structural Model.

	Equation 1 ($\hat{\theta}$)			Equation 2 ($\hat{\psi}$)		
Parameter	Coefficient	S.E	t-Statistic	Coefficient	S.E.	t-Statistic
intercept	5.50	2.61	2.11	5.45	2.73	1.99
mr2	-0.79	1.03	-0.77	0.21	1.06	0.20
mr3	-1.28	1.29	-0.99	-0.26	1.02	-0.26
mr4	0.42	1.39	0.30	0.98	1.30	0.75
pm2	1.25	1.76	0.71	1.42	1.84	0.77
pm3	-0.28	0.52	-0.54	0.02	0.55	0.03
sempl	-0.64	0.59	-1.09	-0.33	0.57	-0.58
ns	-0.34	0.17	-1.99	-0.26	0.17	-1.57
sx	0.23	0.46	0.51	0.89	0.48	1.84
psx	0.09	0.49	0.18	0.38	0.54	0.71
hl4	2.38	6.27	0.38	0.28	12.39	0.02
sph4	1.26	0.83	1.52	-1.12	1.16	-0.97
ph4	-0.41	0.96	-0.43	-0.10	0.95	-0.11
padl	0.03	0.11	0.26	0.03	0.12	0.24
plv	0.33	0.80	0.41	-0.35	1.07	-0.32
phc	0.32	0.64	0.50	0.29	0.67	0.43
pwh	-0.28	1.01	-0.28	0.12	0.93	0.13
milh4	0.06	0.65	0.09	-1.05	1.07	-0.98
filh4	-0.37	2.68	-0.14	-0.15	2.62	-0.06
fhlpl	-1.29	1.22	-1.06	-0.35	1.03	-0.34
ag	0.03	1.77	0.02	-1.65	1.87	-0.88
pag	-1.46	2.23	-0.65	-1.43	2.39	-0.60
pym	0.18	0.58	0.31	0.04	0.65	0.05
pyv	4.38	15.12	0.29	3.13	15.39	0.20
kwlm	0.91	3.27	0.28	0.92	3.87	0.24
kwlv	0.58	0.33	1.76	0.62	0.39	1.56
pwlm	0.22	0.64	0.34	0.07	0.73	0.10
pwlv	-0.28	0.60	-0.46	-0.27	0.76	-0.36

Log Likelihood function: -1600.03
Number of Observations: 415
Note:

a) The variables knly, sibtm, and wage are part of the structural specification and have therefore been omitted from x, the vector of characteristics.

b) Work-time is endogenous and therefore eml and em2 have been omitted from vector x.

c) This subsample has no observation with parent making a financial transfer to the child. Hence the variable phlpl was omitted from vector x.

d) Asymptotic Standard Errors (S.E.) and t-Statistics are tabulated.

Table 6: Choices of d and ℓ Implied by Estimated Parameters.

				d	Δd	ℓ	Δℓ
At mean values				50	0	3368	0
mr2	=	1		134	84	2303	-1065
mr3	=	1		295	245	2152	-1216
mr4	=	1		0	-50	2822	-546
pm2	=	1		0	-50	3242	-126
pm3	=	1		65	15	3245	-123
sempl	=	1		93	43	3225	-143
ns	=	1		17	-33	3432	64
ns	=	2		78	28	3318	-50
ns	=	3		159	109	3190	-178
ns	=	4		265	215	3045	-323
ns	=	5		402	352	2883	-485
ns	=	6		575	525	2699	-669
ns	=	7		789	739	2495	-873
sx	=	1		3	-47	2984	-384
psx	=	1		28	-22	3185	-183
hl4	=	1		0	-50	4380	1012
sph4	=	1		0	-50	4380	1012
ph4	=	1		115	65	3030	-338
padl	=	0		66	16	3357	-11
padl	=	3		49	-1	3369	1
padl	=	6		32	-18	3380	12
padl	=	9		17	-33	3390	22
padl	=	12		3	-47	3400	32
plv	=	1		24	-26	3875	507
phc	=	1		5	-45	3426	58
pwh	=	1		79	29	2947	-421
milh4	=	1		84	34	4143	775
filh4	=	1		117	67	3103	-265
fhlpl	=	1		313	263	2232	-1136
child's age	= mean age	+	10	66	16	3663	295
child's age	= mean age	-	10	30	-20	3028	-340
parent age	= mean age	+	10	115	65	3317	-51
parent age	= mean age	-	10	0	-50	3409	41
parent income	= mean income	+	2000	47	-3	3376	8
parent income	= mean income	-	2000	53	3	3361	-7
child's wealth	= mean wealth	+	10000	39	-11	3373	5
child's wealth	= mean wealth	-	10000	62	12	3363	-5
parent wealth	= mean wealth	+	10000	51	1	3368	0
parent wealth	= mean wealty	-	10000	49	-1	3369	1
wage	= mean wage	+	5	46	-4	3311	-57
wage	= mean wage	-	5	56	6	3464	96
sibtm	= sibtm	+	20	31	-19	3382	14
sibtm	= sibtm	-	20	69	19	3355	-13
knly	= knly	+	2000	54	4	3435	67
knly	= knly	-	2000	46	-4	3302	-66

Notes

1. The mean amount of transfers from children to parents, when positive, is $2159 per year.

2. It was confirmed that the high positive and significant coefficient on the mother-in-law health dummy was not due to outliers in the data.

3. There are 157 of observations in the wage regression. The R^2 from the wage regression is .61. The coefficients (standard errors) from this regression are Intercept = -28194.65 (71464.92), Age of child = 1017.71 (4700.80), Age^2 = -5.97 (104.17), Age^3 = 0.063, (0.751), Dummy for 1-8 years of education = -1599.56 (6424.95), Dummy for 9-12 years of education = -960.82 (2236.20), Dummy for reported health as 'excellent' = 2165.11 (11436.56), Dummy for reported health as 'good' = -1619.78 (11388.68), Dummy for reported health as 'fair' = 1174.45 (12058.25), Dummy for reported grade in school as 'A' = -4827.79 (12185.82), Dummy for reported grade 'B' = 4269.33 (11795.60), Dummy for reported grade 'C' = 1700.29 (11654.26), Dummy for reported grade 'D'= -7531.44 (11800.93), Dummy for occupation code 2 = 28664.68 (16807.28), Dummy for occupation code 3 = 1588959 (17069.44), Dummy for occupation code 4 = 17508.99 (17049.96), Dummy for occupation code 5 = 13341.80 (16908.94), Dummy for occupation code 6 14808.53 (17332.27), Dummy for occupation code 7 = 13973.28 (16926.66), Dummy for male = 19662.50 (2085.96).

4. The variable padl is the sum of 14 activity dummies. These dummies had a value of 1 if:
- parent does not go out of building of residence more than once a week.
- parent does not prepare own meals.
- parent thinks he/she does not get enough to eat.
- parent does not take out garbage him/herself.
- parent not healthy enough to do ordinary work around the house.
- parent has problems dressing by him/herself.
- parent unable to prepare bath and dry self.
- parent unable to get up out of ordinary chair without help.
- parent has bladder accidents.
- parent unable to climb up or down stairs without help.
- parent is confined to bed.
- parent inclined to wander and/or get lost.
- parent needs constant supervision.
- parent uses either walker, 4-pronged cane, crutches, or wheelchair at least some of the time to get around.

5. Observations were deleted if data on wage income was positive but the child reported employee status indicated he/she was not working, or if data on wage income was missing

6. The mean values of the vector of characteristics x for the subsample of 415 observations are:

mr2	0.089
mr3	0.036
mr4	0.046
pm2	0.048

pm3	0.624
sempl	0.634
ns	1.569
sx	0.402
psx	0.342
hl4	0.007
sph4	0.019
ph4	0.063
padl	2.769
plv	0.169
phc	0.178
pwh	0.048
milh4	0.031
filh4	0.014
fhlpl	0.041
child's age	50.424
parent age	75.328
parent income	9873.494
child's wealth	196710.843
parent income	85924.699
wage	20.283
sibtm	154.207
knly	8728.207

References

Andrews, Emily and Michael Hurd, "Employee Benefits and Retirement Income Adequacy: Data, Research and Policy Issues," mimeo March 1990.

Bernheim, Douglas, Andre Shleiffer, and Lawrence Summers, "Bequests as A Means of Payment," Journal of Political Economy, vol. 93, 1986.

Boskin, Michael J., Laurence J. Kotlikoff, and Michael Knetter, "Changes in the Age Distribution of Income in the United States, 1968-1984," NBER working paper no. 1766, October 1985.

Kobrin, F.E. 1976a. "The fall in household size and the rise of the primary individual in the United States." Demography 13: 127-138.

Kobrin, F.E. 1976b. "The primary individual and the family: changes in living arrangements in the United States since 1950." Journal of Marriage and the Family 8: 233-238.

Kotlikoff, Laurence J. and John Morris, "How Much Care do the Aged Receive from their Children? - A Bimodal Picture of Contact and Assistance," in The Economics of Aging, David Wise, ed., Chicago, Ill.: Chicago University Press, 1989.

Kotlikoff, Laurence J. and John Morris, "Why Don't the Elderly Live with their Children? A New Look," forthcoming in NBER Conference Volume on the Economics of the Aged, 1990.

Michael, R.T., V.R. Fuchs, and S.R. Scott. 1980. "Changes in the propensity to live alone, 1950-1976." Demography 17: 39-56.

Moon, M. "The role of the family in the economic well-being of the elderly." The Gerontologist 23(1): 45-50.

Moon, M. 1977. The Measurement of Economic Welfare: Its Application of the Aged Poor. Academic Press: New York.

Morgan, James N., "The Role of Time in the Measurement of Transfers and Well-Being," in Maryiln Moon, ed., Economic Transfers in the United States, NBER Volume no. 49, Chicago, Ill.: University of Chicago Press, 1984.

Morris, J.N. and S. Sherwood, "Informal Support Resources for Vulnerable Elderly Persons: Can They Be Counted On; Why Do They Work?" International Journal of Aging and Human Development 18(2), 1983-1984.

Morris, John M., Claire E. Gutkin, Clarence C. Sherwood, and Ellen Bernstein, "Interest in Long Term Care Insurance." Final Report in connection with HCFA Cooperative Agreement no. 18-C-98375/1, June 1987.

Sandefur, Gary D. and Nancy Brandon Tuma, "Social and Economic Trends Among the Aged in the United States, 1940-1985," February, 1987.

Soldo, Beth J., "The Role of Demograhic Composition in Accounting for Changes in the Distribution of Living Arrangements among the Elderly: 1960-1970."

Presented at the annual meeting of the Population Association of America, 1977.

Wolf, Douglas, "Kinship and the Living Arrangements of Older Americans." Final report to the National Institute of Child Health and Human Development, The Urban Institute, 1983.

Wolf, Douglas, 1984. "Kin Availability and the Living Arrangements of Older Women," Social Science Research 13(1), 1984.