# INTERGENERATIONAL TRANSFERS AND LIQUIDITY CONSTRAINTS*

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A growing body of evidence indicates that liquidity constraints could affect a substantial proportion of U. S. consumers, but little is known about why these constraints might exist. An important, but little-explored, issue is the relationship between inter vivos intergenerational transfers and liquidity constraints. These transfers can ease borrowing constraints. Empirical transfer patterns match those predicted from a model in which transfers are allocated to liquidity-constrained consumers. In particular, the distinction between current and permanent incomes of potential recipients is a key aspect of private-transfer behavior. The findings have important implications for our understanding of consumer behavior.

## I. INTRODUCTION

A recent college graduate has just taken a job at a publishing house in Manhattan. The pay is low, but earnings prospects will brighten substantially as he gains experience in the business. His desired consumption expenditures are high, but his balance sheet, like his paycheck, looks bleak: $20,000 in student loans, and very little financial wealth. No bank will advance him a consumer loan. Fortunately, his well-heeled parents are willing to transfer income to him. The transfers are part subsidy, part loan, and they allow him to escape living in squalor during his first few years of work.

Stories like this might be commonplace. A liquidity-constrained consumer receives a private transfer from more fortunate friends or relatives. These kinds of transfers are potentially important, but have not received much attention in the literature.[1] This paper fills this gap by exploring empirically the connection between private transfers and liquidity constraints. The connection

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1. Ishikawa [1974] presents a life-cycle model that contains capital market imperfections and inter vivos transfers, and Blinder [1976] indicates the potential importance of inter vivos transfers for consumption behavior. More recently, Hall's discussion of Hubbard and Judd [1986] stresses the role of interfamily transfers in gauging the severity of liquidity constraints. Mariger [1986] also addresses this issue. And Altig and Davis [1987] focus on the interaction of borrowing constraints and private transfers in their analysis of unfunded Social Security programs and government debt policies. Discussions like this are infrequent, however, and are necessarily based on impressionistic evidence, due to the paucity of data in this area. Empirical work on the connection between liquidity constraints and intergenerational transfers is scant.



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is important because liquidity constraints can affect macro stabilization policy. If a large fraction of consumers face quantity constraints on loans or extremely high borrowing rates, then tax cuts may be an effective stabilization tool. If, instead, consumer behavior follows the Life-Cycle–Permanent Income Hypothesis, the scope for tax cuts as a stabilization tool is narrowed [Tobin and Dolde, 1971]. The prevalence of liquidity constraints enters the Ricardian-equivalence debate [Bernheim, 1987; Yotsuzuka, 1987]. Consumers who face borrowing constraints may not be indifferent between tax and deficit finance of government expenditures.[2] Liquidity constraints can affect the labor market (e.g., Baily [1974]). Workers who have difficulty borrowing, for example, might favor jobs with flatter and less volatile age-earnings profiles. Liquidity constraints can reduce investment in human capital [Becker and Tomes, 1986]. They affect assessments of social insurance and tax policy [Hubbard and Judd, 1986].

Most studies reject the hypothesis that consumption is determined by the Life-Cycle Model for all consumers. Hayashi [1987] surveys a variety of consumption studies using both aggregate time-series and household microdata. All seven aggregate time-series and six of the eight microdata studies indicate that liquidity constraints may be important for a fraction of the population. Recent papers by Zeldes [1989] and Wilcox [1989] corroborate these findings.

While there is much evidence that liquidity constraints are likely to prevail for some, we know much less about *why* they might exist. In a world with imperfect information, where lenders cannot observe directly the probability of default, loan contracts may be written with quantity constraints or differential loan rates [Jaffee and Russell, 1976; Stiglitz and Weiss, 1981]. Models that focus on informational imperfections are usually characterized by lenders who cannot perfectly observe default probabilities for any consumer, but a more realistic formulation would include borrowers who have established their reputations. For example, suppose that the pool of potential borrowers is comprised of defaulters and nondefaulters. Further, some borrowers have established their reputations as one or the other; for them the information is public. For the rest it is private. In a world of atomistic consumers,

2. Hayashi [1987] stresses that the interaction between policy and consumer behavior depends on the nature of borrowing constraints. A precise definition of the term "liquidity-constraint" for the purposes of this paper is provided in the next section.

nondefaulters who have not established their reputations might still face credit rationing.

But consumers are not isolated; linkages exist between them. Two linkages are considered below. The first is utility interdependence, where one consumer's well-being depends on that of others. The second is an informational linkage, in which one consumer knows another's default probability, though banks do not.

These linkages open up the possibility that consumers who would otherwise be liquidity-constrained can pursue nonliquidity-constrained consumption plans by receiving private transfers. The timing of these transfers is important. They must occur when the recipient's optimal consumption exceeds his current income. Bequests are unlikely to be timed correctly, except by chance. Private transfers used to alleviate liquidity constraints would have to occur between living people (inter vivos transfers).

Though the literature on private intergenerational transfers focuses almost exclusively on bequests, the majority of private transfers occur inter vivos.[3] The aim of this paper is to determine whether inter vivos transfers are targeted toward liquidity-constrained consumers. I use a data set that contains information on private transfers, consumer balance sheets, income and demographic data for a cross section of families. Before analyzing the data, however, I briefly elaborate some of the ideas about inter vivos transfers discussed above.

## II. Transfers and Liquidity Constraints

Consider a simple two-period model comprised of two individuals, a parent and child. The parent cares about the child's well-being. His objective function is

$$(1) \qquad U = U_1(C_{p1}, V_1(C_{k1})) + [(U_2(C_{p2}, V_2(C_{k2}))/(1 + \rho)],$$

where

$U_i$ = parent's utility in period $i$, $i = 1,2$,
$V_i$ = child's utility in period $i$, $i = 1,2$,
$C_{ji}$ = consumption of person $j$ in period $i$, $j = p,k$, $i = 1,2$,

3. A lower-bound estimate of the fraction of inter vivos to total (inter vivos plus bequests) transfers is 60 percent. Kotlikoff and Summers [1981] estimate aggregate bequests to be \$28.9 billion in 1974, which implies a 1979 figure of about \$40 billion. Kurz [1984] puts the value of aggregate inter vivos transfers at \$63 billion in 1979. This figure (which is derived from the data used in this study) does not count the value of shared living arrangements accruing to adult children or in-kind services exchanged among households.

and

$\rho$ = the subjective rate of time discount.

The function $U$ is increasing and concave in each argument, and for simplicity, the subjective rate of time preference is assumed equal for parent and child.[4]

The parent has access to capital markets, but the child does not, so that

$$C_{p1} + \frac{C_{p2}}{1+r} + T_1 + \frac{T_2}{1+r} = E_{p1} + \frac{E_{p2}}{1+r}, \tag{2}$$

and

$$C_{ki} = E_{ki} + T_i \qquad i = 1,2, \tag{3}$$

where

$E_{ji}$ = earnings of person $j$ in period $i$, $j = p,k$, $i = 1,2$,
$T_i$ = transfers from parent to child in period $i$, $i = 1,2$, and
$r$ = the market rate of interest.[5]

The final constraint is that the child not incur a reduction in well-being from being linked to the parent:

$$V_1(E_{k1} + T_1) + \frac{V_2(E_{k2} + T_2)}{1+\rho} \geq V_1^{\circ}(E_{k1}) + \frac{V_2^{\circ}(E_{k2})}{1+\rho} = V^{\circ}, \tag{4}$$

where $V^{\circ}$ denotes the child's "threat-point" utility.

Interior solutions for transfers allow the child to pursue a nonliquidity-constrained consumption path. Consider first the altruism case, in which condition (4) is nonbinding, so that parental transfers boost child utility. Parental access to capital markets implies proportionality between his marginal utility of consumption in periods 1 and 2 (i.e., the Euler condition). And operative, altruistic transfers generate proportionality between parent and child marginal utility of consumption in each period. If the parent's

4. This depiction of altruism, where the beneficiary's utility level is included as an argument in the altruist's utility function, is similar to the specification used by Barro [1974] and Becker [1974, 1981a, 1981b]. Alternative specifications include a measure of the beneficiary's wealth or income as an argument in the altruist's utility function (e.g., Becker and Tomes [1976, 1979], Menchik and David [1983]) or a family utility function in which the consumption of individual family members are substitutes (e.g., Cox and Raines [1985]).

5. The term "liquidity constraint" is used for a variety of restrictions in capital markets (see Hayashi [1987]). The analysis below would not be affected by adopting alternative specifications for liquidity constraints, such as nonzero quantity restrictions on loans or differential borrowing rates.

weighting of child utility is time-invariant, these imply that the Euler condition holds for the child as well:

$$V_1' = (1 + r)/(1 + \rho)\ V_2'. \tag{5}$$

Now suppose that equation (4) binds. This is the lending, or exchange, regime. Though the parent cares about the child, initial conditions are such that he does not want to increase the child's well-being.[6] The parent would still be willing to make a consumption loan with above-market interest.[7] The loan, which is repaid in the second period, lets the child follow a consumption path given by (5). So, in either regime the Euler equation is obtained for the child.[8]

The first issue is the existence of an interior solution for transfers. The child's marginal utility of consumption at the endowment point (where transfers equal zero) is $\partial V_i/\partial E_{ki} i = 1,2$. Transfers occur if

$$t = \frac{\partial V_1}{\partial E_{k1}} - \left(\frac{1 + r}{1 + \rho}\right)\frac{\partial V_2}{\partial E_{k2}} > 0. \tag{6}$$

From the concavity of the utility function, $\partial t/\partial E_{k1} < 0$, $\partial t/\partial E_{k2} > 0$. The latent variable $t$, which determines whether a transfer occurs, is inversely related to contemporaneous earnings and positively related to future earnings.[9]

6. For example, the child's income relative to that of the parent may not be low enough to prompt an altruistically motivated transfer, or the child's well-being may receive low weighting in the parent's utility function.

7. I assume that the child will honor his commitments and repay parental loans. The parent knows this, but financial intermediaries do not. This situation corresponds to the informational linkage discussed above. While the child honors his commitments, I assume he cannot make borrowing arrangements with anyone else; the parent is the only source of funds. This assumption is not necessary but simplifies the exposition. Finally, the child is willing to borrow at rates higher than the market rate of interest. The parent, therefore, has an incentive to lend to the child because he can earn an above-market rate of return on his saving. For simplicity, loan repayments take the form of monetary payments. A more realistic formulation would include repayments in the form of in-kind child services [Bernheim et al., 1985; Cox, 1987]. Adopting this more complex setup would not alter the comparative statics results of interest here.

8. Altig and Davis [1989] raise some subtle issues about the interaction between borrowing constraints and inter vivos transfers. They show that altruistically motivated transfers are never strong enough to overcome binding borrowing constraints in the following sense. If a transfer recipient is free to borrow, and does, removal of credit usage will never cause a boost in private transfers large enough to put him back on the Euler path. Intergenerational lending rules out this possibilty—interior solutions for transfers generate the Euler condition.

9. If transfers are motivated solely by parental altruism (i.e., no lending), and utility is time-separable (as in (1)), the transfer decision is determined solely by contemporaneous parent and child "endowment-point" marginal utilities of consumption, and the child's future income would not affect the latent variable for current transfers.

In the altruist regime the latent variable $t$ is positively related to parental earnings $E_{pi}$. In the lending regime a positive relationship would exist given a connection between parental earnings and the market interest rate faced by him.

The sign hypotheses of the comparative statics for transfer amounts ($T$) match those associated with transfer events ($t$) in the altruist regime. The lending regime can produce a different pattern. Given an interior solution, it can be shown that the first-period transfer need not be inversely related to $E_{k1}$. An increase in $E_{k1}$ raises the child's threat-point utility, making borrowing terms more favorable. This can produce a positive relationship between current earnings and transfer amounts.[10]

## III. Additional Issues

### A. Many Consumers

The distinction between altruistic subsidies and selfish loans is a key factor determining the fraction of liquidity-constrained consumers in the aggregate. Bernheim and Bagwell [1988] demonstrate that an economy with many consumers linked by blood and marriage has the potential for ubiquitous linkages. Altruism is transitive. The probability of complete linkage, even among a large group, is close to unity. If just one of a group of altruistically linked consumers can use capital markets to transfer future income to himself, they all can pursue nonliquidity-constrained consumption paths. The only way a consumer would be unable to borrow is if no linkages to nonconstrained consumers exist. With altruism this is unlikely.

With exchange-motivated transfers, linkages are less widespread. Informational links are less likely to be transitive. Person A may think B a good credit risk; and B may regard C a good risk; but A need not be willing to lend to C. With self-interested lending, the probability of complete linkage is lower than with altruism. Liquidity-constrained consumers are likely to remain after transfers take place.

### B. Human Capital

For simplicity, the model is cast in terms of consumption subsidies or loans. But many transfers are related to human capital

10. This result is obtained in the Nash bargaining context as well. The connection between transfer amounts and earnings is explored in a different context in Cox [1987].

investment [Drazen, 1978; Becker and Tomes, 1979]. They may be given as tuition or allocated to those investing in on-the-job training.

Human capital considerations can be grafted onto the model without altering the predictions of interest here.[11] But the issue of human capital raises two important questions. First, which is the more relevant consumption concept: consumption flows or expenditures (which include investments in human capital or durables)? Hayashi [1982] suggests that while the Life-Cycle Hypothesis sets out to explain flow consumption rather than expenditures, the latter is likely to be the more important variable for liquidity-constrained individuals.

Second is the question of merit goods. Suppose that the parent cares about child spending patterns. The parent could pay for the child's education, hoping that schooling exceeds what the child would have chosen with an income grant of equal value. But as long as the child continues to purchase some of the merit good after transfers occur, "earmarked" transfers have the same effect as those with no strings attached [Becker, 1974]. Unless targeted toward purposes the recipient would have spent little or nothing for, these transfers are fungible. In this case, the transfer category (e.g., schooling, housing) does not matter.[12]

### *C. Transfers and Liquidity-Constraint Evidence*

Lack of explicit treatment of inter vivos transfers does not imply that empirical consumption studies mismeasure the pervasiveness of liquidity constraints. The simple model above implies that the Euler equation is satisfied for transfer recipients. Any private-transfer effects would be embodied in the time path of consumption choices upon which the Euler-equation studies are based.

Ignoring private transfers would pose a more serious problem

11. For an example of a similar model containing human capital investment, see Chiswick and Cox [1987]. Consideration of human-capital transfers adds little in this context, but the distinction can be important for evaluating the effects of debt-financed fiscal policy [Drazen, 1978]. Government bonds can change opportunity sets if the rate of return on some human capital investments exceeds that of physical ones, and enforcement of liabilities on future generations is incomplete. Drazen's results are amplified if human capital investments yield nonpecuniary returns of the sort considered by Sgontz and Pogue [1986]. Since a key aspect of the model above is that parents may be willing to lend even when banks will not, I abstract from considerations of imperfect enforceability.

12. Of course, that parent might specify expenditure patterns for the child, threatening to cut transfers if the rules are broken. These arrangements can lead to complicated games involving parental monitoring and child dissembling [Becker, 1974] and are ignored here.

for anyone attempting to gauge the fraction of liquidity-constrained consumers based on such criteria as consumption—own-income comparisons or wealth to income ratios. But researchers who have split microdata samples along these lines (e.g., Hayashi [1985], Zeldes [1986]) are primarily interested in isolating samples of *non*liquidity-constrained consumers, and point out that many of the remaining ones could be unconstrained as well.[13]

### *D. Transfers with No Liquidity Constraints*

How would the comparative statics change if liquidity constraints were not important? First, consider this question in the narrow context of operative transfers in the altruism regime of the model. With equal weighting of parent and child utility in the parent's utility function (for instance), the optimal present discounted value of lifetime transfers equalizes parent and child lifetime wealth. With no liquidity constraints, only the scalar $T_1 + T_2/(1 + r)$ is determined uniquely. Transfers could be given all at once early in life or deferred as bequests. The distinction between current and permanent income for the recipient would be irrelevant for the transfer decision. If transfers are intergenerational loans motivated by exchange, no gains from parental lending would exist, so that, in the model above, absence of liquidity constraints implies that transfer timing does not matter.

Timing matters once we step outside the simple model, however. If transfers are used to purchase services from recipients, donors will postpone payment to retain the "last word" in bargaining with offspring [Hirshleifer, 1977; Bernheim, Shleifer, and Summers, 1985]. But this motive would prompt donors to make transfers when liquidity constraints were least important. Bruce and Waldman [1986] model the timing of transfers in a perfect-capital-markets setting. They show that optimal timing of transfers is late or early, depending on the size of inefficiencies caused by

13. Income and balance-sheet information from survey microdata reveal surprisingly large numbers of families with little or no financial assets [Zeldes, 1986; Hubbard and Judd, 1986]. Zeldes reports that between 45 and 67 percent of families in the Panel Study of Income Dynamics had savings of less than two months' worth of income. A literal reading of this might suggest that more consumers are limited by current resources than the rough consensus of 20 percent implied by the Euler equation studies. Part of the difference is surely due to measurement errors in the surveys. But the discrepancy raises the possibility that private transfers, which would be reflected in one set of evidence but not in the other, could account for some of the difference.

losing the last word versus those associated with the "Samaritan's Dilemma."[14]

## IV Specification

Expression (6) above indicates that inter vivos transfers will occur if the first-period "endowment" marginal utility of consumption exceeds $(1 + r)/(1 + \rho)$ times that of the second period. An equivalent way to view the decision is that a transfer will take place if optimal child-consumption exceeds his current income. The child's optimal consumption depends on his and his parent's lifetime wealth $W_i\, i = p,k$:[15]

$$C_k^* = f(W_k, W_p). \tag{7}$$

A transfer takes place if $C_k^*$ exceeds $E_k$. Indexing individuals by $h$ and adding a stochastic component, we can express the latent variable that determines the transfer decision as

$$t_h^* = -E_{kh} + f[(W_k, W_p)_h] + \epsilon_h \tag{8}$$

and

$$\begin{aligned} T &> 0 \quad \text{iff } t_h^* > 0 \\ T &= 0 \quad \text{otherwise.} \end{aligned}$$

Assume that $\epsilon_h \sim N(0,\sigma^2)$, take a linear approximation to $f$, and denote the coefficient of $E_{kh}$ by $b_1$. We can express the probability of a transfer as

$$\begin{aligned} \text{(9)} \quad \text{prob}(T > 0) &= \text{prob}(-\epsilon_h < b_0 + b_1 E_{kh} + b_2 W_{kh} + b_3 W_{ph}) \\ &= H\left(\frac{b_0 + b_1 E_{kh} + b_2 W_{kh} + b_3 W_{ph}}{\sigma}\right), \end{aligned}$$

where $H$ is the cumulative standard normal distribution function. Using the standard probit normalization $\sigma = 1$, we can obtain asymptotically efficient maximum likelihood estimates of the $b$'s up

14. Bruce and Waldman [1990] note that recipients who anticipate future transfers will overconsume today, expecting donors to alleviate tomorrow's poverty with enhanced transfers. Donors can short-circuit this "Samaritan's Dilemma" by giving everything early, leaving recipients completely responsible for intertemporal allocation. In doing so, however, they lose the "last word" and generate inefficiencies in recipient behavior. And available evidence points to a strong desire on the part of donors to have the last word [Bernheim et al., 1985, pp. 1068–75].

15. In the exchange regime of the model, child consumption depends only on $W_k$. But $W_p$ would also influence the transfer decision to the extent that it affects the donor's access to capital markets.

to a factor of proportionality. Cross-sectional data will be used for the analysis. Since the concept of lifetime wealth or permanent income is an important feature of the model, a proxy for permanent income is needed. Following King and Dicks-Mireaux [1982], I construct a permanent income measure using data for observed current earnings, earnings-function determinants, and outside information for the error components associated with the earnings function.

Let human wealth be represented by permanent income (i.e., age-adjusted earnings purged of transitory error components). The model for permanent income is

$$W_h = X_h\beta + \delta_h, \tag{10}$$

where $W_h$ denotes permanent income, $X_h$ is a vector of observables for individual $h$, $\beta$ is the associated parameter vector, and $\delta_h$ is an individual-specific error component that measures unobserved time-invariant traits or luck. This error term has zero mean over the population and variance $\sigma_\delta^2$. Observed earnings differ from permanent income because of evolutionary movements along the earnings profile and transitory changes in earnings. Earnings in year $v$ are given by

$$E_{hv} = W_h + g(A_{hv}) + \mu_{hv}, \tag{11}$$

where $A$ denotes age and $\mu_{hv}$ represents the transitory component of earnings. The function $g$ measures the age-earnings profile. The transitory stochastic component of earnings is assumed to have zero mean and variance $\sigma_\mu^2$. The transitory and individual-specific term are assumed uncorrelated.

Two possible proxies for permanent income are available, and each contains measurement error. The first is the estimate $\hat{\beta}X_h$, the individual's position on the aggregate age-adjusted earnings profile. It ignores the individual-specific component $\delta_h$. The second is actual earnings, standardized for age. It contains $\delta_h$, but also contains the transitory error component $\mu_{hv}$. The permanent-income estimate that minimizes measurement error is a linear combination of the two. The linear combination weights the second estimate by the intraclass correlation coefficient $\alpha = \sigma_\delta^2/(\sigma_\delta^2 + \sigma_\mu^2)$ and the first by $(1 - \alpha)$. The proxy for permanent income is then

$$\hat{W}_h = \alpha[E_{hv} - g(A_{hv})] + (1 - \alpha)X_h\hat{\beta}. \tag{12}$$

This weighting procedure also insures that the error in measuring permanent income is uncorrelated with the instrument for perma-

nent income.[16] This procedure requires outside information on the intraclass correlation coefficient $\alpha$. Estimates of $\alpha$ are available from panel estimates of earnings functions (e.g., Lillard [1977] and Lillard and Willis [1978]).

Using the permanent income measures described above, the probit equation for transfers can be written as

$$t_h^* = b_0 + b_1 E_{kh} + b_2 \hat{W}_{kh} + b_3 \hat{W}_{ph} + \epsilon_h. \tag{13}$$

The sign hypotheses are $b_1 < 0$ and $b_2, b_3 > 0$.

The equation for transfer amounts is given by

$$T_h = c_0 + c_1 E_{kh} + c_2 \hat{W}_{kh} + c_3 \hat{W}_{ph} + (\eta_h | T_h > 0), \tag{14}$$

where $\eta_h$ is a stochastic component. The altruism model predicts that $c_1 < 0$ and $c_2, c_3 > 0$. The self-interested bargaining model, on the other hand, allows for the possibility that $c_1 > 0$.

## V. Data

Until recently, little information about inter vivos transfers was available. A new data set, the Presidents' Commission on Pension Policy (PCPP) survey, contains a special module that queried families about private inter vivos transfers. Though the survey focused on gathering pension-related information, it covered a representative cross section of 4,605 families. The data set is especially useful for looking at the connection between liquidity constraints and private transfers, because, in addition to the transfer data, it contains information on consumer balance sheets, income from various sources, and demographic and labor market information. Most of the survey information was collected in August 1979, and generally covers the first eight months of that year.

The survey has three types of observations. The household is defined as a group of persons living at the same address. The survey covers 3,440 households. Households were broken into 4,605 family units. A primary family unit contains a head, his or her spouse, and children under 18 who live at home. All other individuals in the household are treated as separate secondary family units. Eight

16. See King and Dicks-Mireaux [1982]. The condition that the covariance between $(\hat{W}_h - \bar{W}_h)$ and $\bar{W}_h$ equal zero implies that $\alpha^2\sigma_\mu^2 - \alpha\sigma_\delta^2 + \alpha^2\sigma_\delta^2 = 0$. Two choices for $\alpha$ fulfill the condition: $\alpha = 0$ and $\alpha = \sigma_\delta^2/(\sigma_\delta^2 + \sigma_\mu^2)$. The latter is preferred on efficiency grounds.

hundred and forty-six households had multiple family units. The rest contained one family unit.

The survey measured private transfers between family units. Respondents first reported any payments received in the past month for food, mortgages, utility bills, or property taxes or property insurance. They then reported additional transfers received from January through August 1979. These included the following: bill payments (such as medical or legal fees) not reported in the monthly categories above, contributions toward the purchase of durable goods, transfers for education, trust funds, stocks and bonds, gifts of durable goods or property, the value of use of goods or property, cash, inheritances, and miscellaneous transfers received. The respondents then reported any transfers given to individuals outside the immediate family unit from January, 1979, through August, 1979. The categories of inter vivos transfers given match those of transfers received. For the "monthly" items, however (i.e., mortgages, utilities, taxes and insurance, and food), households were only asked to report receipts. In addition to the information from the survey module on transfers, secondary family units receive an implicit housing transfer from their primary family units.

Four percent of the sample reported both giving and receiving a transfer. For purposes of the estimations below, a recipient is defined as one whose transfers received exceeds those given. Givers are those for whom the converse is true.

Since private-transfer information was collected on a family unit basis, transfers to spouses or children under 18 are not counted. The survey does not follow the exact sources of transfers received or destinations of transfers given, but proxies are available and are discussed below.

The survey contains a variety of information about assets, property income, income from government transfers, and earnings. Household balance sheet components are broken down according to a variety of types of assets (e.g., value of savings deposits, jewelry) and different types of liabilities (e.g., mortgage debt, debts owed to other families). The survey contains data for nonlabor income from many different sources (e.g., food stamps, private pensions, stock dividends). Families were asked to report earnings for the first eight months of 1979 and weekly hours worked and other work-related information such as years of employment. The PCPP survey contains a variety of demographic data including number of children, marital status, and education.

## VI. Results

### A. Permanent Income

The first step in estimating the transfer functions is to construct a measure of family-unit permanent income. Separate earnings functions are estimated for men and women. Seventy-four two-person family units contained nonmarried pairs (e.g., siblings or cousins). These were deleted, reducing the sample to 4,531 from 4,605. For family units with married couples, permanent incomes of the husband and wife are estimated separately.

Individuals earning $2,500 or less are excluded from the earnings function estimates. Twenty percent of the men and thirty percent of the women in the file had earnings below this cutoff. Selectivity-adjusted earnings function estimates are performed for the sample of earners above the threshold level.

In constructing the permanent-income measure, I follow closely the procedure used by King and Dicks-Mireaux [1982]. Age 45 was used as the standard age in constructing the empirical analogue of equation (10). For males earning above $2,500, permanent income is imputed using estimates of equation (11) with the weighting parameter $\alpha$ set to 0.5. For males earning less than the cutoff, permanent income is imputed from the structural earnings function estimate $\hat{\beta}X_h$. A cohort effect was imputed to permanent income. The assumed cohort effect is 0.75 percent—one half the average percentage increase in output per person-hour from 1957–1985. For women the same procedure is used, except that estimated labor force participation probabilities are used to adjust the permanent-income estimate. This measure is

$$\hat{W}_h \text{ prob } (E_{hv} > 2{,}500) + \$208 \text{ prob } (E_{hv} \leq 2{,}500),$$

where the probabilities are obtained from the probit equation for the occurrence of low earnings. Women with low earnings earned an average of $208.

This probit equation is presented in Table I. For males, young or old workers are more likely to have earnings below the cutoff, but young female workers are less likely to have low earnings. Low education increases the probability of low earnings for both men and women. Public transfer income is associated with low earnings as well.

Selectivity-adjusted earnings regressions for men and women are given in Table II. Variables included in the regressions are cubics in age, education, occupation, region, race, and marital

TABLE I

PROBIT ANALYSIS—DEPENDENT VARIABLE: EARNINGS OF $2,500 OR LESS[a]

| Variable | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Estimated coefficient | Asymptotic $t$-value | Variable mean | Estimated coefficient | Asymptotic $t$-value | Variable mean |
| Constant | −2.426 | −17.89 | 1.00 | −1.921 | −17.83 | 1.00 |
| Education: elementary or less | 0.571 | 6.11 | 0.15 | 0.473 | 6.03 | 0.15 |
| Age < 22 | 0.192 | 1.71 | 0.11 | −0.285 | −3.10 | 0.12 |
| Age > 65 | 1.149 | 11.46 | 0.11 | 1.447 | 14.47 | 0.13 |
| Married | −0.456 | −5.48 | 0.68 | −0.627 | −9.99 | 0.59 |
| Nonworker | 2.416 | 18.70 | 0.38 | 2.042 | 18.57 | 0.58 |
| Part-time worker | 1.125 | 6.16 | 0.05 | 1.436 | 10.94 | 0.10 |
| Financial income | $-0.361 \times 10^{-4}$ | −3.75 | 1,219.70 | $0.107 \times 10^{-5}$ | 0.40 | 1,070.70 |
| Public transfer income | $0.452 \times 10^{-4}$ | 1.46 | 222.22 | $0.540 \times 10^{-4}$ | 2.42 | 346.72 |
| Number of children under age 2 | — | — | — | −0.437 | −4.24 | 0.09 |
| Number of children aged 2 to 5 | — | — | — | −0.298 | −3.75 | 0.14 |
| Number of children aged 6 to 12 | — | — | — | −0.207 | −4.29 | 0.32 |
| Dependent variable count | 0 | 2,413 | | 0 | 2,499 | |
| | 1 | 659 | | 1 | 1,051 | |
| Observations | | 3,072 | | | 3,550 | |
| $\ln L$ | | −796.1 | | | −1,258.5 | |
| Dependent variable mean | | 0.215 | | | 0.296 | |

a. Dependent variable = 1 if earnings ≥ $2,500, 0 otherwise.

status. The selectivity terms are highly significant and indicate negative selection bias for both men and women.[17]

As indicated above, the PCPP survey does not measure the exact sources of transfers received or destinations of transfers given. The survey does contain a measure of average income from the surrounding area. This is used as a proxy for donor's permanent income. An extended discussion of this variable is deferred to a later section.

*B. Estimates of Transfer Functions*

Table III contains two estimates of equation (13) above. Equation (13) is augmented in two ways. First, separate controls for gender and marital status are included. Second, column (2) includes an additional liquidity-related variable. These variables are discussed below.

The first probit equation for transfer receipt is presented in Table III, column (1). The dependent variable takes a value of one if the family unit received one or more transfers on the PCPP list of intergenerational transfers, and zero otherwise. The estimated coefficients are highly significant, and conform to theoretical predictions. The probability of transfer receipt is *inversely* related to current income but *positively* related to the permanent income measure. At sample means, a $1,000 rise in permanent income raises the probability of transfer receipt by 0.9 percentage points. A $1,000 rise in current income lowers the probability of transfer receipt by 0.5 percentage points. The probability of transfer receipt is also positively related to the area-income measure.

The sharp difference between the effects of permanent and current income on transfer receipt supports the hypothesis that liquidity constraints affect the transfer decision. If liquidity constraints were not important, the distinction between permanent and current income would not be relevant in the transfer probit equation.[18]

A further look at the connection between liquidity constraints

17. Negative selection bias can occur if a strong positive correlation exists between market wages and the value of time in the nonmarket sector, and the variance of the latter exceeds that of the former. This result is consistent with the findings of King and Dicks-Mireaux [1981, Table 5], who find negative selection effects for both men and women in Canadian data.

18. Corroborating evidence is found in the Survey of Consumer Finances, which contains information on private transfers that is less comprehensive than the PCPP contains but has self-reported liquidity constraints. Reporting a constraint is positively associated with receipt of transfers [Cox and Jappelli, 1989].

TABLE II

LEAST SQUARES ADJUSTED FOR SELECTION BIAS—DEPENDENT VARIABLE: LOG OF EARNINGS

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| Variable | Estimated coefficient | $t$-value | Variable mean | Estimated coefficient | $t$-value | Variable mean |
| Constant | 7.704 | 34.11 | 1.00 | 7.755 | 39.81 | 1.00 |
| Age | 0.088 | 5.13 | 37.46 | 0.112 | 7.31 | 36.21 |
| Age squared | −0.001 | −3.18 | 1,593.46 | −0.002 | −6.14 | 1,486.20 |
| Age cubed | $0.500 \times 10^{-5}$ | 1.63 | 75,534.15 | $0.161 \times 10^{-4}$ | 5.36 | 67,838.90 |
| Education | | | | | | |
| Some high school | 0.082 | 2.01 | 0.15 | −0.091 | −2.47 | 0.17 |
| High school graduate | 0.222 | 6.01 | 0.39 | 0.041 | 1.20 | 0.45 |
| Some college | 0.283 | 6.93 | 0.20 | 0.172 | 4.56 | 0.19 |
| College graduate | 0.416 | 9.00 | 0.12 | 0.281 | 6.34 | 0.09 |
| Graduate/professional school | 0.327 | 5.33 | 0.04 | 0.331 | 5.18 | 0.02 |
| Occupation | | | | | | |
| Prof./technical | −0.007 | −0.14 | 0.12 | −0.203 | −5.58 | 0.11 |
| Managerial | 0.141 | 3.01 | 0.11 | −0.098 | −2.08 | 0.04 |
| Sales | 0.061 | 1.10 | 0.05 | −0.534 | −11.49 | 0.04 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Clerical | −0.245 | −4.34 | 0.06 | −0.393 | −12.60 | 0.15 |
| Craftsperson | −0.006 | −0.13 | 0.21 | −0.171 | −3.32 | 0.03 |
| Operative | −0.101 | −2.13 | 0.13 | −0.292 | −7.48 | 0.08 |
| Laborer | −0.111 | −2.06 | 0.07 | −0.435 | −5.66 | 0.01 |
| Farm | −0.162 | −2.22 | 0.02 | 0.271 | 2.66 | 0.01 |
| Services | −0.347 | −6.66 | 0.07 | −0.501 | −15.41 | 0.12 |
| Private household | — | — | — | −0.433 | −4.04 | 0.01 |
| Region | | | | | | |
| Northeast | −0.005 | 0.17 | 0.23 | −0.023 | −0.85 | 0.23 |
| North central | 0.131 | 4.48 | 0.28 | 0.006 | 0.22 | 0.29 |
| South | −0.043 | −1.49 | 0.32 | −0.065 | −2.56 | 0.32 |
| Black | −0.054 | −1.64 | 0.10 | −0.015 | −0.57 | 0.12 |
| Married | 0.113 | 4.44 | 0.72 | −0.023 | −1.13 | 0.66 |
| Selectivity variable | −0.368 | −7.51 | 0.19 | −0.554 | −13.13 | 0.28 |
| $R$-squared | | 0.34 | | | 0.26 | |
| $F$-statistic | | 52.60 | | | 36.88 | |
| Observations | | 2,413 | | | 2,499 | |
| Dependent variable mean | | 9.519 | | | 9.083 | |

The reference categories for the dummy variables are as follows: Education—none or elementary; Occupation—Directory of Occupational Title code not available; Region—West. The selectivity variables are constructed from the probit estimates in Table I. The selectivity variable (Inverse Mill's ratio) is the ratio of the ordinate of the standard normal density to the estimated probability of sample inclusion. The selectivity variables take on strictly positive values.

TABLE III
PROBIT ANALYSIS—DEPENDENT VARIABLE: TRANSFER RECEIPT[a]

| Variable | Estimated coefficient | | Variable mean |
|---|---|---|---|
| | (1) | (2) | |
| Constant | −1.687 | −1.684 | 1.00 |
| | (−13.97)[b] | (−13.94) | |
| Current earnings | $-0.212 \times 10^{-4}$ | $-0.221 \times 10^{-4}$ | 14,063 |
| | (−6.17) | (−6.36) | |
| Permanent income | $0.365 \times 10^{-4}$ | $0.362 \times 10^{-4}$ | 18,683 |
| | (6.79) | (6.73) | |
| Area income | $0.147 \times 10^{-4}$ | $0.153 \times 10^{-4}$ | 26,130 |
| | (4.08) | (4.23) | |
| Married | −0.703 | −0.684 | 0.46 |
| | (−9.77) | (−9.44) | |
| Female | 0.507 | 0.503 | 0.32 |
| | (6.47) | (6.41) | |
| Financial assets/earnings | — | $-0.117 \times 10^{-4}$ | 1.13[c] |
| | — | (−2.17) | |
| Observations | 4,531 | 4,531 | |
| Recipients | 724 | 724 | |
| Nonrecipients | 3,807 | 3,807 | |
| ln $L$ | −1843.8 | −1841.2 | |
| Dependent variable mean | 0.160 | 0.160 | |

a. Transfer receipt = 1 if net transfer from PCPP list is received, 0 otherwise.
b. Asymptotic $t$-values are in parentheses.
c. Mean of financial assets divided by mean of earnings.

and transfers is given in Table III, column (2). Here, the ratio of financial assets to current income is included as a separate regressor. Its coefficient indicates that family units with ample financial assets relative to income are less likely to receive a transfer. This evidence is somewhat less compelling than the findings for current versus permanent income, since, even in the absence of liquidity constraints, altruistic donors will attempt to narrow the disparity between the recipient's wealth and their own. More striking evidence on this issue is presented in the next section.

Table IV contains the same specification but a different definition for transfer receipt. Recall from the data description above that secondary family units receive an implicit transfer in the form of housing services. These transfers are included along with

TABLE IV

PROBIT ANALYSIS—DEPENDENT VARIABLE: TRANSFER RECEIPT[a]
(IN-KIND HOUSING TRANSFERS INCLUDED)

| Variable | Estimated coefficient | | Variable mean |
|---|---|---|---|
| | (1) | (2) | |
| Constant | −1.463 | −1.457 | 1.00 |
| | (−12.95)[b] | (−12.89) | |
| Current earnings | $-0.397 \times 10^{-4}$ | $-0.415 \times 10^{-4}$ | 14,063 |
| | (−11.65) | (−12.03) | |
| Permanent income | $0.554 \times 10^{-4}$ | $0.547 \times 10^{-4}$ | 18,683 |
| | (10.63) | (10.49) | |
| Area income | $0.243 \times 10^{-4}$ | $0.256 \times 10^{-4}$ | 26,130 |
| | (7.12) | (7.45) | |
| Married | −1.292 | −1.256 | 0.46 |
| | (−19.00) | (−18.35) | |
| Female | 0.430 | 0.421 | 0.32 |
| | (5.92) | (5.80) | |
| Financial assets/earnings | — | $-0.220 \times 10^{-4}$ | 1.13[c] |
| | — | (−4.07) | |
| Observations | 4,531 | 4,531 | |
| Recipients | 1,170 | 1,170 | |
| Nonrecipients | 3,361 | 3,361 | |
| ln $L$ | −2142.9 | −2133.3 | |
| Dependent variable mean | 0.258 | 0.258 | |

a. Transfer receipt = 1 if net transfer from PCPP list is received, or implicit housing transfer received; 0 otherwise.
b. Asymptotic $t$-values are in parentheses.
c. Mean of financial assets divided by mean of earnings.

the others in the measure of transfer receipt. The sign pattern for all coefficients is identical to the previous estimates, and the estimated coefficients are highly significant.

The demographic coefficients in Tables III and IV indicate that married family units are less likely and females more likely to receive transfers. These demographic effects are large and the implications of these findings are discussed in Cox [1987].[19]

19. There is evidence that females and nonmarried persons are more heavily involved than others in the provision of interfamily services. This would explain the demographic patterns found in Tables III and IV. Recall that private transfers do not include alimony or child support payments.

TABLE V
LEAST SQUARES ADJUSTED FOR SELECTION BIAS—DEPENDENT VARIABLE: TRANSFER AMOUNTS RECEIVED

| Variable | Estimated coefficient | Variable mean | Estimated coefficient | Variable mean |
|---|---|---|---|---|
| | (1) | | (2) | |
| Current earnings | 0.006 | 9,873 | 0.015 | 8,127 |
| | (0.47)[a] | | (1.86) | |
| Permanent income | 0.023 | 15,312 | 0.011 | 14,479 |
| | (1.46) | | (1.11) | |
| Area income | 0.030 | 26,705 | 0.039 | 26,766 |
| | (3.27) | | (6.53) | |
| Married | −299.258 | 0.22 | 67.066 | 0.15 |
| | (−1.16) | | (0.32) | |
| Female | 352.724 | 0.50 | 216.606 | 0.49 |
| | (1.78) | | (1.59) | |
| Monthly transfer[b] | −1059.340 | 0.28 | −632.217 | 0.17 |
| | (−6.53) | | (−4.95) | |
| Selectivity variable | 114.775 | 1.41 | −231.521 | 1.03 |
| | (0.60) | | (−1.63) | |
| $R$-squared | 0.09 | | 0.07 | |
| $F$-statistic | 11.49 | | 15.21 | |
| Observations | 724 | | 1,170 | |
| Dependent variable mean | 1,188 | | 1,092 | |

a. $t$-values are in parentheses.
b. Dummy variable = 1 if only transfer received is from monthly category, 0 otherwise.
*Note.* Column (1)—PCPP transfer amounts only.
Column (2)—PCPP transfers plus imputed housing transfers.

Equations for transfer amounts are presented in Table V. Both current and permanent income enter positively in each equation, but no coefficient is significant. Liquidity considerations are apparently more important for transfer decisions than amounts.[20]

Average current earnings for the sample is $14,063. Average

20. Probit equations from Tables III and IV were used to construct the selectivity terms. The constant term was suppressed to ease the collinearity problems caused by using the same vector of explanatory variables in the amount and decision equation. Simple OLS (with constant terms) show the same pattern as those in Table V. Current and permanent income coefficients are positive but not significant, and the constant terms are not significantly different from zero. The coefficients on current income, while imprecisely measured, are still far from the large negative ones implied by altruism. Subtracting two standard deviations from the current earnings coefficient in Table V, column (a), for example, yields a value of only −0.02. Further, eliminating students—who have low incomes, but receive

TABLE VI
BALANCE SHEET INFORMATION BY TRANSFER STATUS

| Variable | Recipients (1) (a) | Recipients (1) (b) | Givers (2) (a) | Givers (2) (b) | Others (3) (a) | Others (3) (b) |
|---|---|---|---|---|---|---|
| Financial assets | | | | | | |
| Mean | $ 8,932 | 6,901 | 30,660 | 27,351 | 14,652 | 16,076 |
| Median | 821 | 475 | 10,658 | 9,288 | 2,045 | 2,450 |
| Durable assets | | | | | | |
| Mean | 16,298 | 11,324 | 66,090 | 65,466 | 32,852 | 34,782 |
| Median | 1,298 | 500 | 41,050 | 44,350 | 6,500 | 8,000 |
| Percentage with Financial assets | 100.00 | 85.6 | 100.00 | 100.00 | 90.6 | 94.7 |
| Percentage with durable assets | 66.0 | 56.0 | 91.5 | 94.8 | 73.3 | 76.2 |
| *N* | 724 | 1,170 | 614 | 884 | 3,193 | 2,477 |

*Note.* Column (a)—Definition based on PCPP transfers only.
Column (b)—Definition based on implicit housing and PCPP transfers. Givers are defined as those making positive net transfers from the PCPP list or homeowning, primary family units, or both.

permanent income is $18,683.[21] Average permanent income for recipients (of both implicit-housing and other transfers) is $14,479, and average current earnings for this group is $8,127. The gap between permanent income and current earnings is $1,732 greater for recipients than for the entire sample. The average transfer received is $1,092, but this figure includes some transfers that cover only a one-month period. If these monthly transfers are put on an eight-month basis, the average value of transfer receipts is $1,783.

### *C. Assets by Transfer Status*

An important part of the theoretical section above is the idea that nonliquidity-constrained donors make transfers to liquidity-constrained recipients. Table VI presents strong evidence that this is the case. Stocks of financial and durable assets are listed by transfer status: recipients, givers, and those not involved with

relatively high tuition transfers—produces a positive and significant coefficient for current earnings in the transfer amounts equation. This finding has important implications for transfer motives, and is discussed extensively in Cox [1987].

21. Average permanent income exceeds average current income for two reasons. First, over a quarter of the persons in the sample earned less than the cutoff level of $2,500. Second, the average ages of men (40.9) and women (41.7) are each below the standard age (45) used in the construction of permanent income. Note that all income values are on an eight-month, rather than annual, basis.

intergenerational transfers (others). Since the distribution of assets is highly skewed, both means and medians are presented.

The pattern is striking. Recipients are strapped, givers are flush, and others are in-between. The median value of financial assets for those receiving implicit housing and other transfers is $475 (Table VI, column (1) (b)). The comparable value for givers is $9,288 (Table VI, column (2) (b)). The value of durable assets is also an order of magnitude greater for givers than recipients.[22]

## VII. Further Estimation Issues

### *A. Educational Transfers and Shared Living Arrangements*

Of the 1,170 transfer recipients, 169 received tuition payments. This raises a question. Perhaps the striking difference between the effects of current and permanent income on transfer receipt comes from including students. College students have above-average education, and therefore above-average permanent income and time demands associated with schooling reduce current earnings.

My first response is that transfers for schooling are an important part of the story outlined above. Transfers are channeled to those who have not yet established their reputations in the credit markets. With no liquidity constraint, a student could borrow against his future human capital to finance his education.

One might counter by arguing that if this is all there is to the results, it is common knowledge. But evidence presented below indicates that the sign difference for current versus permanent income is not simply an artifact of transfers targeted to students.

I dropped students from the sample and reestimated the transfer probit. The results are given in Table VII, column (1). The qualitative results are identical to the corresponding estimates above. Most importantly, the sign pattern for current and permanent income is the same as previous estimates, and the coefficients are significant at any popular level.

Consider another potential problem. Six hundred and forty-two of the 1,170 received all or part of their transfer in the form of shared living arrangements. One might argue that these secondary family units do not count as separate spending entities, despite the fact that they are adults.

22. Unfortunately, no reliable measures of nonmortgage debt are available from the PCPP survey, so it is not possible to determine whether recipients are able to tap standard sources of credit to finance consumption.

TABLE VII

PROBIT ANALYSIS FOR THREE SUBSAMPLES—DEPENDENT VARIABLE: TRANSFER RECEIPT[a]

| Sample[b] | (1) | | (2) | | (3) | |
|---|---|---|---|---|---|---|
| Variable | Estimated coefficient | Variable mean | Estimated coefficient | Variable mean | Estimated coefficient | Variable mean |
| Constant | −1.475 | 1.00 | −1.633 | 1.00 | −1.789 | 1.00 |
| | (−12.58)[c] | | (−11.96) | | (−12.13) | |
| Current earnings | $-0.388 \times 10^{-4}$ | 14,275 | $-0.257 \times 10^{-4}$ | 15,468 | $-0.204 \times 10^{-4}$ | 15,617 |
| | (−10.90) | | (−6.62) | | (−5.00) | |
| Permanent income | $0.474 \times 10^{-4}$ | 18,779 | $0.430 \times 10^{-4}$ | 19,639 | $0.310 \times 10^{-4}$ | 19,706 |
| | (8.77) | | (7.22) | | (4.93) | |
| Area income | $0.259 \times 10^{-4}$ | 26,080 | $0.645 \times 10^{-5}$ | 25,862 | $0.889 \times 10^{-5}$ | 25,880 |
| | (7.17) | | (1.52) | | (1.95) | |
| Married | −1.145 | 0.48 | −0.609 | 0.54 | −0.353 | 0.55 |
| | (−16.09) | | (−7.41) | | (−3.92) | |
| Female | 0.403 | 0.32 | 0.594 | 0.29 | 0.643 | 0.29 |
| | (5.33) | | (6.57) | | (6.50) | |
| Financial assets/earnings | $-0.360 \times 10^{-4}$ | 1.13[d] | $-0.962 \times 10^{-5}$ | 1.17[d] | $-0.190 \times 10^{-4}$ | 1.16[d] |
| | (−4.41) | | (−1.79) | | (−2.32) | |
| Observations | 4,353 | | 3,874 | | 3,756 | |
| Recipients | 1,001 | | 528 | | 418 | |
| Nonrecipients | 3,352 | | 3,346 | | 3,338 | |
| ln $L$ | −1,956.9 | | −1,437.2 | | −1,236.4 | |
| Dep. var. mean | 0.230 | | 0.136 | | 0.111 | |

a. Column (1): Transfer receipt = 1 if net transfer PCPP list or implicit housing transfer received, 0 otherwise.
Columns (2)–(3): Transfer receipt = 1 if net transfer from PCPP list is received, 0 otherwise.
b. Column (1): Sample of nonstudents.
Column (2): Sample of nonsecondary family units.
Column (3): Sample of nonstudent, nonsecondary family units.
c. Asymptotic $t$-values are in parentheses.
d. Mean of financial assets divided by mean of earnings.

This is a definitional issue, and it is somewhat arbitrary. When does someone officially leave the nest? One possibility is an age cutoff. If the cutoff is 18, then all family units are independent. Another definition is based on living arrangements. As long as one family unit coresides with another, the two might be considered a single spending unit. A third option is to treat all individuals linked by operative private transfers, regardless of residence, as a single spending unit.

To deal with this potential criticism, I dropped family units receiving housing transfers. Again, the probit results are the same (Table VII, column (2)). Current and permanent income enter with opposite sign, and the coefficients are highly significant. I also obtain these results after dropping both students and family units receiving housing transfers (Table VII, column (3)).

*B. Donor Income*

The PCPP survey did not ask transfer recipients to report information about their donors. Average income from the surrounding area was used as a proxy for donor income. The majority of donor-recipient pairs are geographically close, and a regression of income on area income for the sample of family units who reported giving a transfer produces a highly significant coefficient.[23]

The proxy is only an imperfect solution for the problem of omitted donor's income, however. For example, the donor's income-area income regression has a coefficient of determination of only 0.17. This leaves open the possibility that the estimates are affected by left-out donor characteristics.

For omitted donor's income to affect the results appreciably, however, a strong correlation between donor and recipient income must exist. But available evidence indicates that this is not the case. A set of empirical studies surveyed by Becker and Tomes [1986] (discussed in more detail in Cox [1987]) indicates that the relationship between parent and child earnings is weak. The studies use matched data for fathers and sons. Regressions of son's earnings on father's earnings yield coefficients and coefficients of determina-

23. A location variable is available for 358 family units reporting transfer receipts from the eight-month categories. Of these, 74 percent received at least one transfer from the immediate metro area. Assuming that monthly transfers (e.g., food) originated from nearby donors increases the proportion to 92 percent. A regression of income on area income for the sample of transfer donors ($t$-values in parentheses) yields the following:

$$\underset{}{\text{donor's income}} = \underset{(-3.47)}{-11924.1} + \underset{(13.33)}{1.616}\,(\text{area income}),\ R^2 = 0.17,\ F = 177.8,\ N = 884.$$

tion that are very low, suggesting that omitted-variable bias in the transfer estimates is likely to be slight.

Further, for the subsample of PCPP recipients who receive implicit housing transfers, the primary family unit's income can be used as an indicator of donor income. Substituting primary-family-unit income for area income for these cases produces results extremely similar to those in Tables III and IV. In particular, the current and permanent income coefficients are very close to the ones reported above and are highly significant.[24]

In addition, any bias from omitted donor's characteristics would affect the coefficients of both current and permanent income in the same direction. But the key to the liquidity-constraint–transfer hypothesis is the sign difference between these two coefficients.[25]

*C. Intraclass Correlation in Earnings*

All of the results presented so far use the King–Dicks-Mireaux technique for formulating the permanent income measure, including their assumption for the value of the intraclass correlation coefficient for earnings, 0.5. How sensitive are the results to the assumption for intraclass correlation?

I reestimated the equations in Tables III and IV, varying the assumed value for the intraclass correlation coefficient ($\alpha$), in intervals of 0.1, from 0 to 0.9. In every estimation, the same sign pattern emerges—current earnings negative, permanent income positive. And in every instance, each coefficient is significant at any popular level.

Of course, changes in the assumed value for $\alpha$ affect the point estimates. With $\alpha = 0$ the transfer effect of current earnings is three

24. Related experiments are conducted in Cox and Raines [1985] and Cox [1987]. In the latter, I estimated a probit equation for receipt of transfers from the PCPP list for a sample of nonstudent secondary family units. Entering a vector of primary-unit characteristics (income, education, age, number of children under 18, dual-earner status, and marital status) affected the coefficients of secondary-unit variables very little. In Cox and Raines [1985] a similar comparison is made for the entire sample of secondary family units using Tobit. Here the vector of primary unit characteristics does not affect the secondary-unit coefficients except in one instance: the coefficient of secondary-unit education declines when a vector of primary-unit attributes is included [Cox and Raines, 1985, p. 416].

25. There is one further wrinkle. We might expect intergenerational correlation in permanent income to exceed that of current income, making omitted-variable bias larger for permanent income. Evidence cited in Becker and Tomes [1986], however, shows that intergenerational correlation in permanent income measures is still quite low and not much higher than that of current income. Solon et al. [1987] present some new evidence to the contrary, but it is based on sibling comparisons, rather than intergenerational ones.

quarters of its corresponding value in Table III, and the effects of permanent income are somewhat higher. The same pattern occurs for the estimates in Table IV. With $\alpha = 0.9$, the impact of each measure is close in absolute value. These values for intraclass correlation are each far outside the interval of existing estimates from the literature on longitudinal earnings, however.[26]

An alternative approach is to adopt an agnostic view of the earnings process, and simply enter a vector of earnings-function variables along with current earnings, in an expanded transfer equation. These "reduced-form" estimates reinforce the findings presented above, and are contained in the Appendix.

## VIII. Conclusion

The estimates presented above indicate that private intergenerational transfers are targeted toward liquidity-constrained consumers. This finding is important, because it indicates that a primary reason why some households may face liquidity constraints is the absence of linkages to nonliquidity-constrained households. The results show that intergenerational transfers function in part as loans or subsidies used to help family units overcome liquidity constraints. The findings are also relevant for the controversy about the connection between intergenerational transfers and capital formation [Kotlikoff and Summers, 1981; Modigliani, 1988; Kotlikoff, 1988]. Many of the intergenerational transfers discussed here are likely to increase consumption flows and reduce capital formation—an exact reversal of the role of bequests in wealth accumulation advanced by Kotlikoff and Summers [1981]. Inter vivos transfers are seldom given a prominent role in consumption studies. Future research in this area should pay more attention to this important aspect of family behavior.

26. The values of $\alpha$ that maximize the log-likelihood are $\alpha = 0$ for the specification in Table III and $\alpha = 0.1$ for the one in Table IV. Adopting these estimates would not change the qualitative nature of the conclusions, but would ignore evidence from a variety of panel data sets that attests to the importance of intraclass correlation in earnings (e.g., Lillard [1977], Lillard and Willis [1978], Lillard and Weiss [1979]).

Further, note that the permanent-income coefficients in the probit analyses each exceed the corresponding current-earnings coefficients in absolute value. Recasting the specification in terms of transitory versus permanent income (i.e., $t_h^* = b_0 + b_1(E_{kh} - \hat{W}_{kh}) + (b_1 + b_2)\hat{W}_{kh} + b_3\hat{W}_{ph} + \epsilon_h$) produced positive and statistically significant coefficients for $\hat{W}_{kh}$ in each of the probit analyses in Tables III, IV, and VII.

## APPENDIX

An alternative to constructing permanent-income variables is to enter earnings function determinants, along with current earnings, in an expanded earnings function. With a slight abuse of terminology, I refer to it as a reduced-form specification. The reduced form is a more stringent test of the liquidity-constraint hypothesis, since the results for the single-variable measure of permanent income might be masking inconsistencies in transfer effects among the individual earnings-function determinants.

The results are presented in Table VIII. Before describing them, some remarks about the specification are in order. First, since inter vivos transfers and education are closely related, I use an instrumental-variables approach for years of schooling. (See note b, Table VIII.) Second, to gauge the effects of education at different points in the life-cycle, the instrument for years of schooling is interacted with age. Finally, the variable "occupation" denotes the U. S. average earnings associated with the family-unit head's Directory of Occupational Title code. (See note c, Table VIII).

The reduced-form results are consistent with earlier estimates. First, holding measured permanent-income determinants fixed, higher current earnings reduce the probability of transfer receipt. Second, with upward-sloping earnings profiles and current income constant, being younger implies higher permanent income. So the probability of transfer receipt should decline with age. For education levels greater than 9.6 years (Table VIII, column (1)) and 8.1 years (column (2)), the probability of transfer receipt declines with age. The estimated age effect is large. At sample means, being one year older reduces the probability of receiving a transfer from the PCPP list by nearly half a percentage point (Table VIII, column (1)). The corresponding value including implicit housing transfers is a full percentage point.

Holding current income fixed, more education implies higher permanent income, and should therefore be positively related to transfer receipt. But part of the positive effect is due to tuition transfers targeted to students who already have above-average education. While this is completely consistent with the ideas expressed above, the education-age interactions indicate that schooling exerts a positive effect on transfer receipt beyond the student segment of the life-cycle. Its effect is positive up to age 47 (column (1)) and 35 (column (2)). Reestimating with tuition recipients omitted (not shown) leads to the same qualitative results. The

TABLE VIII

REDUCED-FORM PROBIT ESTIMATES—DEPENDENT VARIABLE: TRANSFER RECEIPT[a]

| Variable | (1) Estimated coefficient | (1) Asymptotic $t$-value | (2) Estimated coefficient | (2) Asymptotic $t$-value | Variable mean |
|---|---|---|---|---|---|
| Constant | $-5.671$ | $-8.37$ | $-3.447$ | $-5.31$ | 1.00 |
| Earnings | $-0.112 \times 10^{-4}$ | $-4.08$ | $-0.233 \times 10^{-4}$ | $-8.51$ | 14,063 |
| Age | $0.741 \times 10^{-1}$ | 5.89 | $0.610 \times 10^{-1}$ | 5.21 | 41.15 |
| Education (years)[b] | 0.365 | 7.14 | 0.265 | 5.40 | 12.20 |
| Age × Education | $-0.768 \times 10^{-2}$ | $-6.98$ | $-0.755 \times 10^{-2}$ | $-7.37$ | 483.30 |
| Occupation[c] | $0.137 \times 10^{-4}$ | 2.77 | $0.163 \times 10^{-5}$ | 0.34 | 22,355 |
| Occupation n.a.[d] | 0.806 | 5.57 | 0.273 | 1.94 | 0.14 |
| Northeast | $-0.093$ | $-1.22$ | $-0.044$ | $-0.61$ | 0.23 |
| North central | $-0.099$ | $-1.33$ | $-0.039$ | $-0.54$ | 0.28 |
| South | 0.096 | 1.32 | 0.304 | 4.36 | 0.32 |
| Area income | $0.177 \times 10^{-4}$ | 4.37 | $0.372 \times 10^{-4}$ | 9.64 | 26,130 |
| Married | $-0.100$ | $-1.26$ | $-0.615$ | $-8.67$ | 0.46 |
| Female | 0.399 | 6.19 | 0.117 | 2.01 | 0.32 |
| Black | $-0.265$ | $-3.08$ | $-0.206$ | $-2.72$ | 0.13 |
| Observations | 4,531 | | 4,531 | | |
| Recipients | 724 | | 1,170 | | |
| Nonrecipients | 3,807 | | 3,361 | | |
| ln $L$ | $-1,703.8$ | | $-1,972.8$ | | |
| Dep. var. mean | 0.160 | | 0.258 | | |

a. Column (1): Transfer receipt = 1 if net transfer from the PCPP list received, 0 otherwise.
Column (2): Transfer receipt = 1 if net transfer from PCPP list or implicit housing transfer received, 0 otherwise.

b. Predicted value constructed from OLS on the following set of instruments: age, race, gender, percentage of adults in the SMSA with at least one year of college, mean family income in the county, state per capita public appropriations for higher education, and state proportions of high school graduates attending public colleges or universities.

c. United States average earnings associated with survey respondent's Directory of Occupational Title code. Source of average earnings: United States Bureau of the Census [1981], table 41.

d. Directory of Occupational Title Code not available.

corresponding ages up to which education enters positively are 42 and 28, respectively.

With current earnings constant, belonging to a higher paying occupation indicates higher permanent income. The occupation variable enters with expected sign, but is only significant in the specification in column a of Table VIII. The dummy for occupation-not-reported exerts a large positive effect in column (1) a probit; it is also a category that contains high earners. Part of the effect is due to nonworking tuition recipients, but dropping these still results in a large coefficient for occupation-not-reported (coeff. = 0.557, "$t$" = 3.57).

The only distinct regional pattern is that, all else equal, the incidence of transfers that include housing is higher in the South. The race coefficient is negative, but its interpretation is complex. Blacks are more likely to be credit rationed [Jappelli, 1987], which would raise the probability of transfer receipt, except that potential donors are more likely to be credit rationed as well. The variable could be picking up donor-income effects, though when characteristics of potential donors are controlled for, the race dummy enters negatively [Chiswick and Cox, 1987]. Finally, Blacks have lower permanent income, which would lower the probability of transfer receipt. Like the estimates above, the reduced-form evidence indicates that all else equal, transfer incidence is higher for unmarried and female family units. These effects are likely due to interfamily exchange [Cox, 1987]. However, though no direct evidence on the connection between marital status and credit rationing is available, Jappelli [1987] finds that two thirds of "discouraged borrowers"—people who have not applied for credit but feel they would be turned down if they did—are female. So the effect of gender on transfers could reflect in part the impact of liquidity constraints.

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