CREDIT RATIONING AND PRIVATE TRANSFERS: EVIDENCE FROM SURVEY DATA

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Abstract—This paper investigates the connection between credit rationing and private intergenerational transfers. The research is motivated by the idea that private transfers may be a source of funds for consumers who have difficulty borrowing from financial intermediaries. This idea has important implications for consumer behavior, and economists have begun to think about it, but they have given it little empirical attention. Using the 1983 Survey of Consumer Finances, we find that private transfers do tend to be targeted toward consumers who face credit rationing. But we also find that a substantial fraction of U.S. consumers are liquidity-constrained even if one allows for the possibility of private transfers.

I. Introduction

THE key feature of the life cycle–permanent income hypothesis is that consumption decisions are determined by total lifetime resources. Over the past decade, many empirical studies have rejected the idea that all consumers follow the predictions of the strict version of the theory (Hayashi, 1987). A common explanation for these findings is that some consumers are liquidity-constrained. These constraints can arise from imperfect information between financial intermediaries and consumers, resulting in loan contracts with interest rate differentials or quantity constraints. Researchers have responded to this evidence by augmenting the life cycle model to include borrowing constraints, which are typically expressed as non-negativity constraints on net worth (Hubbard and Judd, 1986; Zeldes, 1989).

The "dynastic" models of Barro (1974) and Becker and Tomes (1979) feature individuals who can be linked to others by operative intergenerational transfers. With intergenerational altruism, the dynastic family behaves as one consumer. In this context, capital-market imperfections affecting members of one generation are of little importance as long as private transfers from another can overcome them. Even without altruism, the mutual trust or low monitoring costs among family members could help overcome the informational problems that affect formal credit markets. A parent might have more faith in his child's ability to repay a loan than a bank does. Families might make informal lending arrangements to circumvent problems of informational asymmetries and transaction costs. Consumers with access to credit markets or ample wealth may be in a position to make loans to less fortunate friends and relatives who cannot borrow from financial intermediaries.

The connection between private transfers and credit rationing is important because it may determine the number of consumers who are liquidity constrained once all opportunities (both market and family) for tapping future resources have been pursued. Being denied credit by firms is a necessary—but not sufficient—condition for being constrained because consumers might obtain consumption subsidies or loans from family members or friends.[1]

To alleviate a constraint, transfer timing is important. The transfer would have to occur inter vivos rather than as a bequest. But data sets with information on private inter vivos transfers are scarce, limiting the scope of empirical inquiry into this area. The same is true for liquidity constraints. Even after deciding on the appropriate form of the liquidity constraint (interest rate

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[1] This connection between credit rationing and intergenerational transfers has recently begun to stimulate interest among economists. Hall (1986) conjectures that family members can often alleviate liquidity constraints faced by less fortunate relatives, but speculates that they rarely do. Altig and Davis (1989) explore the implications of interacting borrowing constraints and intergenerational transfers for assessing the effects of unfunded social security programs and government debt policies. Blinder (1976) suggested that private transfers could substitute for financial intermediation. Cox (1990), using the President's Commission on Pension Policy survey data, finds that the distinction between current and permanent incomes of potential recipients is an important aspect of private transfers.

differentials versus quantity constraints) finding an empirical analogue for it is difficult. Hayashi (1985) and Zeldes (1989), for example, have to rely on wealth or propensities to save to identify liquidity-constrained households. These data limitations make it difficult to explore even the most fundamental questions about credit rationing and private transfers.

We use a direct approach to explore the connection between liquidity constraints and transfers. Our data set, the 1983 Survey of Consumer Finances, contains measures of both private transfers and credit-rationing indicators. We estimate a probit model to test whether transfers are aimed at individuals who reported being denied credit. We find that private transfers do tend to be targeted toward liquidity-constrained consumers, but a substantial proportion of liquidity-constrained consumers remains after transfers take place.

The layout of the paper is as follows. In section II we explore a model of private transfers and liquidity constraints to see what kinds of transfer patterns are expected if they are used to help consumers overcome liquidity constraints. The data are presented in section III. In section IV we examine whether any empirical support exists for the idea that transfers are targeted toward liquidity-constrained consumers. In section V we analyze the extent to which transfers overcome liquidity constraints. Section VI contains our conclusions.

II. The Model

Consider a two-person family—a parent and a child—that lives for two periods. The parent (p) incorporates the child's well-being into his utility function. The child (k) is subject to the strongest form of liquidity constraint: he cannot borrow against any future income.[2] The child's consumption in period i, C_{ki} ($i = 1, 2$), is constrained to equal current earnings, E_{ki}, plus transfers from the parent, T_i. This setup is a variant of the model discussed in Cox (1990). The parent's objective function is

$$U = U_1\big(C_{p1}, V_1(E_{k1} + T_1)\big) + \frac{U_2\big(C_{p2}, V_2(E_{k2} + T_2)\big)}{(1+\rho)} \tag{1}$$

where U_i and V_i denote parent and child utility, C_{pi} is parental consumption, and ρ is the subjective rate of time preference (assumed equal for parent and child). The functions $U(.)$ and $V(.)$ are increasing and concave in each of their arguments. They also satisfy the usual regularity conditions $\lim_{C\to 0} U'(C) = \infty$, $\lim_{C\to 0} V'(C) = \infty$ and $\lim_{C\to\infty} U'(C) = 0$, $\lim_{C\to\infty} V'(C) = 0$. The parent is constrained only by lifetime resources, so that

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

where E_{pi} denotes parental earnings and r is the market rate of interest. We allow for the possibility that first-period transfers can be intergenerational loans, which the child repays with negative second-period transfers. We assume that the interest rate on such loans is at most equal to the market interest rate. This implies the non-negativity constraint

$$T_1 + \frac{T_2}{(1+r)} \geq 0. \tag{3}$$

When (3) binds, transfers function as a private loan. Otherwise, they are a consumption subsidy for the child.[3]

Assume interior solutions for transfers and that (3) is non-binding. Since the parent has access to capital markets, the Euler condition (i.e., proportionality between marginal utilities of consumption in each period) holds for him. Further, altruism implies proportionality between parent and child marginal utilities of consumption in each period. If parental weighting of child utility is

[2] Such constraints are usually explained by transactions or enforcement costs. In the Stiglitz-Weiss (1981) model, adverse selection effects are strong enough to push some consumers out of capital markets. As will be shown below, our liquidity-constraint indicator is entirely consistent with a model of pure credit rationing.

[3] An alternative formulation is to introduce an incentive-compatibility constraint: the child must not incur a decrease in utility from entering a relationship with the parent (Cox, 1990). This would open the possibility that the parent could charge above-market interest rates for intergenerational loans.

Repayments in the form of in-kind services of the sort described by Bernheim, Shleifer and Summers (1985) are probably a more realistic depiction of intergenerational loan repayments, but we do not lose anything essential by assuming they are settled in dollars.

constant over time, these conditions imply that the Euler equation holds for the child as well so that

$$V_{c1} = \frac{(1+r)}{(1+\rho)} V_{c2}. \tag{4}$$

Suppose instead that transfers are loans, so that constraint (3) binds. The child uses his parent as a bank, so again condition (4) holds.

Since transfers allow the child to smooth his consumption, an increase in E_{k1} raises his desired first-period consumption less than dollar-for-dollar, which prompts a reduction in first-period transfers. An increase in E_{k2} also raises desired first-period consumption. With E_{k1} held constant, this implies an increase in first-period transfers. The general pattern is that transfer amounts are inversely related to contemporaneous earnings and positively related to other-period earnings.[4]

The same sign pattern holds for the transfer decision. Consider, for example, the intergenerational-loans regime. The child's marginal utility with no transfers is $\partial V_{ci}/\partial E_{ki}$. Define the latent variable

$$t = \frac{\partial V_k}{\partial E_{k1}} - \frac{(1+r)}{(1+\rho)} \frac{\partial V_k}{\partial E_{k2}}. \tag{5}$$

A first-period transfer, with second-period repayment, will occur if $t > 0$, and, from the concavity of the utility function, $\partial t/\partial E_{k1} < 0$, $\partial t/\partial E_{k2} > 0$.

An alternative way of expressing the predictions of the model is to contrast the transfer effects of current earnings versus permanent income (i.e., annualized lifetime wealth). Recasting the model in terms of permanent income and E_{k1}, as opposed to E_{k2} and E_{k1}, produces comparative statics results that are qualitatively the same as those reported above. Transfers are targeted to those with low current income and high permanent income.[5]

If the child had access to capital markets, altruistic transfers could still occur, but their sole purpose would be to narrow the disparity between lifetime resources of parent and child, and timing would not matter. Additional facets of transfer behavior could make timing important for reasons besides liquidity constraints, however. For example, even if the child had access to credit markets, an intergenerational loan could have lower transactions costs than one from a bank. Private transfers could be targeted toward merit goods, which might be more important early in the life cycle (e.g., education or a down-payment for a house).[6]

III. The Data

The 1983 Survey of Consumer Finances (SCF) is well-suited for examining the connection between liquidity constraints and transfers. The advantage of using the SCF is that, unlike other surveys, it contains direct information on both transfer receipts and liquidity constraints.

The survey, described in detail by Avery et al. (1984), reports total income for 3,824 households interviewed in 1983. Respondents are then asked to report separately wage income, interest income, dividends, capital gains, unemployment compensation, public assistance, retirement and disability income, and other public transfers. They are also asked if they received private transfers: gifts, financial support from relatives or friends, and inheritances.[7]

The SCF contains a direct measure of liquidity constraints. We define a liquidity-constrained consumer as one who reports a positive answer to the following question: "In the past few years has a particular lender or creditor turned down any request you (and your husband/wife) made for credit or have you been unable to get as much credit as you applied for?"

[4] E_{k1} and T_1 can be positively related in a model that contains the incentive compatibility constraint described in fn. 3. In this instance, an increase in E_{k1} raises the child's threat-point utility (i.e., the utility associated with severing relations with the parent), making borrowing conditions more favorable.

[5] Because earnings contain stochastic components, this change of variables, while straightforward in the model, introduces econometric issues that we address in the empirical section.

[6] Other timing issues include the donor's desire to defer transfers in order to have the "last word" in bargaining with children over services given by children to parents (Bernheim, Shleifer and Summers, 1985), and strategic timing to avoid inefficient consumption decisions on the part of recipients (Bruce and Waldman, 1990).

[7] Respondents were also asked to report alimony and child support payments. Though these transfers may respond to economic incentives, our theory has little to say about them, and we assume they are court-determined and exogenous. We explain how we deal with these transfers below.

Some consumers may not apply for credit because they think that, if they did, they would be turned down. So we add to the group of liquidity constrained those households who said yes to the question: "Was there any time in the past few years that you (or your husband/wife) thought of applying for credit at a particular place but changed your mind because you thought you might be turned down?" This definition of credit rationing has been used by Jappelli (1990) in a study that investigates the extent of such constraints and the characteristics of households for which they are binding.

Since we are interested in studying the characteristics of consumers who both received transfers and were denied credit, we exclude from the sample the households who did not report an answer to these questions—a total of 763 households. We also exclude from the sample households who did not report their total income, because this measure includes private transfers. This should help reduce the problem of misreporting of private transfers: if total income is not reported, one should indeed expect transfers, which are part of income, to be subject to serious measurement errors. An additional problem is that the variable for transfer receipts overestimates the proportion of consumers who received inheritances or gifts in 1982 because the question in the SCF does not distinguish between alimony and other private transfers. To focus on non-divorce-related transfers, we exclude all divorced people from the sample.

These exclusions reduce the sample to 2,616 households. Among them 257 (9.8%) received transfers and 466 (17.8%) were liquidity-constrained. Sample means for selected variables are reported in table 1. Column (1) shows that, on average, transfer recipients are younger, have considerably less income (net of transfers received), more education and lower homeownership rates than households who did not receive transfers. The characteristics of the non-transfer recipients are reported in column (2) of table 1. The proportion of liquidity-constrained households is lower among non-recipients than among recipients—16% versus 34%.

The characteristics of consumers who are rationed out of credit markets are displayed in column (3). Nineteen percent of the consumers who had been denied loans received transfers. The proportion of transfer recipients among those who had access to credit markets (column (4), table 1) is only 8%.

Overall, table 1 indicates that (i) over a third of transfer recipients are liquidity constrained *before*

TABLE 1.—SAMPLE MEANS FOR SELECTED VARIABLES
1983 SURVEY OF CONSUMER FINANCES

Variable	Transfer Recipients (1)	Non-Recipients (2)	Liquidity Constrained (3)	Unconstrained (4)	All Consumers (5)
Proportion receiving transfers	1.0	0.0	0.187	0.079	0.098
Transfer amount	5,430.5	0.0	582.6	524.0	534.4
Proportion liquidity constrained	0.339	0.161	1.0	0.0	0.178
Turned down for credit	0.198	0.110	0.665	0.0	0.119
Discouraged borrowers	0.140	0.051	0.335	0.0	0.060
Income[a]	22,031	27,392	17,673	28,857	26,865
Income (log)	9.157	9.848	9.423	9.858	9.780
Permanent income	26,157	25,814	23,551	26,346	25,848
Permanent income (log)	9.639	9.660	9.619	9.667	9.658
Years of education	13.53	12.10	12.26	12.23	12.24
Age	35.02	46.32	34.90	47.45	45.21
Proportion married	0.529	0.715	0.582	0.721	0.697
Proportion female	0.307	0.184	0.266	0.181	0.197
Proportion black	0.078	0.128	0.240	0.097	0.123
Proportion homeowners	0.405	0.660	0.324	0.702	0.635
Number of cases	257	2,359	466	2,150	2,616

[a]Current income, transfer amount, and permanent income are in 1982 dollars.

receiving private transfers; (ii) the number of consumers who are able to circumvent credit rationing via intergenerational transfers is potentially large; (iii) credit market imperfections might affect the transfer decision.

However, the patterns of table 1 may also be explained by the presence of spurious correlation. Women receive transfers more frequently than men, for instance, and the reason could have little to do with credit market imperfections (Cox, 1987). But women are also denied credit more frequently than men. To take into account problems like these, in the next section we present a formal test of the hypothesis that, controlling for age, demographics, income and cohort effects, transfers tend to be targeted towards consumers who do not have access to credit markets.

IV. Empirical Results

The model developed in section II shows that, if transfers are targeted toward liquidity-constrained consumers, the latent variable t, which determines the transfer decision, should be inversely related to contemporaneous child's earnings, and directly related to the child's future income. Assuming that these relations are linear, one can write

$$t_i = \alpha_1 E_{k1i} + \alpha_2 E_{k2i} + \epsilon_i. \tag{6}$$

The sign hypotheses are $\alpha_1 < 0$ and $\alpha_2 > 0$, and ϵ_i represents individual's unobservable characteristics. We drop the subscript i for convenience, and approximate E_{k2} by a vector of observable variables

$$E_{k2} = \beta_0 + \beta_1 Education + \beta_2 Age + \beta_3 D, \tag{7}$$

where D is a vector of demographic characteristics which includes gender, marital status and race. Substituting (7) into (6), we obtain

$$\begin{aligned} t &= \alpha_1 E_{k1} + \alpha_2(\beta_0 + \beta_1 Education \\ &\qquad + \beta_2 Age + \beta_3 D) + \epsilon \\ &= \alpha_1 E_{k1} + \gamma_0 + \gamma_1 Education \\ &\quad + \gamma_2 Age + \gamma_3 D + \epsilon. \end{aligned} \tag{8}$$

Consider this equation in the light of the model developed in section II. In that framework any variable that indicates high expected future income, given current resources, should be positively related to the probability of receiving a transfer. For example, more schooling implies higher future income, so we expect γ_1 to be positive. Similarly, for a given level of E_{k1} and upward-sloping age–earnings profiles, being younger implies higher future income, so γ_2 should be negative.

We first analyze the transfer decision, then turn our attention to transfer amounts. Assume that ϵ is normally distributed with zero mean and variance σ^2. The probability of a transfer can be expressed as

$$\begin{aligned} \text{Prob}(T > 0) &= \text{Prob}(-\epsilon < \alpha_1 E_{k1} + \alpha_2 E_{k2}) \\ &= F\left(\frac{\alpha_1 E_{k1} + \alpha_2 E_{k2}}{\sigma}\right) \end{aligned} \tag{9}$$

where F is the cumulative standard normal distribution function.

The probit estimates, reported in column 1 of table 2, include as regressors the log of current income, education, age, and dummies for marital status, sex, race and homeownership. The coefficient estimates indicate an inverse relationship between income and the probability of receiving a transfer. At sample means, a 10% increase in current income is associated with a 0.3 percentage point decline in the probability of transfer receipt. Holding future-income determinants and age fixed, current earnings picks up transfer effects due to divergences of current earnings from the aggregate earnings profile. The negative earnings coefficient indicates, for example, that a temporary downturn in earnings could be met with an increased probability of a transfer. But a person's earnings can also differ from the aggregate earnings profile because of unmeasured ability effects that capture differences in future income. If the model is correct, the earnings coefficient is biased downward in absolute value, because transitory and permanent earnings components affect transfer behavior in opposite ways. Alternatively, if donors are more likely to transfer to those with lower unmeasured ability, the bias goes in the other direction.

An extra year of education raises the probability of transfer receipt by 1.2 percentage points, and being one year older reduces the probability by 0.2%. The coefficients of each of these three variables are significant at any popular level, and they accord with the predictions of the model. Holding current resources constant, upward-slop-

ing earnings profiles imply higher future earnings for those who are younger. More education is also associated with higher future earnings. And having more current resources lessens the probability of receiving a transfer. Further, being a homeowner is inversely related to transfer receipt.

Race and gender have strong effects on transfer behavior. Being a female-headed household adds 4.8 percentage points to the probability of transfer receipt, and the race dummy implies a subtraction of 5.3 percentage points from this probability for blacks. Blacks have lower future expected income than whites, which would explain the negative transfer effect, though other factors could be at work as well. Race differences in transfer behavior could stem in part from human capital considerations such as disparities in school quality, which would lower the permanent income of blacks. But the race effect could also be due to lower income of potential donors among blacks. Females are more likely to receive transfers, even though their future income is likely to be lower than that of males. But women are more heavily involved in the provision of interfamily services (Cox, 1987), which presumably accounts for the positive transfer effect. Recall that divorced people are deleted from the sample, so the gender effect on transfers should not be picking up the effects of alimony/child support.

In the second column of table 2 we test directly for the effect of liquidity constraints on the probability of receiving transfers. This specification contains the dummy variable signifying whether the family was denied a loan or discouraged from borrowing. The coefficient of this variable is positive, as expected, and precisely estimated (0.275 with an asymptotic t-statistic of 3.07). This finding lends support to the hypothesis that private transfers help, at least in part, to overcome credit market imperfections. The liquidity-constraint effect is substantial; being subject to credit rationing raises the probability of transfer receipt by 3.9 percentage points.

A potentially important criticism of our results is that, as forcefully underscored by Modigliani

TABLE 2.—PROBIT ESTIMATES
DEPENDENT VARIABLE—TRANSFER RECEIPT[a]
(ASYMPTOTIC t-VALUES IN PARENTHESES)

Variable	(1)	(2)	(3)	(4)
Constant	0.479	0.284	−0.032	0.275
	(1.36)	(0.79)	(−0.07)	(0.77)
Log of income	−0.223	−0.222	−0.195	−0.221
	(−6.68)	(−6.64)	(−4.64)	(−6.61)
Years of education	0.091	0.094	0.092	0.094
	(6.05)	(6.18)	(5.53)	(6.18)
Age	−0.016	−0.015	−0.015	−0.015
	(−6.29)	(−5.51)	(−4.95)	(−5.51)
Married	−0.018	−0.012	0.061	−0.011
	(−0.16)	(−0.10)	(0.44)	(−0.10)
Female	0.310	0.296	0.394	0.294
	(2.43)	(2.32)	(2.63)	(2.30)
Black	−0.506	−0.544	−0.480	−0.545
	(−3.80)	(−4.04)	(−3.34)	(−4.04)
Homeowner	−0.199	−0.156	−0.149	−0.155
	(−2.32)	(−1.79)	(−1.60)	(−1.78)
Liquidity-constrained	—	0.275	0.278	—
	—	(3.07)	(2.77)	—
Denied credit	—	—	—	0.218
	—	—	—	(2.10)
Discouraged borrower	—	—	—	0.382
	—	—	—	(2.89)
Recipients	257	257	199	257
Observations	2,616	2,616	2,376	2,616
Likelihood at binomial	−840	−840	−684	−840
Final likelihood	−717	−712	−604	−711

Note: (1) Liquidity-constraint variable omitted. (2) Liquidity-constraint variable included. (3) Sample aged 25 or over. (4) Liquidity-constraint components entered separately.
[a] Transfer receipt = 1 if transfer received, 0 otherwise.

(1984), it is quite important "whether an individual is classified as a member of another household or, instead, as an individual economic unit" (p. 19). So far, for example, we have arbitrarily decided that 18 is the age of adulthood. We have implicitly treated as private transfers, for example, the expenses incurred by the family for college education and classified as income of the recipient what is often treated as consumption of the middle-aged.

The issue is important and deserves further inquiry. We therefore reestimate the probit equation excluding households less than 25 years old, which clearly represents an upper limit for defining adulthood. This reduces the sample size by roughly 9%, to 2,376 households. The results of estimating the probit equation are presented in the third column of table 2.

Note first that, if we exclude young households, the proportion of consumers receiving private transfers drops to 8.4%, from 9.8% in the entire sample. However, the sign, significance and magnitude of the estimated coefficients and, in particular, the coefficient of the dummy for liquidity constraints, are extremely similar to the full sample estimates.

Another potential problem with the estimates is that donor income, for which we have no information, is omitted from the estimation. But outside evidence (surveyed by Becker and Tomes, 1986) indicates weak correlation between parent and child earnings, which would imply small omitted-variable bias. And estimates of transfer functions from a data set containing subsamples with characteristics of potential donors indicate that exclusion of these characteristics affects the remaining coefficients very little (Cox, 1987, 1990).

Recall that the liquidity-constraint dummy contains two components: those who were actually denied credit from a particular lender in the past few years, and those who felt that if they applied, they would be turned down (discouraged borrowers). Two-thirds of the liquidity-constrained group were actually denied credit, and the rest were discouraged borrowers (table 1, column (3)). Perhaps part of the reason why the latter group did not apply for credit is that they decided they did not need a loan after all, so that they are not truly liquidity-constrained. These two effects are examined separately in the probit estimates in column (4) of table 2. The estimates indicate that each cause of being liquidity-constrained exerts a positive effect on the probability of transfer receipt, but the "discouraged-borrower" effect is, if anything, larger.

TABLE 3.—TOBIT ESTIMATES
DEPENDENT VARIABLE—TRANSFER AMOUNT RECEIVED
(ASYMPTOTIC t-VALUES IN PARENTHESES)

Variable	Tobit		Generalized Tobit
Constant	−21,110.0		−31,622.9
	(−2.55)		(−2.25)
Log of income	−3,181.8		−433.83
	(−4.55)		(−0.19)
Years of education	2,225.6		1,782.0
	(5.85)		(1.58)
Age	−248.33		244.25
	(−3.69)		(1.16)
Married	−532.09		261.07
	(−0.18)		(0.07)
Female	5,083.5		−2,622.2
	(1.59)		(−0.51)
Black	−11,405.0		−3,057.0
	(−3.35)		(−0.36)
Homeowner	−5,027.9		−2,536.3
	(−2.28)		(−0.73)
Liquidity-constrained	5,491.5		1,054.8
	(2.42)		(0.25)
Selectivity variable	—		6,655.3
	—		(0.45)
Recipients	257	Obs.	257
Observations	2,616	R^2	0.07
Log-likelihood	−3344	F	2.01

Next we use information on transfer amounts to see how they vary with recipient characteristics. Because of the censoring of the dependent variable, Tobit is used to analyze amounts received (table 3). The sign pattern and statistical significance of the Tobit estimates in column (1) match those of the probit estimates. In particular, the estimated effect of the liquidity-constraint dummy on transfer amounts received is large ($5,492) and significant at better than the 0.05 level. But Tobit estimates are restrictive. Most importantly, the effects of the regressors on the transfer decision (i.e., the probit) and amount are constrained to be proportional. This constraint can prove to be a very poor specification of transfer behavior (Cox, 1987). In column (2) of table 3 we present Heckman's (1979) generalized Tobit estimates, which are free of the proportionality restriction.[8] In this specification, none of the regressors exerts a statistically significant effect on

[8] The inverse Mill's ratio terms for the generalized Tobit estimates are generated from a probit equation containing the regressors in column (2) of table 2 plus regional dummies.

transfer amount. These estimates indicate that while liquidity-constraint considerations matter for transfer decisions, they have little effect on transfer amounts.[9]

V. Permanent Income, Current Income and Transfers

The theoretical section above indicates that transfers help fill the gap between desired consumption and current income. Ideally, we would like to compare these measures with transfer receipts to see whether the Euler condition for consumption is fulfilled for transfer recipients. But the SCF is a cross section and lacks consumption measures. However, it is possible to gauge the importance of transfers indirectly by comparing estimated permanent income with current income and transfer amounts.

To estimate permanent income, we use a technique designed by King and Dicks-Mireaux (1982). First we estimated earnings functions for men and women. Log earnings were expressed as a function of schooling, cubics in age, occupation, region, race and marital status. Proxies for permanent income are available from two sources. The first is an individual's predicted value from the earnings function evaluated at a "standard" age (we choose 45). The problem with this estimate is that it ignores individual-specific, unmeasured determinants of earnings, such as personality traits and unobserved ability. The second source is current earnings, standardized for age using estimates from the age–earnings profile. Unmeasured, individual-specific ability effects are embodied in current earnings. But they also contain transitory error components. King and Dicks-Mireaux use a weighted average of these two sources. The weights are chosen to minimize measurement error. The larger the individual-specific source of error variance, the more weight is given to the second measure. King and Dicks-Mireaux use panel estimates of error components to determine the weights. Roughly half of the error variance is due to individual-specific effects, so each of the two measures is given equal weight in calculating permanent income.[10]

Sample means for permanent income are given in table 1. Permanent income for the entire sample is \$25,848 and current income is \$26,865. Transfer recipients have average permanent income of \$26,157 and current income of \$22,031, leaving a gap of \$4,126. Those who report being liquidity constrained have a gap as well—\$23,551 − \$17,673 = \$5,878.[11]

We can use the permanent income measures to put approximate bounds on the number of households whose liquidity constraints are alleviated by private transfers. An *upper* bound is easy to determine. Eighty-seven of those reporting being liquidity constrained also received transfers. If transfers overcome liquidity constraints for all of them the proportion liquidity constrained is reduced to $(466 - 87)/2{,}616 = 14.5\%$ from 17.8%. This is a reduction of almost one-fifth.

But some transfers are small—6% of them were less than \$200—so it is unlikely that all are

[9] When income is entered in level (rather than log) form the fit of the generalized Tobit estimates improves markedly ($R^2 = .21$) and income enters positively and is significant at the 0.01 level. The liquidity-constraint variable remains insignificant in this specification, however.

A possible factor influencing the transfer amounts equation is bequests, which cannot be separated from inter vivos transfers in the SCF data. The number of inheritors is likely to be a small minority of all recipients, but their amounts are probably much larger than inter vivos transfers, and inheritors are probably less likely to be liquidity constrained. As a result, equations for transfer amounts are likely to be affected more than probit equations by the inclusion of inheritances.

[10] A detailed description of the procedure used to impute permanent income and the estimates are contained in an appendix available on request. Earnings functions are estimated for those earning \$3,000 or more during the survey year, and are corrected for selection bias caused by the presence of low and non-earners in the sample. For males earning below the cutoff, permanent income is imputed from the earnings function alone. For women, the permanent income measure is adjusted for labor force participation probability. A cohort effect of 0.75% (one-half the average percentage increase in United States output per person-hour from 1957–85) was imputed to permanent income. The procedure originates from King and Dicks-Mireaux (1982).

[11] Substituting the permanent-income measure for the vector of permanent-income indicators in equation (8) and estimating the transfer probit leads to the same results as those reported above. Transfers are targeted toward those with low current resources and high permanent income, and being liquidity constrained matters. The probit results for the empirical analogue of equation (6) with the liquidity-constraint dummy are as follows (asymptotic t-values in parentheses):

$$t = \underset{(0.05)}{0.016} \underset{(-7.49)}{-0.235}(\text{log of current income}) + \underset{(3.23)}{0.088}(\text{log permanent income}) + \underset{(5.76)}{0.444}(\text{liquidity constrained}).$$

Recipients = 257, Obs. = 2,616, Log-likelihood = −788.

large enough to overcome constraints. An approximate *lower* bound on the number of households whose constraints are alleviated by transfers can be determined by exploring the following question: How many households get transfers that are large enough to fill the gap between their current and permanent income? Assume that permanent income equals desired consumption. (Since permanent income is evaluated at age 45, and all but six of the eighty-seven who report both liquidity constraints and transfers are younger, this proxy for desired consumption is likely to be quite high.) Fifty-nine of the 87 liquidity-constrained recipients had pre-transfer current incomes that were lower than their permanent incomes. Transfer receipts were large enough to fill the gap between current and permanent income for only 8 of these cases. For the remaining 51, transfers filled an average of 16% of the gap between current and permanent income.

These figures suggest that transfers do not overcome liquidity constraints for all recipients, and the wide bounds indicate that better data are needed to determine what proportion achieve their Euler condition through transfers (e.g., a panel with consumption and transfer data).[12]

VI. Conclusion

Our findings indicate that private transfers tend to be targeted to consumers who face liquidity constraints. And, consistent with a model of intergenerational lending, current and permanent income measures have opposing effects on the transfer decision. But many liquidity-constrained consumers remain after transfers take place. About four-fifths of liquidity-constrained consumers did not receive a transfer, and it is unlikely that all of those who received one were able to achieve their desired consumption levels.

Future research and data collection should be aimed at resolving a number of questions that cannot be addressed with the SCF data. Why don't more transfers occur? Are some potential donors liquidity-constrained or too poor to make transfers? Can intergenerational lending be subject to the same informational problems as conventional credit markets? In addition, our cross section is likely to miss many important but episodic transfers, such as help with housing downpayments, which can best be measured by retrospective survey questions. Further, panel data containing consumption and transfer data would be well-suited for determining how many transfers put liquidity-constrained consumers on the Euler path.

[12] There is also the possibility that some transfers might be a substitute for financial intermediation even among those who have access to credit markets. This could occur, for example, if private transfers involve lower transactions costs. One hundred and seventy transfer recipients were neither denied credit nor were discouraged borrowers. Of these, 107 had permanent incomes that exceeded current income. Transfer receipts exceeded the current permanent income gap for 20 of these, and for the remaining 87, transfers filled 21% of the gap.

REFERENCES

Altig, David, and Steve J. Davis, "Government Debt, Redistributive Fiscal Policies, and the Interaction between Borrowing Constraints and Intergenerational Altruism," *Journal of Monetary Economics* 24 (July 1989), 3–29.

Avery, R., G. Elliehousen, G. Canner, and T. Gustafson, "Survey of Consumer Finances, 1983," *Federal Reserve Bulletin* (Sept. 1984), 679–692.

Barro, Robert, "Are Government Bonds Net Wealth?" *Journal of Political Economy* 81 (Nov./Dec. 1974), 1095–1117.

Becker, Gary S., and Nigel Tomes, "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility," *Journal of Political Economy* 87 (Dec. 1979), 1153–1189.

_____, "Human Capital and the Rise and Fall of Families," *Journal of Labor Economics* 4, part 2 (1986), S1–S39.

Bernheim, B. D., A. Shleifer, and L. Summers, "The Strategic Bequest Motive," *Journal of Political Economy* 93 (Dec. 1985), 1045–1076.

Blinder, Alan, "Intergenerational Transfers and Life-Cycle Consumption," *American Economic Review* 66 (May 1976), 87–93.

Bruce, Neil, and Michael Waldman, "The Rotten-Kid Theorem Meets the Samaritan's Dilemma," *Quarterly Journal of Economics* 105 (Feb. 1990), 155–166.

Cox, Donald, "Motives for Private Income Transfers," *Journal of Political Economy* 95 (June 1987), 508–546.

_____, "Intergenerational Transfers and Liquidity Constraints," *Quarterly Journal of Economics* 105 (Feb. 1990), 187–217.

Hall, Robert, "Comment: Liquidity Constraints, Fiscal Policy and Consumption, by Hubbard and Judd," *Brookings Papers on Economic Activity* (1, 1986), 51–53.

Hayashi, F., "The Effect of Liquidity Constraints on Consumption: A Cross-Sectional Analysis," *Quarterly Journal of Economics* 100 (Feb. 1985), 183–206.

_____, "Tests for Liquidity Constraints: A Critical Survey and Some New Observations," in Truman F. Bewley (ed.), *Advances in Econometrics, Fifth World Congress* (Cambridge: Cambridge University Press, 1987).

Heckman, James J., "Sample Selection Bias as Specification Error," *Econometrica* 47 (Jan. 1979), 153–161.

Hubbard, R. G., and K. L. Judd, "Liquidity Constraints, Fiscal Policy, and Consumption," *Brookings Papers on Economic Activity* (1: 1986), 1–59.

Jappelli, T., "Who Is Credit Constrained in the U.S. Economy?" *Quarterly Journal of Economics* 105 (Feb. 1990), 219–234.

King, Mervyn A., and Louis Dicks-Mireaux, "Asset Holdings and the Life-Cycle," *Economic Journal* 92 (June 1982), 247–267.

Modigliani, Franco, "Measuring the Contribution of Intergenerational Transfers to Total Wealth: Conceptual Issues and Empirical Evidence," paper presented at a seminar on Modeling the Accumulation and Distribution of Personal Wealth, Paris, Sept. 10–11, 1984.

Stiglitz, J. E., and A. Weiss, "Credit Rationing in Markets with Imperfect Information," *American Economic Review* 71 (June 1981), 393–410.

Zeldes, Stephen P., "Consumption and Liquidity Constraints: An Empirical Investigation," *Journal of Political Economy* 77 (Apr. 1989), 305–346.