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ABSTRACT

What is the basic economic decision-making unit? Is it the household or the extended family? This question is fundamental to economic analysis and policy design. The answer given by the Life Cycle and Keynesian models is that the economic unit is the household. According to these models, members of particular households act selfishly and do not fully share resources with extended family members in other households. Hence, altering the distribution of resources across households within the extended family will alter the consumption and labor supply of those households who acquire or lose resources. In contrast to the Life Cycle and Keynesian models, the altruism model implies that the extended family is the basic economic decision-making unit. According to this model the extended family is linked through altruism and, as a result, acts as if it fully shares resources. In the altruism model nondistortionary changes in the distribution of resources across households within the extended family will have no effect on the consumption or labor supply of any of its members.

Despite its importance, the boundaries of economic decision-making units have not, to our knowledge, been examined directly with micro data. Stated differently, the altruism model has not been tested against the Life Cycle and Keynesian alternatives with such data. This paper uses matched data on parents and their adult children, contained in the Panel Study of Income Dynamics, to perform such a test. In essence our test asks whether the distribution of consumption and labor supply across households within the extended family depends on the distribution of resources across households within the extended family.

Our findings provide quite strong evidence against the altruism model. The distribution of resources across households within the extended family is a highly significant (statistically and economically) determinant of the distribution of consumption within the extended family. This finding holds for the entire sample as well as the subsample consisting of rich parents and poor children.

In addition to showing that the distribution of extended family resources matters for extended family consumption, we test the life cycle model by asking whether only own resources matter, i.e., whether the resources of extended family members have no affect on a household's consumption. Our results indicate that extended family member resources have, at most, a modest effect on household consumption after one has controlled for the fact that extended family resources help predict a household's own permanent income.

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What is the basic economic decision-making unit? Is it the household or the extended family? This fundamental question in economics confronts anyone attempting to understand economic exchange among family members. Associated with this question is a question of evidence – What family behavior constitutes evidence of a collective decision-making unit? Since family members may engage in selfish economic exchange with one another, the mere observation of economic exchange within families does not, in of itself, imply a collective decision-making unit. Collective choice requires mutual objectives. As demonstrated by Barro (1974) and Becker (1974,1981), altruism – the concern of one individual for the welfare of another – can lead a group of individuals to act as if it is maximizing a single preference function subject to the group's joint budget constraint. The size of such collective decision making units can be quite large. Studies by Kotlikoff (1983) and Bernheim and Bagwell (1988) have shown that altruistic linkages need not be direct; two individuals can be altruistically linked through their concern for a third individual.

For questions of public policy knowing the size and scope of economic decision-making units is of great importance. As Barro stressed, nondistortionary government redistribution among members of an altruistically-linked economic unit will not alter the collective budget constraint and will not, therefore, alter any of the unit's economic choices. If large altruistically-linked economic units exist, this line of argument implies that private behavior will neutralize most, if not all, of the government's intergenerational and intragenerational redistribution.

Notwithstanding the importance of identifying the boundaries of economic units and, therefore, understanding the extent of altruism, empirical research has not produced clear cut conclusions on this subject. The consumption Euler equation approach (see Hayashi 1987 for a survey), while capable of discriminating between the Keynesian and life cycle alternatives, is silent on the issue of altruism because the Euler consumption equation is valid for both the life cycle and altruism hypotheses. There are a number of studies of wealth decumulation which bear on the issue of altruism;[1] a fair summary of the findings in this literature is that some elderly appear to decumulate wealth, while others do not. Decumulation, on average, is rather limited. Also, as argued in Hayashi, Ando, and Ferris (1988), a downward-sloping age-wealth profile, which is a primary prediction of the life cycle hypothesis, is also consistent with altruism if wealth decumulation is due to transfers from the elderly to their offspring.

One might think that directly studying transfers (see Cox 1987 for a survey of the literature) would be a more appropriate way to test altruism than studying consumption. However, in the absence of liquidity constraints (see Becker, 1974, Drazen, 1978, and Altig and Davis, 1989) or strategic considerations (see Linbeck and Weibull, 1988, and Bruce and Waldman, 1988, 1989), the timing of transfers is arbitrary in altruistic models. Secondly, transfers are difficult to measure since they may be in kind or in forms, such as partnership shares, whose prices are not available. Third, transfers may arise for nonaltruistic reasons, and the mere occurrence of transfers is not, in itself, evidence of altruism.

In contrast to the analysis of transfers, the analysis of consumption does permit sharp tests of altruism, by which we mean operative altruistic linkages. Surprisingly, there has been very little consumption-based research testing altruism. The explanation lies in the paucity of data sets that combine information on the extended family. One important exception is the University of Michigan's Survey Research Center's Panel Study of Income Dynamics (PSID). A little known fact (at least to non-PSID aficionados) is that the PSID includes "split-offs" of children who were under 18 in the original 1968 sample, but left their parents' household after age 18. The PSID surveys on an ongoing basis the new households set up by the 1968 PSID children. By combining data on food consumption, income, assets, transfers, and household characteristics for the adult children of the original survey respondents with the same data for the survey respondents themselves, one can use the PSID to form a unique and rich data set covering at least a portion of the extended family.[2]

In this paper we use the PSID extended family data to test directly the assumption of operative altruistic linkages between parents and children against the alternative of zero linkage. The intuition behind these tests is quite simple, particularly in the case of exogenous labor supply. In this case, if parents and children are altruistically linked their consumption will be based on a collective budget constraint, and the distribution of consumption between parents and children will be independent of the distribution of their incomes. We emphasize that this primal prediction of altruism is a static condition and is independent of how the dynasty allocates consumption intertemporally. Therefore, in contrast to the Euler equation approach, our basic test of altruism operates with data on the level of consumption and income. In contrast to the altruism model, the non-altruistic pure life cycle model predicts that the distribution of incomes is a critical determinant of the distribution of consumption between parent and children.

While this simple idea underlies our tests, the actual form of our tests involves specifications of Frisch demand functions. Frisch demands are functions of the marginal utility of income and of prices. An implication of the altruism model's single collective budget constraint is that parents and children have the same marginal utility of income. In contrast, under the life cycle model parents and children maximize their own preferences subject to their own budget constraints and have different marginal utilities of income. Under both the altruism and life cycle models one can express the consumption and leisure choices of parents (children) as Frisch demand functions of the parents' (children's) marginal utility of income and of prices. However, under the altruism model the marginal utility of income entering the children's demand functions is the same as that entering the parents' demand functions. In contrast, under the life cycle model the parents' and children's marginal utilities of income need not be related.

In our parametrization of the Frisch demand functions, the marginal utility of income is captured by a fixed effect in consumption demand regressions. Given that we control for this fixed effect, the exogenous incomes and asset positions of parents (children) should not, according to the altruism model, enter into our estimated Frisch demand functions for the parents' (children's) consumption. Under the life cycle hypothesis, in contrast, knowing the parent's fixed effect will not control perfectly for the child's fixed effect, and vice versa; hence, the exogenous incomes and asset positions of parents and children should enter into our estimated Frisch demand functions.

After estimating Frisch demands for consumption at a point in time, we combine the data over time and estimate the first differences of the Frisch demands. We find strong evidence against the altruism model both in the levels and first differenced estimates of the Frisch demand functions.[3] It appears that the distribution of consumption between parents and children is highly dependent on the distribution of their incomes.

In addition to showing that the distribution of extended family resources matters for extended family consumption, we test the life cycle model by asking whether only own resources matter, i.e., whether the resources of extended family members have no affect on a household's consumption. Our results indicate that extended family member resources have at most a small effect on household consumption after one has controlled for the fact that extended family resources help predict a household's own permanent income.

Our rejection of operative altruistic linkages accords with most of the limited evidence on altruism based on transfer data. Cox (1987), for example, finds that, controlling for the donor's income, the amount of transfers increases with the income of the recipient. Behrman, Pollak, and Taubman (1989) using data on transfers and asset in the PSID with split-offs conclude that transfers are not large enough to offset earnings differences between siblings. These results are consistent with exchange-based models of transfers, but not altruism. Our results also accord with the time series findings of Boskin and Kotlikoff (1986) and Boskin and Lau (1988), both of which test whether the age distribution of income affects aggregate consumption.

Our rejection of the altruism model is also in agreement with some of the findings in the cohort analysis of Abel and Kotlikoff (1988). Abel and Kotlikoff test the altruism model's prediction that consumption growth of different age groups should be identical at any point in time (after controlling for demographic change and measurement error) since the age distribution of resources should not affect the age-distribution of consumption. While Abel and Kotlikoff cannot reject the altruism model using just data on consumption, they do find, in contrast to the altruism model's prediction, that the consumption growth of different cohorts depends on the cohorts' own income growth. Their analysis using cohort income data is, essentially, the first differenced version of our Frisch demand test for altruism. As discussed below this finding is consistent with altruism or with selfish risk pooling.

Several independent studies that are methodologically similar to one of our altruism tests are Mace (1988), Cochran (1988), and Townsend (1989). Mace and Cochran use the PSID (without split-offs) and the Consumer Expenditure Survey, respectively, to test perfect risk sharing in the U.S. economy which would imply correlated changes in consumption across different households. Mace accepts, while Cohran rejects the risk sharing proposition. Townsend also uses consumption data to test for risk sharing, but in this case within three villages in India. He finds that changes in consumption of individual households within the villages are highly correlated, even though income changes of villagers differ dramatically; on balance Townsend finds significant risk pooling within each of his three villages. Rosenzweig (1988), using transfer data, also finds significant risk pooling within Indian villages.

The paper proceeds in Section II by developing our empirical tests of altruism. Section III describes the linked PSID data. Sections IV contain, respectively, our findings from static and dynamic tests of altruism. Section V presents results of tests that take the life cycle model, rather than the altruism model, as the null hypothesis. And Section VI summarizes and concludes the paper.

II. Testable Implications of the Altruism Model

A. A Static Illustration

To see in the simplest possible terms the force of altruism, consider the case of a parent who is altruistic toward a child, but whose child is not altruistic toward the parent. Suppose the parent's utility function is given by $U_p = \theta_p U(C_p) + \theta_k U(C_k)$, where C_p stands for the parent's consumption, C_k stands for the child's consumption, and θ_p and θ_k are the respective weights the parent attaches to his own utility from consumption and to the child's utility, $U(C_k)$. The child's consumption, C_k, will equal the child's resources, R_k, plus T, the transfer made to the child, i.e., $C_k = R_k + T$. The parent's consumption will equal the parent's resources less the transfers to the child, i.e., $C_p = R_p - T$. These two constraints imply the combined budget constraint: $C_k + C_p = R_k + R_p$.

Suppose that the child takes the parent's transfer as given. Then the parent's choice of his own consumption and transfer (assuming it is positive) leads the parent to set $\theta_p U'(C_p) = \theta_k U'(C_k) = \lambda$, where λ is the marginal utility of income. This first order condition and the collective budget constraint can be used to solve for C_p and C_k. Hence, as first shown by Becker (1974) and Barro (1974), the parent and child act as if they are maximizing the parent's utility function subject to the combined budget constraint. This type of outcome is generic in one-sided, two-sided, or, indeed, many-sided altruistic models assuming that recipients of transfers take such transfers as given, i.e., the game between the donor and recipient is noncooperative Nash and there are positive (operative) transfers.[4]

Next assume that the utility function is of the isoelastic form, $U(C) = C^{1-\gamma}/(1-\gamma)$. From the first order conditions we have $\log C_p = -(1/\gamma)\log\lambda + (1/\gamma)\log\theta_p$ and $\log C_k = -(1/\gamma)\log\lambda + (1/\gamma)\log\theta_k$. Obviously, C_p will exceed C_k if θ_p is greater than θ_k. If the true values of C_p and C_k differ from the measured values, $C^m{}_p$ and $C^m{}_k$, by multiplicative errors, whose logarithms we denote u_p and u_k, respectively, we have the following statistical representation of the Frisch demand system:

$$\log(C^m_{ip}) = -(\frac{1}{\gamma_i})\log\lambda_i - (\frac{1}{\gamma_i})\log\theta_{ip} + u_{ip} \tag{1}$$

$$\log(C^m_{ik}) = -(\frac{1}{\gamma_i})\log\lambda_i - (\frac{1}{\gamma_i})\log\theta_{ik} + u_{ik} \tag{2}$$

In (1) and (2) the subscript i refers to parent/child pair i. With data on a sample of parent\child pairs one can estimate (1) and (2) jointly treating the terms $\log\lambda_i$ for each parent\child pair as a fixed effect.[5] Since controlling for the fixed effect fully controls for the combined resources of the parent and child, one can test the model by asking whether the parent's resources, R_{pi}, enters into the parent's consumption equation and whether the child's resources, R_{ki}, enters into the child's consumption equation.[6] The altruism model predicts zero coefficients on own resources, controlling for combined resources. In contrast, the Life Cycle and Keynesian models predict that own resources are significant determinants of own consumption. As we show below this basic test procedure carries over to more realistic dynamic models with multiple consumption goods, uncertainty, and endogeneous labor supply.

B. Two-Sided Altruism

Before turning to those issues we need to remark on how the results of the proposed test should be interpreted if altruism is two-sided altruism. By two-sided altruism we mean that the child cares about the parent's utility and vice versa. In terms of the simple model let the parent's utility function be as before: $U_p = \theta_p U(C_p) + \theta_k U(C_k)$, but let the child's utility function be given by: $U_k = T_p U(C_p) + T_k U(C_k)$.[7] Further assume that $\theta_p/\theta_k > T_p/T_k$, i.e., that both the parent and child weigh their own utility from consumption higher than they weigh their relative's income. It is easy to see that there will be three transfer regimes depending on the division of Y between the parent and child. If the parent's share of total (parent plus child) resources exceeds a critical value, denoted s_p, the parent will make net transfers to the child and the parent's consumption will exceed that of the child. If the parent's share is less than a critical value, s_k, (where $s_p > s_k$) the child will make net transfers to the parent, and the child's consumption will exceed that of the parent. For parental resource shares between s_p and s_k there will be zero net transfers since both the parent and child will wish to consume more than their share of the total resources. In this regime (in a static context) the ratio of the parent's consumption to the child's consumption will equal the ratio of their resources. Suppose the parent's resource share exceeds s_p (is less than s_k), then changes in the resource distribution that leave the parent's share above s_p (below s_k) will have no effect on the ratio of C_p to C_k. However, changes in the resource distribution that change the transfer regime will be associated with changes in consumption shares.

Hence, one response to a finding of a significant own resource coefficient in the fixed effect test discussed above is that extended families are indeed altruistic, but that the test is simply capturing the fact that transfer regimes change as the distribution of resources changes between parents and child. While this may be true, its implication with respect to Barro's neutrality proposition, at least for large government redistributions between parents and children, is the same as if there is no altruism, namely that such government redistribution is not neutral. One way to test whether the Barro proposition holds for small government redistributions - those that are not likely to alter the transfer regime - is to focus on the subset of parent and child pairs in which the parent's resource share is much larger than that of the child. For this subset of observations all of which have a parental resource share above s_p one would expect no correlation between consumption and resource shares. While we don't know precisely the resource shares of our parent and child pairs, we can conduct this more refined test of altruism by running our fixed effects test for parent-child pairs in which the parent has high income and the child has low income.

C. A Dynamic Formulation

Given that within a transfer regime the standard altruism model can be summarized by the maximization of a single objective function subject to a single collective budget constraint, we proceed by referring to the extended family as the dynasty and by expressing the general problem of the dynasty as:

$$\max \quad E_t\left(\sum_{s=t}^{\infty} b^s \, U(Z_s, p_s; x_s)\right) \quad \text{subject to} \quad A_{t+1} = (1+r_t)A_t + Y_t - Z_t, \tag{3}$$

where

$$Y_t = \sum_{k=0}^{m_t} Y_{kt},$$

and E_t = expectation operator,
m_t = number of households in the dynasty at time t,
Y_{kt} = labor earnings of the k-th household of the dynasty at time t,
Z_t = total nominal consumption expenditure by the dynasty at t,
A_t = the dynasty's wealth at time t,
r_t = nominal interest rate at time t,
x_{kt} = vector of demographics for the k-th household at time t,
x_t = vector consisting of x_{kt} ($k = 0,1,\ldots,m_t$),
p_t = vector of commodity prices
b = discount factor.

In (3) we assume that labor supply is exogenous. The dynasty's indirect intertemporal utility function $U(Z_t,p_t;x_t)$ is defined as the maximized value of the following static optimization problem:

$$\max_{\{C_{kt}\}} \quad \sum_{k=0}^{m_t} u(C_{kt};x_{kt}) \qquad \text{subject to} \quad p_t' \sum_{k=0}^{m_t} C_{kt} \le Z_t, \tag{4}$$

where $u(C_{kt};x_{kt})$ is the dynasty's time t utility from the vector of consumption of household k, C_{kt}, with demographic characteristics x_{kt}. The term p_t stands for the time t price vector.

The key prediction of this more general model – namely that resources are shared by altruistically-linked individuals within the dynasty and, therefore, by households within the dynasty – can be formalized as follows. Let λ_t be the scalar shadow price for the budget constraint in (3). Then the first order conditions from the maximization in (4) imply the Frisch demand functions:

$$C_{kt} = f(\lambda_t, p_t; x_{kt}) \qquad k = 0,1,\ldots,m_t, \tag{5}$$

As suggested above, the important point here is that the scalar shadow price λ_t, which is a "sufficient statistic" for dynasty resources at time t, is common across dynasty members, while in the life cycle hypothesis it depends on the household identifier k. For a wide range of utility functions the shadow price λ_t can be treated as a component of a fixed effect. In the case of exogenous labor supply, since the price vector p_t is also common across dynasty members, the fixed effect can also depend on prices. Since the only consumption component available in our data is food consumption, we now focus on the food component of (5) and require that the Frisch demand function for food be of the form:

$$f_{kt} = h(x_{kt}, p_t) + \alpha(p_t, \lambda_t) \tag{6}$$

where f_{kt} is either the level or the logarithm of food consumption. Since the $\alpha(\ ,\ )$ function does not depend on k, we treat it as a fixed effect.

A large class of utility functions satisfy the Frisch demand specification given in (6). The class includes the familiar CES and constant absolute risk aversion functions. Consider the CES form of the household utility function u( ) given in (7).[8] In (7) d( ) is an arbitrary function that depends on demographics. So too are the weight functions $\delta_{ktj}(x_{ktj})$ that apply to commodity j from j equals 1 through q, the number of commodities. If the coefficient ν equals ρ, the function collapses to the isoelastic form.

$$u(C_{kt};x_{kt}) = d(x_{kt})[\delta_{kt1}(x_{kt})C^{\rho}_{kt1} + \delta_{kt2}(x_{kt})C^{\rho}_{kt2} + \ldots + \delta_{ktq}(x_{kt})C^{\rho}_{ktq})]^{\nu/\rho} \tag{7}$$

If u( ) is given by (7), then f_{kt} in (6) stands for the logarithm of food consumption, and the $\alpha(\ ,\ )$ function is independent of prices and equals $\log\lambda_t/(\upsilon-1)$.

A disadvantage of this utility function is that its Engel curves are unitary elastic with respect to total expenditures. While our food expenditure variable includes food at restaurants, the assumption of unitary income elasticities may not be appropriate. An example of a preference structure that satisfies (6) with f_{ikt} standing for the logarithm of food consumption, but for which income elasticities do not necessarily equal unity, is given in (7'):

$$u(C_{kt};x_{kt}) = \delta_{kt1}(x_{kt})C_{kt1}^{\rho_1} + \delta_{kt2}(x_{kt})C_{kt2}^{\rho_2} + \ldots + \delta_{ktq}(x_{kt})C_{ktq}^{\rho_q} \tag{7'}$$

Next consider the constant absolute risk aversion form of u( ) given in (8):

$$u(C_{kt};x_{kt}) = -g(x_{kt})[b_{kt1}(x_{kt})e^{-\nu C_{kt1}} + b_{kt2}(x_{kt})e^{-\nu C_{kt2}} + \ldots + b_{ktq}(x_{kt})e^{-\nu C_{ktn}}] \tag{8}$$

where g( ) and the b_{ktj}( ) (j=1,q) are arbitrary functions of the household's characteristics.[9] If this form for u( ) holds, then f_{kt} in (6) refers to the level of food consumption, and the α(,) function again is independent of prices.[10] In this case $\alpha(\, , \,)=(1/\nu)\log\lambda_t$. Note that for this preference structure income elasticities are not necessarily unitary.

We have assumed in (4) that the dynasty utility function for period t is additively separable across dynasty members. The fixed effects tests may also be valid if the dynasty utility function in (4) is not additively separable in utilities, but is given by $U(v_1,\ldots,v_q)$, where v_j is the dynasty's utility from consuming good j and the v_j depend on the sum of separate dynasty household functions of good j, i.e., the form of v_j is given by:

$$v_j = v_j[\sum_{k=0}^{m_t}\Phi(C_{ktj};x_{kt})] \tag{9}$$

If Φ(,) is a power function in C_{ktj}, then the food demand function can be written as:

$$f_{kt} = h(x_{kt},p_{ft}) + \alpha(p_t,\lambda_t,x_t) \tag{10}$$

where f_{kt} is the log of food expenditures, p_{ft} is the price of food at time t, and α(, ,) is common across all dynasty members. If Φ(,) is exponential in C_{ktj}, the f_{kt} in (10) is the level of food expenditure.

D. Testing the Dynasty Model

With (6) as our starting point, our statistical representation is given by:

$$f_{kt} = \beta_t{}'x_{kt} + \alpha_t + u_{kt} \qquad k = 0,1,\ldots,m_t, \tag{11}$$

where α_t is the fixed effect. The error term u_{kt} accommodates measurement error for food consumption and unobserved household characteristics that are unrelated to x_{kt} and α_t.

To implement tests of the dynasty model we have to resolve a few problems. First, we do not observe all the dynasty member households. Let $\{0,1,2,\ldots,n\}$ stand for the set of dynasty members we can observe in the PSID, with $k = 0$ being the parent household and $k = 1,2,\ldots,n$ representing split-offs. The second problem is that this n varies across dynasties and over time. Third, we do not have a specific model of how the marginal utility of dynasty income λ_t is related to observable variables.

To see how these problems can be resolved, we suppress the time subscript in (11), but add the dynasty index i to obtain:

$$f_{ik} = \beta'x_{ik} + \alpha_i + u_{ik} \quad k = 0,1,\ldots,n_i;\ i = 1,2,\ldots,N, \tag{11'}$$

where: N = number of dynasties with at least one split-offs in the sample,
n_i = number of split-offs of dynasty i.

This is exactly the fixed effect model for panel data. In the usual panel data context, k is the time period, while here k is the dynasty member identifier. As such, the standard technique of treating α_i as the fixed effect can be applied here. Since the number of split-offs (n_i) differs across i, the panel is unbalanced. Because the fixed effect controls for household preferences\characteristics and measurement error that are common across all members of the dynasty, the error term u_{ik} consists of household deviations in preferences and measurement error from the dynasty mean.

We can nest this model with the life-cycle alternative by augmenting (11') to include an earnings term:

$$f_{ik} = \beta'x_{ik} + \psi Y_{ik} + \alpha_i + u_{ik} \quad k = 0,1,\ldots,n_i;\ i = 1,2,\ldots,N, \tag{12}$$

where Y_{ik} stands for earnings of member household k of dynasty i. This additional variable Y need not be restricted to earnings. Under the life-cycle hypothesis variables like nonlabor income, assets, and the history of earnings should matter even when the fixed effect is controlled for. As discussed below, if we allow for variable labor supply then nonlabor income, assets, possibly current wage rates, and lagged wage rates can be used to test the altruism model.

We now make the basic identifying assumption that the error term u (which consists of consumption measurement error and unobservable household characteristics unrelated to the observable characteristics x) is uncorrelated with earnings (or our other controls for household k's resources). According to the dynasty model the fixed effect α_i (which is time-specific) should be correlated with earnings Y_{ik} (or our other controls for household k's resources), but the earnings coefficient ψ is, nonetheless, identified to be zero under the null hypothesis of the dynasty model. This is because the fixed effect is removed in the estimation. Note that if some (or all) of the dynasties in the sample are linked, the fixed effect α_i will be numerically the same for each of these dynasties. Hence, our fixed effect test is robust to altruistic linkages across dynasties.

In contrast to the dynasty model that predicts a value of ψ equal to zero, under the life cycle and Keynesian alternatives, ψ should be positive. The reason is that under these alternatives to the dynasty model consumption depends not on the collective resources of one's extended family, but rather simply on one's own resources. Hence, under the alternative models controlling for extended family resources by controlling for the marginal utility of income of the extended family will not control for the resources used in making consumption decisions. Indeed, under the life cycle or Keynesian alternatives the fixed effect α_i has the interpretation of common environmental and genetic components of the unobservable characteristics common to the family rather than the interpretation of a transform of the extended family's marginal utility of income.

F. Does Variable Labor Supply Alter the Test Procedure?

If labor supply is variable the price vector p_t in (6) includes the wage rates of different household members which could differ across member households within the dynasty as well as across members within particular dynasty households. Thus the $\alpha(\, , \,)$ function in (6) can not, in general, be treated as a fixed effect, and we have to restrict preferences further to ensure that the $\alpha(\, , \,)$ function is independent of wage rates which may differ across households. For the case where f_{kt} stands for the log of food expenditure, the CES household utility function given in (7), but expanded to include leisure, provides an example of such preferences;[11] this set of preferences gives rise to Frisch demands given by (6), but with $\alpha(\, , \,)$ dependent only on λ_t. In this case wage rates do enter the Frisch demand system, but only through the function $h(\, , \,)$. One can show (see Blundell 1986) that for the Frisch demands to take this form the utility function must be either homogeneous or additively separable as in (7'). The nonseparable (across dynasty households) preference structure given in (9) is another example of preferences for which f_{kt} is the log of food consumption and $\alpha(\, , \,)$ does not depend on wage rates. In this case and in the case preferences are separable and isoelastic in goods and leisure, $h(\, , \,)$ also does not contain wage rates, and the significance of wage rates in the fixed effect food demand regression constitutes evidence against the joint altruism plus preference structure (9) hypothesis.

For the case that f_{kt} stands for the level of food expenditure, Browning, Deaton, and Irish (1985) provide a complete characterization of preferences in which Frisch demands can be written as the sum of an $\alpha(\, , \,)$ function that does not depend on wage rates plus an $h(\, , \,)$ function that may include wage rates. The constant absolute risk aversion function given in (8), but expanded to include leisure, is one example of such a preference structure. For this particular preference structure cross price effects do not arise in the Frisch demands; hence the Frisch demand is of the form given by (6), but h(,) depends only on demographics and the price of food (and not wage rates), and $\alpha($, $)$ depends only on λ_t. For other preferences described by Browning et. al. the h(,) function, but not the $\alpha($, $)$ may depend on wage rates. For this latter set of preferences in which h(,) may include wage rates the significance of own wage rates in the Frisch food demand does not constitute evidence against altruism. However, for these preferences, one can test altruism by including own nonlabor income and own assets in addition to wage rates.

Since nonlabor income and assets may reflect idiosyncratic tastes that are not fully captured by our demographic controls and, therefore, enter the error term u_{ik} in (12), we also estimate specifications that include both current and lagged wage rates. If preferences are time-separable, past wage rates will not enter h(,) and affect consumption only through the marginal utility of income. Consequently, we can test the altruism model by determining whether the lagged wage rate is significantly greater than zero.

G. Dynamic Tests

A dynamic version of the static fixed effect equation is derived from first differencing equations (12), which yields:

$$\Delta f_{ikt} = \beta' \Delta x_{ikt} + \theta \Delta Y_{ikt} + \Delta\alpha_{it} + \Delta u_{ikt}, \qquad (13)$$

where $\Delta f_{ikt} = f_{ikt} - f_{ikt-1}$. The term $\Delta\alpha_{it}$ equals the change in dynasty i's logarithm of its marginal utility of income, $\alpha_{it+1}-\alpha_{it}$.[12] Hence, $\Delta\alpha_{it}$ is the same across the dynasty households. Assuming exogenous labor supply one can test the dynamic version of the altruism model by including the change in current earnings, ΔY_{ikt}, where $\Delta Y_{ikt} = Y_{ikt} - Y_{ik,t-1}$. If the altruism model holds, the coefficient on this variable will be zero. This is true despite the fact that the income change term is correlated over time with changes in the marginal utility of income. The reason is that the fixed effect technique fully controls for changes in the marginal utility of income. Thus the proposed dynamic test of the dynasty model is simply the fixed effect first-differenced version of the static fixed effect test.[13]

The dynamic test can distinguish the altruism model from the life cycle model with no risk sharing, but does it have power against the life cycle model with selfish risk sharing among extended family members? The answer appears to be no. Take the case of a selfish parent and selfish child who overlap for, in the simplest case, two periods, time t and t+1. Suppose the parent's and child's income at time s ($s=t,t+1$) is Y_{ps} and Y_{ks}, respectively. The parent and child must make consumption decisions at time t knowing Y_{pt} and Y_{kt}, but not knowing Y_{pt+1} and Y_{kt+1}. Let V_p and V_k stand, respectively, for the expected utilities of the parent and child, where $V_p = C_{pt}{}^{1-T}/(1-T) + bE_t C_{pt+1}{}^{1-T}/(1-T)$, $V_k = C_{kt}{}^{1-T}/(1-T) + bE_t C_{kt+1}{}^{1-T}/(1-T)$, E_t is the expectation operator at time t conditional on information at time t, and C_{ps} (C_{ks}) stands for the parent's (child's) consumption at time s. Suppose the selfish parent and child choose to pool their income risk and that they reach an efficient bargain. In this case their behavior can be described as a decision to maximize $\theta_p V_p + (1-\theta_p)V_k$, where the bargaining weight θ_p agreed to by the parent and child will depend on the known values of Y_{pt} and Y_{kt} and the distributions of Y_{pt+1} and Y_{kt+1}. At time s ($s=t,t+1$) this maximization will lead to $\log C_{ps} = (1/T)\log\theta_p - (1/T)\log\lambda_s$ and $\log C_{ks} = (1/T)\log(1-\theta_p) - (1/T)\log\lambda_s$, where λ_s is the Lagrangian multiplier for the time t combined parent-child budget constraint. From these relations we have $\log C_{pt+1} - \log C_{pt} = -(1/T)(\log\lambda_{t+1} - \log\lambda_t)$ and $\log C_{kt+1} - \log C_{kt} = -(1/T)(\log\lambda_{t+1} - \log\lambda_t)$. With the addition of measurement error and taste variations, this is the dynamic fixed effect model specified in (11). Hence, selfish risk sharing, like altruism, can lead to identical changes in the logarithm of the marginal utility of income for extended family members. The dynamic test must, therefore, be viewed as a test of the altruism/life cycle with risk sharing models against the Keynesian/life cycle with no risk sharing models.[14]

H. Using Extended Family Data to Test the Life Cycle Model

The discussion thus far has centered on tests that can lead to the rejection of the altruism model. But the altruism model is not the only interesting null hypothesis. One would, for example, also like to test the pure life cycle model against its alternatives. By pure life cycle model we mean that households neither fully nor partially share resources with their extended family members. This rules out selfish risk sharing as well as altruism. The new data on the extended family provide an opportunity for testing the pure life cycle model's prediction that the household's resources and only the household's resources affect its consumption. The test is simply to determine whether extended family resources affect a household's consumption after one has controlled for the fact that extended family resources help predict the household's permanent income.

Consider again equation (11), but modified, in accordance with the life cycle model's prediction, to permit the marginal utility of income to be household specific:

$$f_{kt} = \beta_t' x_{kt} + \alpha_{kt} + u_{kt} \qquad k = 0, 1, \ldots, m_t, \tag{14}$$

According to the life cycle model α_{kt} in (14) will depend on household specific resources, although this dependence will not, in general, be simple. We proxy this relationship by considering the projection of α_{kt} on the household's current wealth, A_{kt}, its current non-asset income, e_{kt}, and z lags of past non-asset income, $e_{kt-1},\ldots, e_{kt-z}$. Hence, we can write $\alpha_{kt}=\alpha_{kt}(A_{kt},e_{kt},\ldots e_{kt-z})$. Assuming that the elements of the α_{kt} projection capture fully the household's marginal utility of income and that the life cycle model is true, the corresponding dynasty average values of wealth and current and past non-asset income should not enter significantly in the regression equation given in (15):

$$f_{kt}= \beta_t{}'x_{kt}+ \ell_1 A_{kt}+ \ell_2 e_{kt+1}+\ldots+ \ell_{z+1}e_{kt-z}+ \bar{\ell}_1\bar{A}_{kt}+ \bar{\ell}_2\bar{e}_{kt+1}+\ldots+ \bar{\ell}_{z+1}\bar{e}_{kt-z}+ \epsilon_{kt} \tag{15}$$

In addition to incorporating the substitution of the α_{kt} projection into equation (14), equation (15) permits household food consumption to depend on the dynasty average values of A_{kt}, e_{kt}, ..., e_{kt-z}, where the dynasty averages (denoted with an $^{-}$) at time t are taken over all time t members of the dynasty in the data including the own household. We test the life cycle model by considering whether the $\bar{\ell}_i$s (i=1...z+1) are zero.

With additional assumptions one can refine the testing strategy underlying equation (15). Assume that utility is quadratic and that households face only earnings uncertainty. Then α_{kt} can be written as the sum of the present expected value of human wealth plus nonhuman wealth, where f_{kt} now stands for the level of food consumption. Let us further assume that the household's labor earnings e_{kt} equals the sum of a permanent component, e^p_{kt} which evolves as a random walk, and an i.i.d. transitory component, $\tilde{e}_{kt}$, i.e.

$$e_{kt} = e^p_{kt} + \tilde{e}_{kt} \tag{16}$$

Assume that the present expected value of human wealth may be approximated by e^p_{kt} divided by the interest rate plus $\tilde{e}_{kt}$. Together these assumptions imply the following specification of (14):

$$f_{kt} = \beta_t{}' x_{kt} + \delta_1 A_{kt} + \delta_2 e^p_{kt} + \delta_1 \tilde{e}_{kt}+ \epsilon_{kt} \tag{17}$$

The econometric problem in estimating (17) is that we don't have independent measures of the permanent and transitory components of e_{kt}. Substituting into (17) for e^P_{kt} from (16) and allowing for the possibility that the dynasty average values of A_{kt}, $\bar{A}_{kt}$, and e_{kt}, $\bar{e}_{kt}$, enter the equation yields:

$$f_{kt} = \beta_t' x_{kt} + \delta_1 A_{kt} + \delta_2 e_{kt} + \bar{\delta}_1 \bar{A}_{kt} + \bar{\delta}_2 \bar{e}_{kt} + \epsilon'_{kt} \tag{17'}$$

where, under the life cycle hypothesis, the error term $\epsilon'_{kt} = \epsilon_{kt} + (\delta_1 - \delta_2)\tilde{e}_{kt}$. Since e_{kt} is correlated with ϵ'_{kt}, we estimate (17') using instrumental variables. Our test of the life cycle model is that $\bar{\delta}_1$ and $\bar{\delta}_2$ equal zero.

Unfortunately the PSID has data on assets and liabilities only for 1984. Hence, we conduct the test in equation (15) and the test in equation (17') for 1984. In order to use data from the other years we again estimate (15), but use, instead of the non-asset income and wealth variables, the following variables: current and lagged values of own and dynasty average total income and current values of own and dynasty average home equity. Equation (17') can also be estimated in the absence of wealth data by using own and dynasty average current total income in the place of current own and dynasty average non-asset income and current wealth and instrumenting own and dynasty average current total income. This formulation is simply Friedman's permanent income hypothesis augmented to allow the average permanent income of the dynasty to affect household consumption. In conducting our tests of (15) and (17') we measure food consumption both in the levels and in the logs.

A final test that we conduct of the life cycle model is to regress the change in the logarithm of food consumption against changes in the log of household's total income (head's wage rate) and changes in the average value of dynasty total income (heads' wage rates). Considering whether changes in relatives' resources affects a household's consumption may be a more powerful way of testing the life cycle model than tests based on the level of consumption. The reason is that even if the life cycle model is true dynasty resource variables, which are correlated with household resource variables, will enter into equation (15) if we have not controlled fully for the household's marginal utility of income. In contrast, while dynasty resources may help predict the level of a household's resources, changes in dynasty resources are less likely to help predict changes in a household's resource position.

III. Data and Sample Selection

A. The PSID

The PSID began in 1968 with a sample of over 4,802 households. The PSID has reinterviewed the heads and spouses of the initial sample each year since 1968. In the case of divorce or separation, the PSID has followed both the head and spouse into their new households. Such new households that are added to the PSID are referred to as "split-offs". In addition to split-offs from divorce or separation, there are child split-offs that arise whenever one of the children of the 1968 respondents, who was living with the respondent in 1968 and was 18 or younger in 1968, leaves the respondents' household to form (or become a spouse in) his or her own household. The same set of information that has been collected for the parent households has also been collected for all split-offs. Hence, the PSID provides a matched data set of parents together with at least a subset of their independent children.

Our data come from the 1985 PSID, specifically the families and individuals tape that does not include households that dropped out of the PSID prior to 1985. The 1985 tape contains data collected for 1984 as well as for all previous years. We first identify all individuals in the 1985 PSID who are listed, in 1968, as children. We then identify the 1968 parents of these children. These parents are referred to as the earliest parents, since they may or may not be the natural parents. Our second step is to follow, starting in 1968, each identified child and determine whether and when he or she formed an independent household, by which we mean became a head or spouse in a household different from that of the child's earliest parents. The third step involves collecting data on consumption, labor supply, income, etc. for such independent children in each year that they are independent together with contemporaneous data for the households that include their earliest parents. If there is only one earliest parent or if both earliest parents are still living together, we collect data on the single household containing such earliest parent(s). If there are two earliest parents, but they are no longer living together, we collect contemporaneous data on the two households containing each of the two earliest parents, including data on possible step-parents. Hence, in a given year there will be data for one or two earliest parent households for each independent child. Of course, some of these children are siblings, hence, in forming the data set we include codes that permit us to link the data on each of the independent children households to the data for the other independent children households as well as to the data on the household(s) of their earliest parent(s). In order to run the fixed effect model, we need at least two observations on extended family members in a given year. Hence, if data are available on an independent child who has no independent siblings and who has no parents (because of death, missing data, or attrition from the sample), we exclude the observation from the analysis. We also require that each dynasty in the regression samples contain at least one parent and one child.

Since there are new split-offs every year, the number of independent child household observations in the data increases over time. The number of earliest parent household observations also changes through time because of divorce, remarriage, death, and sample attrition. Table 1 reports for each year the number of earliest parent households as well as the number of independent child households used in our analysis after we have applied the sample selection rules described below. The Table also distinguishes the number of independent children observations by the number with one or two earliest parent households. Finally, it distinguishes the number of earliest parent households by the number of associated independent child households. The Table as well as our empirical work begins with the 1976 data; prior to 1976 there are relatively few observations on independent children and information needed to construct our income measure is missing.

The number of independent children increases from 713 in 1976 to 2178 in 1985. The corresponding figures for earliest parents are 544 in 1976 and 1171 in 1985. To understand the Table, take 1985 as an example. In that year 764 of the 2178 independent children have only one earliest parent, while the rest (1293 + 121) have two earliest parents. Of those children with two earliest parents in the 1985 PSID, 121 have two earliest parents who are living in separate households in 1985. Next consider the 1171 earliest parents listed in the Table for 1985. A total of 531 of these parents have only one independent child in the data set; 344 have two children in the data set, and the rest, 296, have three or more children in the data set.

One problem, not yet mentioned, in using assets to test altruistic linkages is that the PSID has, so far, included a complete list of assets and liabilities only for the 1984 wave. Our 1984 wealth measure uses the 1984 PSID data on holdings of stocks, bonds, real estate, vehicles, business and farm assets, checking and saving accounts,house value, and the value of outstanding mortgages. For years other than 1984, when relatively complete asset data are not available, we can use information on the house value less the remaining mortgage. We also use data on nonlabor income which includes income from assets and income from exogenous sources, such as Social Security benefits.

B. Sample Selection

The PSID's survey questions about income and consumption for a particular year refer to income earned in the previous year and consumption expenditures at the time of the survey (typically March or April). Since children who are first recorded as independent in year t are asked about income and consumption during year t-1, some or all of which may have been spent with their earliest parent(s), we exclude from the analysis data from the year in which a child is first reported as independent. For the same reason data are excluded on parents who split off by divorcing or separating in the first year the parents are reported as split-offs. Another requirement for parents and children to be included in the sample is that the parents and children be either a head or a spouse. In addition we exclude household observations in which either reported annual income is less than $500 or annual consumption is less than $250, where both numbers refer to 1967 dollars. We include a dynasty in a given year only if we had valid data for at least one parent household and at least one child household. Finally we require that the age of parent is greater than 38 and the age of each child is greater than 24. Table 2 reports, for both child and parent households, means and standard deviations of many of the variables used in this analysis.

IV. Results of Static Tests of Altruism

A.Static Tests Based on Current Income

Table 3 reports the income coefficients from the static fixed effect test for both logarithm and level specifications. Income is defined here as total family income less transfers from family members living outside the household received by the household head. Hence, the income variable consists of labor come plus nonlabor income, where the latter variable includes asset income plus government transfers, but excludes private transfers. The demographic controls in these and subsequent static regressions are the number of males and females in the household in eleven age brackets, [15] dummies for the household's race, dummies for the household's marital status, a fourth order polynomial in the age of the head, a dummy for the sex of the head, a dummy for whether the household is a child or parent household,[16] the square of the number of children, the number of adults squared, and the square of the household's size.

The standard errors in the regressions for particular years are White (1984) standards errors. Specifically, they allow for a dynasty-specific variance-covariance matrices, but assume independence of errors across different dynasties. The pooled (over time) regressions also allow for an arbitrary dynasty-specific variance-covariance matrix, including an arbitrary covariance pattern of errors across years. The standard errors in all subsequent Tables are computed in the same manner.

In contrast to the altruism model's prediction of zero income coefficients when one controls for the fixed effects, all 20 of the annual income coefficients are positive and 19 of 20 are highly significant. From the logarithmic specification it is immediate that the income elasticities are economically large and reasonable. In the Table we also report a pooled equation that includes separate fixed effects for each dynasty for each year, but restricts the coefficients on household income and demographics to be the same across years. The coefficients on income in both the logarithmic and level specifications are highly significant. Note that in addition to being significant, the income coefficients in Table 3 are quite large when compared with the income coefficients that arise if one omits the fixed effects. In the case of the log specification the fixed effect coefficient is 84 percent as large as the non-fixed effect coefficient; in the level specification the fixed effect coefficient is 75 percent as large.

While the income coefficients are larger when the fixed effects are omitted, one would expect such an outcome if the life cycle model were true and current income were not a perfect measure of permanent income. To see this suppose each dynasty member had an identical permanent income. In this case the fixed effects would control perfectly for the household's permanent income and, given that one has controlled for permanent income, the coefficient on current income should be zero. Now clearly, the permanent income of different dynasty members will differ; but if they are correlated, which is surely the case, the force of the argument should go through.[17] Note that the finding of smaller income coefficients in the fixed effects estimation is predicted by the life cycle model, but not the Keynesian model. According to the Keynesian model current income, rather than permanent income, determines current consumption and the fixed effects should have no influence on the current income coefficient (assuming current income is accurately measured).

The strong rejection of the altruism model found in Table 3 is robust to the definition of food consumption. Tables 4 and 5 report the income coefficients for food at home and food away from home. A total of 37 of 40 of the income coefficients in the fixed effect estimation in the two Tables are significant. The income coefficent in the four pooled regressions are also highly significant.

The rejection of altruism is also robust to the temporal pairing of the consumption and income data. In the base case we pair year t's response to the consumption question with year t's response to the income question.

However, the year t income question refers to income in the previous year, while the year t consumption question refers to the respondent's household's usual weekly consumption expenditure (although the data are reported on an annual basis). It may be that the response to the consumption question refers to consumption in the current year. In Table 6 we regress year t-1's consumption against year t's income. The results are quite similar to those in Table 3.

One response to these findings is that while the altruism model may not hold for all parent and child pairs, it may hold for a subset of households such as those that engage in transfers with one another. Unfortunately, there are relatively few observations across all the years in which the household head reports receiving transfers from other family members. A larger sample that might be likely to satisfy the predictions of altruism and also avoid the problem discussed in Section II of switches in transfer regimes is the sample of parents with incomes above the median for parents together with that subset of their children whose incomes are below the median for children. Table 7 reports the results for this sample of rich parents and poor children. The results also reject very strongly the altruism model.

B. Static Tests Based on Nonlabor Income, Wage Rates, and Assets

Table 8 repeats the fixed effect tests, but uses nonlabor income rather than total income. We restrict the sample to households with $50 or more of nonlabor income. The results are quite similar to those based on total income. In the levels 9 of 10 income coefficients are significant; in the logs 7 of 10 are significant. When we pool the data allowing different fixed effects for each dynasty for each year the income coefficient on nonlabor income for the regression in levels is .014 with a t statistic of 1.944; in the logs it is .028 with a t of 5.14. The corresponding non-fixed effects pooled coefficients are .019 (t=2.07) and .041 (t=7.86).

Tables 9 and 10 include the wages of the head and spouse in addition to the household's nonlabor income. Table 9 provides results for the level regression, and Table 10 provides results for the logarithmic regression. For the level regression wage rates and nonlabor income are entered in their levels, while in the logarithmic regression these variables are entered in their logs. An additional sample selection rule imposed here is that wage rates exceed $.50 per hour in 1967 dollars. The regression sample here includes wives with reported wages less than $.50. To control for such wives, many of whom simply don't work, we included a dummy.

The findings in Tables 9 and 10 add to the case against the altruism model. In the fixed effects regressions many of the pooled and annual wage rate coefficients are significant, which, depending on the form of preferences, may itself constitute evidence against the altruism model. But many of the nonlabor income coefficients are also significant. In the annual levels regressions 6 of the 10 nonlabor income coefficients in the fixed effects test are significant; in the annual log regressions 8 of the 10 coefficients are significant. The nonlabor income coefficients in the pooled regressions are highly significant in both the levels and the logs. In addition the pooled income coefficients are very close in magnitude (the level coefficients are identical to three digits) for both the fixed effects and nonfixed effects regressions. We also estimated the models of Tables 9 and 10 but excluded nonworking wives. The pooled regression results are quite similar.

Next we estimated pooled regressions for a sample defined like that of Tables 9 and 10 (including wives with wages less than $.50) except that home equity rather than nonlabor income was used to test the altruism model. In these regressions we required that households have $1000 or more of home equity to be included in the sample. In the fixed effects regressions (sample size = 6257) the levels coefficient on home equity is .004 (t=1.97), and the log coefficient is .042 (t=3.39). The corresponding non-fixed effects coefficients are .008 (t=5.15) and .075 (7.43). Again, contrary to the altruism model's prediction, the fixed effects coefficients are nontrivial compared with the non-fixed effects coefficients.

Finally, Tables 11 and 12 use the lagged wage of the household head to test the altruism model. The regressions also include current wages of the household head and spouse. Recall that if the dynasty's utility function is time separable, current wages may enter the Frisch demands, but lagged wages will not. The advantage of testing altuism with lagged wages is that, compared with nonlabor income, they are less likely to be correlated with that component of the error term that reflects household preferences not captured by our demographic controls. In the two Tables 10 of 20 lagged wage coefficients are significant. In addition, the lagged wage coefficients are highly significant in the pooled regressions. While the lagged wage coefficients are larger if one exclude the fixed effects, the lagged wage coefficients in the fixed effects regressions are, nevertheless, quite substantial.

V. Dynamic Tests

The results from estimating the basic model in first differences are given in Table 13. While only 6 of the 20 income change coefficients are significant when one runs the model with fixed effects, 19 of these coefficients are positive. In addition, the magnitudes of the income change coefficients are similar whether one includes or excludes the fixed effects. If one pools the first differenced data and assumes that the income change coefficient is the same for each year (but allows the fixed effects to differ by year), the income change coefficient is .002 in the levels with a t statistic of 1.52; in the logs the income change coefficient is .063 with a t statistic of 5.01. The corresponding coefficients without fixed effects are .002 (t=1.29) and .074 (t=7.11). According to these pooled regressions the effect of changes in own income on household consumption appear to be equally large whether or not one controls for changes in the resource positions of the household's relatives.

On balance then the dynamic results also reject the altruism hypothesis. The fact that the dynamic results are somewhat weaker than the static results may reflect the problem of greater noise relative to signal associated with first differencing. Alternatively, it may reflect risk sharing among selfish life cycle household members within the extended family.

VI. Can One Reject the Life Cycle Model?

Table 14 reports the results of estimating equation (15). Recall, that this equation relates food consumption to current and two lagged values of own and dynasty non-asset income and current own and dynasty values of wealth. The results in both the logs and the levels (columns 1 and 2) suggest a role of dynasty resources in influencing household consumption. In the case of the logs, the sum of the dynasty non-asset income coefficients is about two fifths the corresponding sum for household non-asset income. The dynasty asset coefficient, although insignificant, is 38 percent of the household asset coefficient.

Table 14 also contains the results for 1984 from estimating equation (17′) by instrumental variables. Recall that (17′) arises from assuming that utility is quadratic and that non-asset income consists of a random walk plus a transitory component. In this structural model consumption is determined by current wealth and the instrumented value of current income. The instrumental variables we use for current (1984) non-asset incomes of the household and dynasty are the demographic controls, household and dynasty wealth, and the separate means, across years, of non-asset income for the household and for all dynasty households. In forming these means we exclude data for 1984.

The IV results suggest a somewhat smaller role of dynasty resources than the previous reduced form results. In the log and level regressions the point estimates of the dynasty current non-asset income coefficient are about one fifth that of the household; however, the dynasty wealth coefficients are large compared to the household wealth coefficients.

The findings of Table 14 are reinforced by those in Table 15. Table 15 is another reduced form version of (15), but one that uses data for all past years. Since wealth is not available, the regressions of Table 15 include home equity as well as current and two lags of non-asset income. In the pooled log results the sum of the dynasty income coefficients are almost 30 percent of the corresponding sum of household income coefficients. In addition, the dynasty home equity coefficient is three quarters the size of the household's home equity coefficient and is significant. In the levels regression the sum of dynasty income coefficients is almost half the corresponding household sum, and the dynasty home equity coefficient is just over one half the household equity coefficient.

Table 16 returns to the structural permanent income formulation (equation 17'), but uses the data for all the years. Since wealth data is available only for 1984, we used total income and instrumented total income with the mean (over past and future years) of total income. The IV coefficients on dynasty income are smaller than the IV coefficient on own income. In the case of the pooled log (levels) IV regression the coefficient on dynasty income is not statistically significant, and it is 15 (4) times smaller than the household total income coefficient.[18] Note that, as predicted, the difference between the own income and dynasty coefficients is larger for the IV estimates than the OLS estimates.

Table 17 considers how changes in household and dynasty total income and wage rates (of heads) influence changes in the log of household food consumption. The results here are slightly more supportive of the strict life cycle model. Consider first one year changes in consumption. Here, the change in dynasty income has an insignificant influence on the change in consumption, although the magnitude of the point estimate is not trivial. In the case of two year changes the two year change in dynasty income has a zero (to two decimal places) effect on the two year change in household consumption. The wage rate changes of the dynasty are uniformly insignificant, even after we instrument the wage measure to account for measurement error in the wage rate.

VII. Summary and Conclusion

In recent years the infinite horizon altruism model has played an important role in theoretical analysis and policy debate. This is surprising given the lack of direct micro empirical support for the model. The long delay in testing the model with micro data reflects the paucity of data on the extended family. Fortunately, the ongoing PSID now provides sufficient extended family data to test the operative altruism model. The key prediction of the altruism model is that altruistically-linked family members fully share resources in the sense that the division of their total consumption should be independent of the division of their collective resources.

This paper directly tests whether the distribution of resources affects the distribution of consumption among parents and children. We find overwhelming evidence that it does. Our test procedure, which is based on Frisch demand functions, is attractive because it does not require either solving the extended family's dynamic programming problem nor knowing the precise level of extended family resources nor knowing the boundaries of the altruistically linked extended family. According to the altruism model all extended family members will have the same marginal utility of income, and their consumption demands can be written as Frisch demand functions of this variable and relative prices. Once one controls (through the fixed effect technique) for the extended family's marginal utility of income, the resource position of particular extended family members should not influence the consumption of those members.

In our tests we use total income, nonlabor income, home equity, and wage rates as proxies for the resource position of particular extended family members. We find that each of these proxies is a significant variable in explaining the consumption of extended family members even after one has controlled for the extended family's marginal utility of income. The strong rejection of the altruism model holds up for the subset of the sample consisting of rich parents and poor children. It also holds up whether or not labor supply is viewed as endogenous and whether or not the tests are run in levels or first differences.

In addition to showing that own resources matter given extended family resources, we test the life cycle model by asking whether only own resources matter, i.e., whether the resources of extended family members have no affect on a household's consumption. Our results suggest that extended family member resources have, at most, a modest effect on marginal household consumption decisions after one has controlled for the fact that extended family resources help predict a household's own permanent income.

Despite our findings, we do believe that significant altruistically-motivated transfers occur in the U.S., particularly among the wealthy who are underrepresented in the PSID. Our findings suggest, however, that very few, if any, U.S. households are altruistically linked at the margin in the sense that redistribution between the donor and recipient will be neutralized. The altruistically-motivated transfers that one observes in the U.S. may come in the form of less than fully efficient educational support to liquidity constrained children (as described by Becker (1974) and Drazen (1978)), in-kind transfers by paternalistic altruists (as described by Pollak (1988)), incentive-oriented transfers by altruistic parents concerned about free-riding children (as described by Kotlikoff and Razin (1988)), and end of life transfers by parents concerned that children will sqaunder what they receive at an early age and ask for more (as described by Kotlikoff, 1987, Bruce and Waldman, 1988, 1989, Lindbeck and Weibull, 1988).

While liquidity-constrained, paternalistic, and strategically-constrained altruism may abound, our findings nevertheless indicate that changing the distribution of resources within the extended family significantly changes its distribution of consumption. Given this finding, the notion that an extended family, let alone an entire country, can be modeled as a single representative consumer with an infinite horizon seems highly questionable.

Table 1 Enumeration of Independent Child and Earliest Parent Household Observations

	Independent Children				Earliest Parent(s)			
			2 Parents					
Year	Total	1 Parent	Married	Div./Sep.	Total	1 Child	2 Child	3+Child
1976	713	314	386	13	544	396	121	27
1977	775	315	447	13	576	411	129	36
1978	971	387	563	21	692	462	173	57
1979	1201	481	685	35	792	484	211	97
1980	1384	524	816	44	883	508	258	117
1981	1550	591	900	59	945	515	280	150
1982	1731	635	1017	79	1019	522	307	190
1983	1892	699	1114	79	1068	512	332	224
1984	2043	725	1219	99	1129	530	341	258
1985	2178	764	1293	121	1171	531	344	296
Total	14438	5435	8440	563	8819	4871	2496	1452

Table 2 A Description of the Data

Variable	Child households Mean	Child households Standard Deviation	Parent Households Mean	Parent Households Standard Deviation	Total Mean	Total Standard Deviation
Household Income	8608	5599	9297	9740	8869	7452
Dynasty Income	7871	3965	9103	7752	8336	4227
Log Household Income	8.86	.67	8.82	.81	8.84	.73
Dynasty Log Inc.	8.74	.57	8.79	.76	8.76	.52
Household Cons.	1234	691	1326	751	1269	716
Log Household Cons.	6.99	.51	7.04	.55	7.01	.53
Household Food Away From Home	259	279	214	307	242	291
Household Food At Home	975	610	1112	633	1027	622
<u>Males:</u>						
aged 0–5	.336	.579	.031	.198	.221	.495
aged 5–10	.205	.464	.042	.212	.143	.396
aged 10–15	.084	.321	.114	.373	.095	.342
aged 15–20	.017	.155	.229	.520	.098	.357
aged 20–25	.120	.327	.165	.422	.137	.366
aged 25–30	.361	.481	.050	.235	.243	.433
aged 30–40	.312	.464	.023	.160	.202	.404
aged 40–50	.020	.140	.131	.341	.062	.243
aged 50–60	.003	.061	.345	.475	.133	.339
aged 60–70	.001	.020	.185	.388	.070	.256
aged 70+	.001	.031	.038	.194	.015	.123

Table 2 Continued

Variable	Child households Mean	Child households Standard Deviation	Parent Households Mean	Parent Households Standard Deviation	Total Mean	Total Standard Deviation
Females:						
aged 0–5	.306	.556	.034	.199	.203	.473
aged 5–10	.188	.445	.037	.201	.131	.379
aged 10–15	.072	.289	.112	.374	.087	.324
aged 15–20	.023	.169	.207	.497	.093	.345
aged 20–25	.209	.408	.103	.338	.169	.386
aged 25–30	.393	.489	.026	.171	.254	.437
aged 30–40	.235	.425	.033	.183	.158	.367
aged 40–50	.009	.093	.293	.457	.116	.322
aged 50–60	.002	.045	.441	.499	.168	.375
aged 60–70	.002	.045	.189	.391	.073	.259
aged 70+	.002	.048	.044	.206	.018	.134
Race, Marital Status, Sex, and Age of Household Head:						
Black	.310	.463	.315	.464	.312	.463
Asian	.002	.049	.002	.042	.002	.047
American	.002	.053	.003	.057	.003	.054
Other	.005	.070	.004	.065	.005	.068
married	.699	.458	.683	.465	.693	.461
divorced	.074	.262	.106	.307	.086	.280
Female	.503	.500	.362	.480	.449	.497
age of head	29.1	3.96	56.7	7.71	39.5	14.5

Table 3 Static Test on Basic Sample

Year	Households	Fixed Effect Log	Fixed Effect Level	No Fixed Effect Log	No Fixed Effect Level
76	1257	0.169	0.025	0.190	0.030
		(6.240)	(5.991)	(8.776)	(7.506)
77	1351	0.235	0.032	0.254	0.035
		(7.372)	(6.920)	(11.205)	(7.592)
78	1663	0.229	0.028	0.286	0.035
		(8.997)	(8.449)	(15.124)	(10.802)
79	1993	0.259	0.040	0.296	0.046
		(10.383)	(8.605)	(15.743)	(11.191)
80	2267	0.223	0.032	0.291	0.040
		(9.885)	(8.722)	(15.383)	(10.451)
81	2495	0.249	0.008	0.292	0.011
		(10.847)	(1.440)	(16.794)	(1.519)
82	2750	0.248	0.029	0.286	0.034
		(12.798)	(7.512)	(18.368)	(7.623)
83	2960	0.258	0.030	0.290	0.036
		(13.587)	(6.474)	(19.948)	(8.046)
84	3172	0.222	0.026	0.293	0.034
		(12.678)	(7.564)	(20.913)	(8.432)
85	3349	0.242	0.019	0.288	0.027
		(12.802)	(4.017)	(19.595)	(4.471)
Pooled	23257	0.240	0.021	0.286	0.028
		(23.289)	(4.163)	(33.067)	(5.083)

t-statistics in parentheses

Table 4
Static Test Food at Home

	Households		Fixed Effect		No Fixed Effect	
Year	Log Sample	Level Sample	Log	Level	Log	Level
76	1253	1257	0.097	0.011	0.100	0.012
			(3.358)	(3.119)	(4.795)	(4.131)
77	1347	1351	0.163	0.017	0.152	0.017
			(5.055)	(4.520)	(6.611)	(5.142)
78	1659	1663	0.133	0.012	0.192	0.017
			(4.394)	(4.232)	(9.184)	(6.635)
79	1983	1993	0.182	0.019	0.211	0.023
			(6.585)	(5.897)	(9.950)	(8.189)
80	2259	2267	0.161	0.016	0.206	0.021
			(6.017)	(5.616)	(10.150)	(6.653)
81	2487	2495	0.176	0.005	0.213	0.006
			(7.056)	(1.539)	(11.679)	(1.535)
82	2736	2750	0.181	0.014	0.216	0.017
			(8.819)	(5.626)	(13.181)	(6.034)
83	2944	2960	0.186	0.018	0.213	0.021
			(8.999)	(4.713)	(14.075)	(6.136)
84	3152	3172	0.152	0.013	0.204	0.018
			(8.287)	(6.060)	(14.275)	(7.876)
85	3328	3349	0.151	0.007	0.185	0.012
			(7.327)	(1.811)	(12.107)	(2.694)
Pooled	23148	23257	0.165	0.010	0.201	0.014
			(14.940)	(3.732)	(22.868)	(4.573)

t-statistics in parentheses

Table 5
Food Away From Home

	Households		Fixed Effect		No Fixed Effect	
Year	Log Sample	Level Sample	Log	Level	Log	Level
76	961	1257	0.254	0.014	0.466	0.018
			(3.775)	(6.454)	(7.925)	(8.418)
77	1105	1351	0.339	0.015	0.521	0.018
			(5.037)	(5.569)	(9.087)	(6.552)
78	1388	1663	0.454	0.016	0.550	0.018
			(8.317)	(9.169)	(11.685)	(11.626)
79	1671	1993	0.431	0.020	0.537	0.022
			(7.688)	(6.929)	(12.159)	(8.547)
80	1947	2267	0.379	0.016	0.525	0.019
			(7.942)	(9.055)	(13.088)	(11.576)
81	2121	2495	0.429	0.003	0.498	0.005
			(8.974)	(1.276)	(12.556)	(1.486)
82	2348	2750	0.364	0.015	0.466	0.016
			(8.496)	(6.035)	(12.127)	(6.714)
83	2539	2960	0.359	0.012	0.466	0.016
			(9.315)	(7.245)	(13.944)	(10.364)
84	2723	3172	0.363	0.013	0.481	0.016
			(10.140)	(7.538)	(15.691)	(8.098)
85	2920	3349	0.397	0.012	0.501	0.015
			(9.998)	(8.181)	(15.309)	(8.792)
Pooled	19723	23257	0.383	0.010	0.497	0.013
			(17.545)	(4.085)	(24.156)	(5.268)

t-statistics in parentheses

Table 6
Consumption Lagged One Year

Year	Households	Fixed Effect Log	Fixed Effect Level	No Fixed Effect Log	No Fixed Effect Level
77	1333	0.174 (6.544)	0.025 (7.141)	0.203 (9.895)	0.027 (7.920)
78	1541	0.216 (8.359)	0.030 (6.338)	0.254 (12.166)	0.035 (8.233)
79	1827	0.241 (9.709)	0.033 (9.942)	0.296 (15.120)	0.039 (12.192)
80	2162	0.264 (10.969)	0.033 (8.162)	0.289 (15.270)	0.039 (9.609)
81	2317	0.253 (10.414)	0.008 (1.471)	0.278 (15.088)	0.011 (1.647)
82	2488	0.233 (11.202)	0.028 (7.563)	0.275 (16.114)	0.032 (7.852)
83	2793	0.260 (13.712)	0.030 (8.775)	0.283 (19.260)	0.035 (10.386)
84	2983	0.240 (12.083)	0.023 (5.504)	0.269 (18.279)	0.029 (7.251)
85	3121	0.240 (13.427)	0.019 (4.705)	0.295 (20.360)	0.025 (4.495)
Pooled	20565	0.242 (22.802)	0.020 (4.016)	0.279 (31.231)	0.026 (4.954)

t-statistics in parentheses

Table 7
Rich Parent - Poor Kid

Year	Households	Fixed Effect Log	Fixed Effect Level	No Fixed Effect Log	No Fixed Effect Level
76	376	0.155	0.030	0.155	0.036
		(2.473)	(1.559)	(3.230)	(2.266)
77	386	0.235	0.077	0.231	0.077
		(3.767)	(4.019)	(4.877)	(5.414)
78	479	0.294	0.071	0.317	0.083
		(6.038)	(5.076)	(7.954)	(8.019)
79	568	0.214	0.037	0.236	0.050
		(4.085)	(2.560)	(6.241)	(4.708)
80	658	0.169	0.058	0.223	0.063
		(3.212)	(4.179)	(5.308)	(6.123)
81	726	0.196	0.047	0.227	0.056
		(3.535)	(3.079)	(5.607)	(4.704)
82	851	0.298	0.071	0.256	0.058
		(7.089)	(5.753)	(7.373)	(6.360)
83	946	0.245	0.057	0.243	0.058
		(6.027)	(4.632)	(7.617)	(6.188)
84	1029	0.183	0.047	0.259	0.068
		(4.966)	(5.085)	(8.558)	(7.093)
85	1017	0.274	0.067	0.269	0.068
		(8.050)	(5.033)	(9.580)	(6.912)
Pooled	7036	0.228	0.057	0.246	0.062
		(12.567)	(10.888)	(17.457)	(14.885)

t-statistics in parentheses

Table 8
Static Tests based on Non-Labor Income

Year	Households	Fixed Effect Log	Fixed Effect Level	No Fixed Effect Log	No Fixed Effect Level
76	584	0.033 (2.192)	0.030 (3.020)	0.042 (2.998)	0.040 (3.287)
77	616	0.047 (2.652)	0.029 (2.598)	0.043 (2.961)	0.026 (1.969)
78	821	0.014 (0.927)	0.019 (2.213)	0.023 (1.826)	0.019 (2.003)
79	955	0.039 (2.647)	0.041 (3.735)	0.036 (2.939)	0.042 (3.637)
80	1180	0.032 (2.305)	0.036 (4.956)	0.044 (3.859)	0.048 (5.528)
81	1371	0.035 (2.630)	0.004 (1.188)	0.048 (4.530)	0.005 (1.073)
82	1528	0.031 (2.843)	0.022 (3.292)	0.035 (3.910)	0.021 (2.807)
83	1705	0.023 (2.058)	0.026 (2.550)	0.035 (3.652)	0.040 (6.925)
84	1822	0.015 (1.372)	0.022 (2.983)	0.041 (4.260)	0.033 (3.467)
85	1952	0.021 (1.798)	0.032 (3.506)	0.036 (3.849)	0.044 (5.379)
Pooled	12534	0.028 (5.144)	0.014 (1.944)	0.041 (7.865)	0.019 (2.068)

t-statistics in parentheses

Table 9
Including Wage Rates - Results in Levels
Dummy for Nonworking Wife

		Fixed Effect			No Fixed Effect		
Year	Households	Head's Wage	Spouse's Wage	Nonlabor Income	Head's Wage	Spouse's Wage	Nonlabor Income
76	389	0.204	-0.057	0.017	0.283	0.392	0.038
		(1.219)	(-0.247)	(1.524)	(1.837)	(1.389)	(2.525)
77	465	0.589	0.194	0.025	0.529	0.238	0.025
		(3.715)	(1.868)	(2.999)	(3.425)	(1.197)	(2.243)
78	622	0.491	-0.475	0.013	0.620	0.519	0.009
		(4.427)	(-2.153)	(1.568)	(5.307)	(2.890)	(1.118)
79	690	0.139	0.190	0.041	0.364	0.613	0.044
		(1.474)	(0.624)	(3.088)	(2.303)	(2.403)	(3.289)
80	851	0.155	0.361	0.038	0.256	0.291	0.051
		(1.510)	(1.686)	(4.627)	(1.960)	(1.250)	(5.313)
81	931	0.252	-0.322	0.005	0.558	-0.056	0.003
		(1.411)	(-1.264)	(1.348)	(4.897)	(-0.205)	(0.710)
82	981	0.340	0.911	0.017	0.466	0.987	0.014
		(2.705)	(3.686)	(3.244)	(4.364)	(4.430)	(2.481)
83	1039	0.647	0.588	0.032	0.669	0.636	0.037
		(5.504)	(2.431)	(4.016)	(5.314)	(3.030)	(5.079)
84	1109	0.611	0.398	0.012	0.667	0.526	0.020
		(5.109)	(2.647)	(1.852)	(4.926)	(3.694)	(2.109)
85	1160	0.208	0.044	0.031	0.620	0.116	0.034
		(1.133)	(0.155)	(2.484)	(4.635)	(0.538)	(2.735)
Pooled	8237	0.379	0.180	0.012	0.549	0.339	0.012
		(5.540)	(1.871)	(1.683)	(7.491)	(3.669)	(1.419)

t-statistics in parentheses

Table 10
Including Wage Rates - Results in Logs
Dummy for Nonworking Wife

Year	Households	Fixed Effect: Head's Wage	Fixed Effect: Spouse's Wage	Fixed Effect: Nonlabor Income	No Fixed Effect: Head's Wage	No Fixed Effect: Spouse's Wage	No Fixed Effect: Nonlabor Income
76	389	0.053	-0.025	0.028	0.099	0.084	0.052
		(1.185)	(-0.452)	(1.699)	(2.597)	(1.744)	(3.321)
77	465	0.208	0.032	0.043	0.188	0.071	0.048
		(4.203)	(0.711)	(2.220)	(5.047)	(1.570)	(3.076)
78	622	0.180	-0.081	0.025	0.196	0.095	0.031
		(5.674)	(-1.722)	(1.664)	(7.337)	(2.280)	(2.512)
79	690	0.089	0.032	0.043	0.164	0.122	0.046
		(2.462)	(0.522)	(2.917)	(5.933)	(2.853)	(3.728)
80	851	0.047	0.122	0.038	0.149	0.122	0.058
		(1.546)	(2.903)	(2.439)	(5.144)	(3.106)	(4.666)
81	931	0.102	0.019	0.059	0.174	0.042	0.062
		(2.862)	(0.387)	(3.902)	(6.423)	(1.062)	(5.217)
82	981	0.159	0.152	0.031	0.169	0.135	0.039
		(5.144)	(3.724)	(2.531)	(7.303)	(4.377)	(4.031)
83	1039	0.197	0.107	0.026	0.203	0.124	0.035
		(6.123)	(2.652)	(2.039)	(8.064)	(3.829)	(3.252)
84	1109	0.175	0.131	0.008	0.194	0.166	0.035
		(6.406)	(3.326)	(0.684)	(8.267)	(5.889)	(3.215)
85	1160	0.099	0.066	0.018	0.163	0.087	0.039
		(3.077)	(1.396)	(1.229)	(6.289)	(2.420)	(3.451)
Pooled	8237	0.136	0.071	0.030	0.178	0.107	0.047
		(10.255)	(3.838)	(5.252)	(14.183)	(6.867)	(8.967)

t-statistics in parentheses

Table II
Including Current and Lagged Wage Rates - Results in Levels
Dummy for Nonworking Wife

Year	Households	Fixed Effect: Head's Wage	Fixed Effect: Spouse's Wage	Fixed Effect: Lagged Wage	No Fixed Effect: Head's Wage	No Fixed Effect: Spouse's Wage	No Fixed Effect: Lagged Wage
77	999	0.524	0.078	0.163	0.472	0.231	0.300
		(4.251)	(0.769)	(1.042)	(3.841)	(1.263)	(2.029)
78	1205	0.307	-0.173	0.294	0.396	0.248	0.325
		(2.632)	(-1.385)	(2.681)	(3.557)	(1.730)	(3.120)
79	1422	0.220	0.250	0.369	0.266	0.371	0.602
		(1.783)	(1.761)	(1.938)	(2.023)	(2.163)	(3.212)
80	1614	0.259	0.202	0.284	0.280	0.364	0.434
		(2.921)	(1.001)	(2.252)	(2.265)	(1.699)	(2.890)
81	1696	0.428	0.310	0.179	0.650	0.427	0.146
		(2.371)	(1.449)	(1.345)	(4.793)	(1.982)	(1.188)
82	1761	0.356	0.737	0.381	0.487	0.858	0.391
		(2.248)	(3.681)	(2.347)	(3.361)	(4.436)	(2.553)
83	1835	0.733	0.563	0.007	0.681	0.578	0.178
		(4.664)	(2.639)	(0.054)	(4.466)	(2.671)	(1.292)
84	1904	0.376	0.322	0.330	0.494	0.486	0.322
		(3.043)	(2.162)	(2.547)	(3.456)	(3.699)	(2.624)
85	1985	0.066	0.210	0.548	0.044	0.329	0.865
		(0.234)	(0.675)	(2.013)	(0.149)	(1.208)	(2.453)
Pooled	14421	0.354	0.257	0.293	0.412	0.406	0.401
		(6.469)	(3.126)	(4.653)	(7.683)	(5.070)	(6.299)

t-statistics in parentheses

Table 12
Including Current and Lagged Wage Rates - Results in Logs
Dummy for Nonworking Wife

		Fixed Effect			No Fixed Effect		
Year	Households	Head's Wage	Spouse's Wage	Lagged Wage	Head's Wage	Spouse's Wage	Lagged Wage
77	999	0.174	0.034	0.041	0.144	0.062	0.082
		(4.199)	(0.944)	(0.906)	(4.479)	(1.883)	(2.376)
78	1205	0.116	-0.023	0.061	0.128	0.083	0.083
		(3.082)	(-0.720)	(1.769)	(4.051)	(3.169)	(2.784)
79	1422	0.059	0.029	0.089	0.072	0.083	0.159
		(1.585)	(0.781)	(2.344)	(2.429)	(2.763)	(5.247)
80	1614	0.067	0.069	0.083	0.116	0.103	0.116
		(2.062)	(2.050)	(2.568)	(3.993)	(3.615)	(4.058)
81	1696	0.057	0.069	0.136	0.124	0.084	0.116
		(1.568)	(2.106)	(3.706)	(4.080)	(2.932)	(3.764)
82	1761	0.155	0.126	0.015	0.173	0.134	0.051
		(4.965)	(4.105)	(0.483)	(6.502)	(5.415)	(2.013)
83	1835	0.163	0.116	0.030	0.154	0.114	0.083
		(4.565)	(3.543)	(0.901)	(5.242)	(3.991)	(2.873)
84	1904	0.127	0.084	0.072	0.171	0.120	0.068
		(4.153)	(2.753)	(2.206)	(6.346)	(5.150)	(2.574)
85	1985	0.098	0.059	0.074	0.103	0.095	0.114
		(2.844)	(1.687)	(2.254)	(3.563)	(3.270)	(3.954)
Pooled	14421	0.114	0.065	0.069	0.134	0.097	0.099
		(9.588)	(4.466)	(5.752)	(13.063)	(7.705)	(9.793)

t-statistics in parentheses

Table 13
Dynamic Fixed Effect Test Basic Sample

		Fixed Effect		No Fixed Effect	
Year	Obs	Log	Level	Log	Level
77	1086	0.054 (1.082)	0.008 (1.133)	0.066 (1.600)	0.009 (1.421)
78	1254	0.156 (3.871)	0.021 (2.685)	0.122 (3.825)	0.017 (3.249)
79	1557	0.045 (1.110)	0.003 (0.441)	0.035 (0.960)	0.001 (0.253)
80	1848	0.030 (0.817)	0.009 (1.884)	0.059 (1.877)	0.011 (2.823)
81	2088	0.061 (1.899)	0.000 (0.743)	0.070 (2.604)	0.000 (-0.212)
82	2225	0.094 (2.894)	0.000 (-0.288)	0.098 (3.319)	-.001 (-0.956)
83	2554	0.065 (2.204)	0.006 (1.213)	0.074 (3.194)	0.006 (1.893)
84	2729	0.064 (2.261)	0.010 (3.249)	0.088 (3.699)	0.011 (3.990)
85	2848	0.037 (1.148)	0.007 (2.114)	0.056 (2.147)	0.006 (1.477)
Pooled	18189	0.063 (5.013)	0.002 (1.518)	0.074 (7.108)	0.002 (1.295)

t-statistics in parentheses

Table 14
The Effects of Household and Dynasty Non-Asset Income and Wealth on the Log of Food Consumption, 1984

Variable	OLS Logs	OLS Levels	IV on current non-asset income Logs	IV on current non-asset income Levels
Household non-asset income year 1984	.124 (4.08)	.013 (1.96)	.281 (10.63)	.040 (5.02)
Household non-asset income year 1883	.049 (1.46)	.007 (.906)		
Household non-asset income year 1982	.041 (1.35)	.014 (2.23)		
Household wealth 1984[a]	.142E-2 (2.96)	2.27 (2.46)	.011E-1 (2.60)	1.823 (1.347)
Dynasty non-asset income year 1984	.113 (2.44)	.021 (2.31)	.057 (1.71)	.069E-1 (2.15)
Dynasty non-asset income year 1883	-.058 (1.22)	-.020 (2.01)		
Dynasty non-asset income year 1982	.035 (.825)	.013 (1.61)		
Dynasty wealth 1984[a]	.054E-2 (.671)	1.397 (2.46)	.007E-1 (1.09)	1.523 (1.22)
Sum of Household income coeff.s	.214 (9.43)	.034 (7.66)		
Sum of Dynasty income coeff.s	.090 (2.80)	.015 (2.31)		
Number of households	2045	2045	2507	2507
χ^2-statistic[b] (P value) on dynasty income and wealth	15.10 (.005)	18.84 (.001)	6.70 (.035)	6.98 (.030)

t-statistics in parentheses.
a Wealth is measured in thousands of 1967 dollars.
b The χ^2 test statistics in columns 1 and 2 (3 and 4) have 4(2) degrees of freedom.

Table 15
The Effects of Current and Lagged Household and Dynasty Non-asset Income and Home Equity on Food Consumption

Year	#Households	Household Income in year: t	t-1	t-2	Dynasty Income in year: t	t-1	t-2	Home Equity HH	Dyn	Sum of Inc. Coeffs. HH	Dyn	χ^{2a} (P)
Logs												
Pooled	11905											
coeff.		.151	.030	.027	.061	-.0066	.008	.0027	.0020	.208	.062	19.58
t-stat.		10.42	2.27	2.34	3.20	.34	.42	3.69	1.44	13.97	3.04	.0006
Levels												
Pooled	11905											
coeff.		.013	.006	.011	.016	.001	-.002	4.59	2.40	.031	.015	19.10
t-stat.		3.39	2.07	3.32	2.14	.22	.48	3.06	1.02	8.43	3.68	.0007

a χ^2-statistic and associated P values are for joint test that dynasty income and wealth variables are all zero.
HH stands for household.

Table 16
Tests of the Life Cycle Model

Year	Households	OLS Estimates: HH Total Income	OLS Estimates: Dynasty Total Income	IV Estimates: HH Total Income	IV Estimates: Dynasty Total Income
Pooled Logs	21711	.261	.048	.337	.023
		(25.3)	(3.29)	(21.4)	(1.12)
Pooled Levels	21711	.0219	.0142	.040	.010
		(4.11)	(5.52)	(7.01)	(3.02)

t-statistics in parentheses.
HH stands for household.

Table 17

Dynamic Tests of the Life Cycle Model: The Effects of Household and Dynasty Income and Wage Rate Changes on Changes in Food Consumption[a]

	1 Year Changes			2 Year Changes		
Household Variables	OLS	OLS [c]	IV [c]	OLS	OLS [c]	IV [c]
Change in log of household income	.065 (5.39)			.133 (10.2)		
Change in log of wage of household head		.035 (2.67)	.455 (2.86)		.061 (4.75)	.280 (3.35)
Dynasty Variables						
Change in log of average dynasty income	.022 (1.16)			.005 (.278)		
Change in log of average dynasty wage of head		-.014 (.728)	-.228 (1.31)		-.026 (1.37)	.088 (.733)
Number of Observations	18200[b]	12203	6621	14980	9747	5038

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a All equations include year dummies and controls for changes in demographics. The equations that include wage rates also include dummy variables for year t and t-j (j=1 or 2) that equal one if a wife was present in the given year and worked a positive number of hours in the previous year at an hourly wage rate greater than $.50.

b Due to a minor discrepancy in the computation of lagged values, the sample for column 1 exceeds the sample for the dynamic fixed effects test of the life cycle model by 11 observations (Table 13). This has no effects on the results.

Notes to Table 17 continued

c The wage rate in the consumption equation is annual labor earnings of the head divided by annual hours. It refers to the calendar year before the survey. The samples for columns 2 and 3 (columns 5 and 6) exclude households in which the household head did not work or had an average wage rate of less than $.50 in either year t or year t-1 (t and t-2). The principal instrument for the change in the average hourly wage in columns 3 and 6 is the change in a second wage measure that refers to the job held at the time of the survey. This second wage measure is based on a direct question about the hourly wage in the case of hourly workers and is imputed from a question about earnings per week, per month, etc. in the case of salaried workers. The mean of this alternative wage change measure taken across households in the dynasty is also used as an instrument together with all the control variables that appear in the consumption change equation. The sample in column 3 (6) is further restricted to households for which both wage measures are available in years t and t-1 (t and t-2). However, the difference in the samples has little to do with the increase in the absolute value of the coefficients that arises when instruments are used. Altonji (1986) discusses the properties of the two wage measures and also estimates labor supply and consumption equations using the change in the survey wage as an instrument for the change in the hourly wage. He concludes that measurement error in the average hourly wage is severe. The large increase in the coefficient estimates when instruments are used may also be due to the fact that the second wage measure and the consumption data both refer to the time of the survey.

Notes

1. Recent studies include Bernheim (1986), Hurd (1987), Jianakopolos, Menchik, and Irving (1987), and Hayashi, Ando, and Ferris (1988).

2. Recent studies that have used the PSID child splitoffs include Altonji (1988), Behrman, Pollak, and Taubman (1989), and Solon et. al.(1987). While food is the only consumption data in the PSID (other than expenditures on utilities and information on housing and automobiles for which rental services would need to be imputed) food is a nondurable and is a major component of nondurable consumption expenditure. Food expenditures should respond to altruistic transfers unless those transfers are in kind and the amount of such in kind transfers exceeds what the household would voluntarily purchase if the transfer had instead been made in cash.

3. The estimation of Frish demands in the levels sharply distinguishes between the altruism model and the life cycle model regardless of whether the life cycle model admits selfish risk pooling among extended family members. In contrast, as we discuss below, estimating first differences of Frish demands can distinguish altruism from the life cycle model with no risk pooling, but it cannot distinguish altruism from the life cycle model with selfish extended family risk pooling.

4. See Kotlikoff, Razin, and Rosenthal (1988) for a model in which transfers are not taken as given.

5. See MaCurdy (1981) and Heckman and MaCurdy (1980) for an early use of fixed effects methods in estimating Frisch demand functions from panel data on individuals.

6. The fixed effect estimation in this case of only one child and one parent is equivalent to taking the difference between the logarithm of C_{pi} and the logarithm of C_{ki} as the dependent variable. Clearly, the fixed effect drops out of this regression, and the log difference of the parent and child's consumption should depend only on the weights θ_p and θ_k and not on the difference between the parent and child's incomes.

7. Note that provided $[\theta_p - \theta_k T_p/T_k] > 0$ this preference structure is consistent with the parent caring about the child's utility per se as well as the child caring about the parent's utility per se. To see this simply substitute from the two equations to write the parent's utility as $U_p = [\theta_p - \theta_k T_p/T_k]U(C_p) + \theta_k U_k$ and the child's utility as $U_k = [T_k - T_p\theta_k/\theta_p]U(C_k) + T_p U_p$.

8. The CES function specified in (6) is, itself, an indirect utility function that incorporates optimal within-household allocation of the total household consumption of each good. This form of the household indirect utility function will arise if the household's direct utility function is a weighted sum of CES functions, one for each household member, with the weights depending on the demographic characteristics (e.g. age and sex) of the household member. Suppose, for example, the direct household utility function is $V = \theta_1[aF_1^{-\rho} + bG_1^{-\rho}]^{-\eta/\rho} + \theta_2[aF_2^{-\rho} + bG_2^{-\rho}]^{-\eta/\rho}$, where F and G denote food and another good, respectively, the subscripts 1 and 2 refer to household members 1 and 2, a, η. and ρ are parameters, and θ_1 and θ_2 are weights that may depend on the demographic characteristics of persons 1 and 2. Since the ratio of F_1 to F_T, where F_T is total household consumption of food, equals the ratio of G_1

to G_T, where G_T refers to total household consumption of good G, and since these ratios depend only on θ_1 and θ_2, the utility function V can be written as $V=\zeta(\theta_1,\theta_2)[[aF_T^{-\rho}+bG_T^{-\rho}]^{-\eta/\rho}$, where $\zeta(\ ,\ )$ is a function that depends only on θ_1 and θ_2. In addition to weights on each member's CES function, the weights on the commodities within each member's CES function might depend on the demographic characteristics of the household member; in this case the household's indirect function is not a CES function of aggregate consumption of each good, but the log of aggregate household consumption can still be written as the sum of the logarithm of the marginal utility of income plus a term that involves the household's demographics and the prices of the consumption goods.

9. The constant absolute risk aversion form of the household's indirect utility function arises if the underlying direct utility function of the household is also a weighted sum over members of the weighted sum of each member's constant absolute risk aversion function for each commodity, with weights depending on the good in question and the demographic characteristics of the individual household member.

10. Our fixed effect test may be valid even if the υ in (7) and (8) is household specific, i.e., they are indexed by the household identifier k. In the case of equation (7) the error in our fixed effect regression will include $1/(\upsilon_k-1)\log\lambda_t$ less $[\overline{1/(\upsilon-1)}]\log\lambda_t$, where this last term is the average of this term, where the average is computed over all sample households k in the dynasty. If this difference is not correlated with the household's resources, our test of altruism will still be valid. The dynamic tests described below are valid for such preferences assuming the change in the household's resources is not correlated with changes in $[1/(\upsilon_k-1) - \overline{1/(\upsilon-1)}]\log\lambda_t$.

11. Such an indirect household utility function will not arise in the case that the direct household utility function is a weighted (based on demographics) sum of CES functions, one for each member, where each members' CES function depends on his or her consumption of each commodity and leisure. While this direct utility function does not give rise to a CES function in aggregate household consumption of each good and leisure of each household member, this direct utility function does imply that the log of aggregate household consumption demands as well as the log of each member's leisure is separable in the log of the marginal utility of income, on the one hand, and household demographics and prices (including members' wages), on the other.

12. If the dynasty is not liquidity constrained, this difference plus a term involving the time t interest rate, equals the logarithm of the multiplicative Euler error. Note that our dynamic as well as static tests are valid even if the dynasty is liquidity constrained.

13. It may be useful to compare this estimation with the Euler equation approach applied to panel data (see Hayashi, 1987 for a survey of the Euler equation approach in micro data). The standard micro data test of the Life Cycle/altruism models under rational expectations involves estimating a consumption change equation of the following sort:

$$\Delta f_{it} = \beta'\Delta X_{it} + \Psi\Delta Y_{i,t-1} + \tau e_{it} + \Delta u_{it}$$

This equation is estimated across households using data on households' consumption changes. Since these analyses do not consider extended family behavior, the tests do not control for fixed effects in the consumption of extended family members. The central question posed in these analyses is whether the lagged earnings coefficient Ψ differs from zero. A significant coefficient is viewed as evidence against the Life Cycle/altruism models. As Chamberlain (1984) pointed out, the prediction of a zero coefficient on lagged income only arises, strictly speaking, in a regression on an individual household using longitudinal data. In the cross section, the Euler error can be correlated with lagged income changes across households without violating the Life Cycle/altruism models. In contrast to these tests of the Life Cycle/altruism models against the Keynesian alternative, our test of the altuism model against the Life Cycle/Keynesian alternatives controls for the Euler error through the fixed effect estimation and, as such, does not require any assumption about the correlation (or lack thereof) across households of the time t Euler error with information available at time t-1.

14. Note that the static fixed test of altruism verses the Keynesian/Life Cycle models remains valid even if there is selfish Life Cycle risk sharing. At a point in time s, Life Cycle risk sharing leads to the fixed effect model: $\log C_{ps} = (1/T)\log\theta_p - (1/T)\log\lambda_s$ and $\log C_{ks} = (1/T)\log\theta_k - (1/T)\log\lambda_s$. If one regresses the log of consumption against the fixed effect $-(1/T)\log\lambda_s$, demographics, and household income, household income will enter significantly because the bargaining weights, θ_p and θ_k, will depend on the initial resource position of the parent and child. This is not the case in the altruism model, in which utility weights reflect preferences, not bargaining power.

15. We constructed the age-sex variables by counting the number of persons who were in a particular household and in a particular age/sex category in a given year. We determine the number of persons in an age/sex category in a household in a given year, say t*, by using the household identifiers in year t*. Our method is to collect all individuals in the data in 1985 who have a particular year t* household identifier, and then to count the number of these persons by their year t* age and by their sex. Since inclusion in our age/sex counts for year t* requires that the individual be included in the 1985 data tape, we may be undercounting because some individuals left the PSID prior to 1985. Fortunately, the PSID reports for each year t* the number of adults and children in the household in year t*. We have used these aggregate counts to check the extent of undercounting arising through our detailed age/sex categorization. We found little undercounting arising because of attrition from the PSID.

16. In terms of the simple model described in equations (1) and (2), the child dummy captures the terms involving θ_{ip} and θ_{ik}.

17. For evidence on this correlation found in the PSID data see Altonji (1988) and Solon, et. al. (1987).

18. For the log specification, the R^2s of the first stage of the IV estimation underlying Table 16 are .714 for household income and .764 for dynasty income. The R^2 of the OLS consumption regression is .381.

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