ISSN 1084-1695

Aging Studies Program Paper No. 18

Estimating the Income Effect on Retirement

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April 1999

Support for the Aging Studies Program Series is provided by grant number P20-AG12837 from the National Institute on Aging.

Abstract

One of the most important issues in the debate over Social Security is how various changes in the system would change retirement behavior. A critical parameter in this context is the income effect on retirement—how a change in income affects retirement behavior, *ceteris paribus*. To estimate the income effect, we examine tax-return generated data on the labor force activity of a group of older people before and after they receive inheritances. The results are consistent with the notion that income effects are small. Neither retirement decisions nor the magnitude of earnings conditional on working seem to be affected very much by the receipt of an inheritance.

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1. Introduction

One of the most important issues in the debate over Social Security is how various changes in the system would affect retirement behavior. This question has been addressed by a very large empirical literature. (See the review by Lumsdaine and Mitchell 1998.) A typical approach is to examine the differences in labor force participation among individuals who have different Social Security benefits, using either cross-sectional, time series, or panel data. A couple of important practical problems are associated with this strategy. First, the investigator may not know individuals' *actual* Social Security benefits; they generally have to be estimated on the basis of (possibly incomplete) data on earnings history, marital status, and so forth. Second, Social Security benefits may be endogenous—benefits are tied to past earnings, and unobserved differences across individuals in their past work behavior may be correlated with their current labor force decisions. Put differently, it is very difficult to locate well measured, exogenous differences in retirement benefits. Hence, there is still a great deal of disagreement on how various changes in Social Security would affect retirement behavior.

Although the decision to retire is in principle very complicated, it is useful to think about the problem in terms of the simplest model of leisure-consumption choice.[1] In that setting, the effect of a change in a worker's incentives depends on an income effect and a substitution effect. Our focus in this paper is on the latter—how an exogenous change in income affects retirement decisions. To the extent that various reform proposals involve changes in potential retirees' incomes, then knowing the magnitude of the income effect is central to assessing the impacts of such proposals. And even when policies change the net wage associated with working, the usual Slutsky decomposition tells us that the income effect in part determines the impact on labor supply decisions. In a similar spirit, assessing the efficiency consequences of Social Security, tax, or other government policies generally require analyses to separate the substitution effects and income effects on labor supply.

A key part of the empirical strategy suggested by this agenda is finding plausibly exogenous changes in the income or wealth of older individuals that can be used to determine the effect of the change in income or wealth on retirement probabilities, *ceteris paribus*. For example, Krueger and Pischke (1992) examined an exogenous change in Social Security benefits that involved one group of retirees (the "notch babies") and not others. By comparing retirement behavior of the two groups, Krueger and Pischke were able to infer the impact of changes in Social Security wealth upon retirement probabilities. They found that, *ceteris paribus*, changes in the magnitude of Social Security wealth are statistically insignificant. Similarly, Neumark and Powers (1998) took advantage of state-by-state differences in the generosity of benefits for Supplemental Security Income (SSI) to estimate this program's impact on the labor supply effects of older men who are not yet eligible for Social Security. They found that SSI has a modest impact on the labor supply and earnings of this subset of the older population, suggesting that an income effect is present.

The Krueger-Pischke and Neumark-Powers papers illustrate the difficulty of finding exogenous changes within the context of the modern Social Security system. Two important historical studies have sought to estimate income effects on retirement using earlier programs that provide more suitable "natural experiments." Friedberg (1998) analyzed data from the 1940 and 1950 censuses to estimate how retirement decisions varied with differences in benefits received from Old Age Assistance (OAA), a now defunct federal transfer program. Importantly, OAA benefits varied by state, affording a source of exogenous variation. An even earlier historical episode was studied by Costa (1995), who analyzed the effect of pensions on the retirement decisions of Civil War veterans. Veterans of the Union Army were eligible for a pension regardless of labor force participation and regardless of current or past income. The amount depended only on their health status and whether any disabilities could be linked to the war.

Both Friedberg and Costa found substantial income effects. Friedberg estimated an elasticity of labor force nonparticipation with respect to retirement income ranging from 0.25 to 0.40, depending on the specification. Costa found a nonparticipation elasticity of 0.73. In their review of a number of historical studies, Pope and Wimmer (1998, p. 219) concluded that "at the turn of the century there existed a strong relationship between income and retirement" but that "the importance of current income or wage upon the retirement decision has been declining over time."

This paper brings a unique—and more modern—data set to bear on the problem of measuring the income effects associated with retirement behavior. The sample consists of the 1982 and 1985 federal individual income tax returns of a group of older people who received inheritances in 1982 and 1983, along with information about the size of their inheritances.[2] Tax return data in 1982 and 1985 allow us to compute how many members in the household were participating in the labor force in each year. We examine their transitions into and out of the labor force between 1982 and 1985, and the effect of the size of inheritances upon these transitions. This allows us to infer the income effect on the probability that a single individual, or one or both members of a married couple, retires.

The data and empirical strategy are described in Section 2. Section 3 presents the results, which are consistent with the notion that income effects are small. Neither the retirement decision nor earnings conditional on working seem to be altered very much by the receipt of an inheritance. Section 4 concludes with a summary and suggestions for future research.

2. Data and Empirical Strategy

Construction of our data set began with an Internal Revenue Service (IRS) sample of estate tax records. The IRS selected a 1 percent sample of estate tax returns of people who died in 1982 and whose estate tax returns were filed in 1982 and 1983. In addition, returns with total assets over

$1 million were sampled at a 100 percent rate. The sample included over 8,500 individuals with gross estates over $300,000, the (arbitrary) cutoff point selected by the IRS for minimum estate size.[3]

The next step was to match the estate tax returns with the beneficiaries' personal income tax returns for 1982 and 1985. We dropped some observations because of the inability to make matches, missing data, etc. Given our focus on retirement issues, we retained only the returns of beneficiaries who were aged 62 or older in 1985.[4] As noted, our focus is on labor market transition between 1982 and 1985. The number of observations with useable data for these two years is 1,751. Of these, 1,048 are filed by married couples ("joint returns"), and 703 are filed by individuals ("single returns"). The mean age of the beneficiaries in the sample is 66.6 years.

Married couples and individuals pose somewhat different data issues. With respect to married couples, our information about the labor market status of each spouse comes from Schedule W, the two-earner deduction reported on Form 1040. Between 1982 and 1986 families with two earners were allowed a tax deduction of 10 percent of the lower-earning spouse's earned income (up to a maximum of $3,000), provided that they filed schedule W.[5] For purposes of Schedule W, "earnings" include wage and salary income, and income from a sole proprietorship (Schedule C).[6] Hence, Schedule W allows us to determine how many members of the family participated in the labor force each year. In effect, spouses who reported wages and salary or sole proprietorship income are counted as labor force participants, and otherwise not. Unfortunately, the data do not allow us to determine which spouse is which. Thus, for example, if there were two participants in 1982 and one participant in 1985, we do not know which one dropped out of the labor force. Indeed, even if there was one spouse who participated each year, we do not know whether this was the same spouse in each year. Moreover, although we know earnings for each individual, IRS data do not include hours of work. Hence, we cannot compute wage rates.

For single returns, we classify those individuals who report wage and salary or sole proprietorship income as being in the labor force. Here we have no problems in matching the relevant actor to his or her earnings and age. Again, however, hours of work and wage rates are unknown to us.

These considerations suggest that it would be futile to attempt to specify a structural retirement model along the lines of, for example, Rust and Phelan (1997). Such an approach requires data on each person's potential wage rate, Social Security benefits, health status, and various demographic variables. In our data set, we cannot calculate wage rates because we have no information on hours worked, and even if we could calculate wage rates, we could not match them to the correct individuals on joint returns. Similarly, we have no information on actual or potential Social Security benefits.

Given these limitations, we choose a more modest approach that is tailored to the strengths of our data. To begin, we divide the sample into three groups based on the size of inheritance. For each inheritance group we construct a transition matrix that shows how the number of earners in the family (zero, one, or two for joint returns; zero or one for single returns) changes between 1982 and 1985. We then make inferences about income effects by examining the transition matrices to see whether they differ, and if so, how. Clearly, a concern is that other variables may affect labor supply differentially among the three groups. If so, one cannot interpret the results as reflecting the independent effects of inheritance. Therefore, we examine the robustness of our results via some simple multivariate analyses of retirement decisions.

3. Results

In this section, we focus first on how transition probabilities for retirement vary with the size of inheritance. We then turn to a multivariate analysis of the retirement decision.[7]

Transition Matrices

The results for single returns are found in Table 1. It consists of three transition matrices, one each for inheritances under $25,000, inheritances between $25,000 and $150,000, and inheritances greater than $150,000.[8] Each row shows the number of labor force participants in 1982, the columns show the number in 1985. Within each cell, the first figure is the number of observations in that cell. The second figure is the proportion of observations in the corresponding *row* that fall in the cell. The figure in parentheses is the associated standard error. Thus, for example, the element in the second row and first column of the first matrix tells us that 61 of the single individuals in our sample with inheritances below $25,000 went from being in the labor force in 1982 to not being in the labor force in 1985, and that these 61 individuals represent 31.9 percent of all the individuals in this group who were in the labor force in 1982.

Is there an inheritance-induced income effect on retirement? According to Table 1, 31.9 percent of the individuals in the low inheritance group exited the labor force between 1982 and 1985; 47.1 percent of the middle group were out by 1985; and 41.3 percent of the high inheritance group were out of the labor force in 1985. (See the second rows of the matrices in Table 1.) This almost 50 percent rise as we move from the low to the high inheritance groups is consistent with the presence of income effects on retirement probabilities. However, these differences are not uniformly statistically significant. For example, the chi-square test statistic (with two degrees of freedom) for the null hypothesis that the transition probabilities are identical is 6.34, while the critical value at the 0.05 level is 5.99. However, pairwise comparisons of the transition probabilities for the, middle

versus high groups and low versus high groups indicate that the differences are not statistically significant, while the difference between the low and middle group *is* statistically significant.

To the extent that income effects are present, we would also expect that individuals who are initially out of the labor force would have a lower probability of entering the labor force the greater their inheritance, *ceteris paribus*. Taken at face value, the results in Table 1 are at odds with this notion—the probability of entering the labor force between 1982 and 1985 actually rises from 1.8 percent in the lowest inheritance group to 4.5 percent in the highest. But the increase is based on very few observations.[9] Perhaps the key lesson to be learned here is that the response to inheritance might very well depend on one's initial labor force status.

For completeness, we also tested the hypothesis that entire transition matrices (not just individual cells) are the same. The associated chi-square statistic is 15.2 with 6 degrees of freedom, which is statistically significant at the 1.8 percent level. This result is driven by the differences among individuals who were initially in the labor force.

We next consider the corresponding results for joint returns, which are presented in Table 2. Consider first families that had one earner in 1982. In the low inheritance group, 30.0 percent of these earners were out of the labor force in 1985; in the middle group 35.5 percent were out in 1985; and in the high inheritance group 36.5 percent were out of the labor force in 1985.[10] Thus, the greater the inheritance, the greater the propensity to go from a one-earner family to a family with no one in the labor force. Next consider families with two earners in 1982. As we move from low to medium inheritance groups, the percentage in which both earners opt out of the labor force is roughly unchanged (7.5 versus 7.0 percent), before rising sharply to 29.3 percent in the high inheritance group. The percentage in which labor force participation falls from two members to one member increases from 36.2 percent to 36.8 percent, before rising to 39.0 percent.

A consistent story appears to emerge—higher inheritances are associated with a greater propensity to retire. Further, as with the single returns, some (but not all) of the cell proportions are statistically different from each other in pairwise comparisons. For example, in comparisons of returns with two earners in 1982, the transition probability to zero labor force participation is significantly different between the middle and high inheritance groups, and also between the low and high inheritance groups, but not between the low and middle inheritance groups. Broadening the focus slightly, we can examine differences conditional on the number of workers in the labor force in 1982. Specifically, we test whether the second rows in each table are the same. The null hypothesis that the labor force behavior of one-earner families in 1982 is independent of inheritance is not rejected by a chi-square test—the test statistic is 2.26 with 4 degrees of freedom. Turning to the third rows, the corresponding test for two-earner families in 1982 is 16.9 with 4 degrees of freedom, which is significant at the 1.0 percent level.

As noted earlier, in the presence of income effects, the propensity to enter the labor force should decline as inheritance increases. The point estimates in Table 2 do not provide much evidence for this view. The transition rate from one-earner to two-earner households is lower in the top inheritance group than in the bottom group, but the fall is not monotonic. Further, the point estimates of the transition from zero-earner to one-earner households increase with inheritance. However, not all of the differences are statistically significant on a pairwise basis.

As in the case of single earners, it is useful to test for the presence of income effects on labor force transitions as a whole. The chi-square statistic associated with the hypothesis that the three matrices in Table 2 are identical is 26.3 with 14 degrees of freedom. Thus, the differences in labor force transitions as a whole are statistically significant at better than the 3 percent level.[11]

An interesting feature of both Tables 1 and 2 is that labor force participation in 1982—*before* the inheritance is received—appears to vary inversely with the size of inheritance. In Table 1, participation falls from 53.1 percent in the low inheritance group, to 45.5 for the middle group, and to 41.4 for the high inheritance group. For the joint returns in Table 2, the percentage of two-earner couples in 1982 falls steadily with inheritance; the figures are 21.6, 16.6, and 15.6 for the low, middle and high inheritance groups, respectively. Lastly, the percentage of joint returns with no earners in 1982 rises from 31.0 to 33.4, and reaches 36.3 for the high inheritance group.[12] One might speculate that individuals retire in anticipation of receiving an inheritance in the future. That is, they optimize freely with respect to an intergenerational budget constraint as suggested by Barro (1974). In neither Table 1 nor Table 2, however, are the differences statistically significant. Hence, we need not be overly concerned that our estimates of the income effect are biased downward because part of the response occurs prior to actual receipt of the inheritance.

Multivariate Analysis

The discussion surrounding Tables 1 and 2 suggests that there may be income effects upon retirement decisions, but the case is not clear. For single individuals, retirement probabilities increase with inheritance, but the effect is not statistically significant. For couples, the effects are generally significant, but not always. A natural question is whether we can sharpen the results by moving to a regression framework that imposes more structure and takes into account other variables that might affect retirement decisions.

We begin with the sample of single returns where there is clear identification of age and labor force participation. At the outset, we estimate a logit equation for the probability of being in the labor force in 1985 that includes on the right hand side only the logarithm of inheritance, an indicator for labor force participation in 1982, and an interaction of the two.[13] Essentially, this is a more structured

version of the information in Table 1. The results, which are reported in the first column of Table 4, are similar in spirit to those found in Table 1. First, the data exhibit persistence—the coefficient on labor supply in 1982 is positive and highly significant. Second, there is a difference between the effects on those in the labor force in 1982 versus those who were not working. Specifically, the direct effect of (log) inheritance is positive, while the interaction term is negative. The net effect of the direct and interaction effects indicates a negative impact on the probability of remaining in the labor force. Third, the terms involving inheritance are individually insignificant. A chi-square test of the joint hypothesis that both coefficients equal zero (5.49 with two degrees of freedom) is significant only at the 6 percent level.[14]

In column (2) we augment the equation with a set of variables relating to the individual's economic and demographic status. Tax returns provide only a limited number of such variables, but there are some useful controls. (See Table 3 for the definitions of the variables and the associated summary statistics.) These include age in 1985,[15] earnings in 1982, dividends plus interest in 1982, and the number of dependents. The terms involving inheritance continue to be individually and jointly insignificant.[16] Thus, including other covariates does not change our basic conclusion from column (1): for individuals who were previously in the labor force the point estimate of the effect of inheritance is negative, but it is imprecisely estimated.

Is the imprecise point estimate large or small? To gain a feel for the implications of the logit estimates, we employ the coefficients to calculate the probability of being in the labor force in 1985, assigning all the right-hand side variables their mean values. We then recompute the probability after increasing the inheritance by 10 percent, *ceteris paribus*. The estimated probability changes from 0.1600 to 0.1597, a decrease of only 0.03 percent. Thus, the effects of inheritance on single people's retirement decisions is quantitatively small as well as imprecisely estimated. This finding is in the

same spirit as Krueger and Pischke's (1992) result that changes in Social Security wealth do not have statistically discernable effects upon retirement decisions. It is also consistent with Lumsdaine and Mitchell's (1998, p. 46) characterization of the consensus in the empirical literature: "Older people appear to have strong preferences for leisure, such that it takes a rather substantial change in pensions and/or Social Security to change peoples' retirement behavior by much."

We now turn briefly to the other variables in column (2). The dichotomous age variables *AGE*62-64 and *AGE*65-69 are statistically significant, while *AGE*70-74 is not. Thus, relative to the omitted group (over age 74) those in the age range 62 to 69 are more likely to be working. Interpreting earnings as a measure of the opportunity cost of leaving the labor force leads one to expect that individuals with higher earnings will be less likely to retire. The coefficient on the logarithm of earnings is indeed positive, although it is only marginally significant ($t = 1.56$). If we think of interest plus dividends as an indicator of the individual's wealth (prior to inheritance) and if leisure is a normal good, then we would expect the coefficient on ln(DIV + INT) to be negative. While the sign is consistent with this, the coefficient is estimated quite imprecisely. This may be due to the fact that the sum of dividends plus interest is probably a poor measure of capital income. It does not include, for example, the interest on municipal bonds or unrealized capital gains. The point estimate of the impact of the number of dependents upon labor force participation is positive, but likewise insignificant.

We next turn to a similar examination of inheritance and retirement behavior of married couples. Given that the family's labor force status in 1985 falls into one of three naturally ordered categories (zero, one, or two people in the labor force), the ordered logit statistical model discussed by Maddala (1983, pp. 46-49) provides a sensible framework for the analysis. The results are reported in Table 5. The first column shows how the probability of having a greater number of

participants in the labor force in 1985 varies with inheritance, conditional on the number of people in the labor force in 1982, and interactions with inheritance.

As was the case for single individuals in Table 4, the direct effect of (log) inheritance is positive and statistically insignificant, but the net effect of the direct and interaction effects indicates a negative impact on labor supply. Specifically, the interaction effects with the indicator variables for one worker in 1982 and two workers in 1982 are negative and larger in absolute value than the coefficient on inheritance alone. The joint test of the hypothesis that all the inheritance coefficients are equal to zero (a chi-square test equal to 11.7 with three degrees of freedom) has a *p*-value of 0.009.[17] Unlike the case of the singles, the effect of inheritance is significant.

The next question is whether this finding continues to hold after the inclusion of other variables that might affect labor force participation. As before, in column (2) we augment the set of right-hand side variables with variables related to age,[18] number of dependents, earned income, and the sum of dividends and interest. The point estimates on the interaction terms suggest that if either spouse participated in the labor market in 1982, then receipt of an inheritance reduces the probability of participating in 1985. While these three coefficients are not all precisely estimated, jointly they are significant at the 0.007 level, a result similar to that in column (1).[19]

As with single individuals, it is useful to assess the quantitative implications of the multivariate results. Again, we use the coefficients to simulate the impact of a 10 percent increase in inheritance by evaluating the right-hand side variables at their means, computing the probabilities of zero, one, or two workers, and then re-computing with inheritance raised by 10 percent. The computation indicates that the increase in inheritance raises the probability of having zero workers by 0.004 (or 0.8 percent) lowers the probability of having one worker by 0.003 (or 0.8 percent), and decreases the probability of having two workers by 0.001 (or 1.5 percent). Thus, the multivariate analysis suggests

the same conclusion as Table 2—an inheritance received by a family reduces the probability that both spouses will continue to work, and increases the probability that both will retire. An income effect seems to be operative and is statistically significant, although its magnitude is small.

A possible source of misspecification in our results arises from the fact that we cannot distinguish between anticipated and unanticipated inheritances. Of course, there is no direct way to decompose an inheritance into its anticipated and unanticipated components. However, it is possible that children of a decedent are more likely to anticipate their inheritances than other relations. Hence, comparing the labor supply responses of children with other recipients might shed some light on this issue. We therefore defined a dichotomous variable that equaled one if the donee was a child of the decedent and zero otherwise. We then augmented the equations in the second columns of Tables 4 and 5 with this variable and its interaction with the log of inheritance.[20]

The interaction term was statistically insignificant in the sample of single returns, with a t-statistic of -0.021. In the joint return data, on the other hand, the interaction term was negative (-1.094) with a t-statistic of -1.65.[21] Taken together, these results suggest that being the child of a decedent has no effect on the impact of inheritance on retirement, a finding that does not reconcile easily with free intertemporal optimization. However, one must take this observation with a grain of salt, since we have no evidence that the interaction variable adequately reflects the extent to which the inheritance is anticipated.

Earnings Changes

So far, our focus has been the income effect on retirement rates.[22] However, even donees who stay in the labor force might be induced by income effects to reduce their hours of work and hence earn less, *ceteris paribus*. Accordingly, in this section we examine how inheritance affects earnings, conditional on staying in the labor force. Before presenting the results, we stress that some

caution is required in their interpretation. Imagine that we observe earnings falling as the size of inheritance increases. One possibility is that hours of work have fallen. Alternatively, hours could have stayed the same, and the wage rate fallen. The decline in the wage rate might be due to the fact that with higher wealth, individuals may choose jobs with more "desirable" characteristics that have lower wage rates. (However, we are aware of no empirical evidence that this phenomenon exists.)

With these caveats in mind, we analyzed the percentage change in earnings for those families in which the number of earners is the same in 1982 and 1985. In terms of the matrices in Table 1, these are the individuals in the lower right-hand cell. In Table 2 they occupy the cells on the diagonal for families with one earner each year and with two earners each year. To begin, for the relevant sample of single individuals, we estimated a regression of the percentage change in real earnings (log of earnings in 1985 minus the log of earnings in 1982) on the logarithm of inheritance. The results are reported in column (1) of Table 6. The coefficient on inheritance is negative (-0.037), but not estimated precisely. In column (2) we add our age variables, the log of dividend and interest income, and the number of dependents. The coefficient and standard error on ln (INH) are little changed. In columns (3) and (4) we repeat the exercise for earnings on joint returns. Here, again, we have negative inheritance effects, but they are closer to significant at conventional levels. To assess the quantitative implications of these estimates, note that an increase in inheritance of 10 percent (or, just over $10,000 for both single and married individuals) would reduce earnings on a single return by 0.48 percent and on a joint return by 0.61 percent. For a single individual, this is roughly $18 in 1985, while for a married couple the 1985 earnings would fall by $69 (both measured in 1982 dollars). Given the qualifications mentioned above, one must necessarily be cautious in interpreting these results, but if one takes them at face value, they suggest that there is at best only a modest income effect on the hours worked by the elderly.

4. Conclusions

We have examined tax-return-generated data on the labor force behavior of retirement-aged people before and after they received inheritances. Taken together, the results suggest that the income effects associated with retirement decisions are weak. For single people, we found no statistically discernible differences in retirement behavior between individuals who received large and small inheritances. For couples, the impact of inheritances was sometimes significant in a statistical sense, but always quite small quantitatively. Similarly, conditional on remaining in the labor force, inheritance exerted only a small impact on earnings. On this basis, we would expect that only substantial changes in Social Security benefits would affect retirement decisions very much, a finding that is consistent with much of the previous literature.

Endnotes

*The authors are respectively, affiliated with Syracuse University and NBER, the U.S. Department of Treasury, and Princeton University and NBER. The authors are grateful to the National Science Foundation, Princeton's Center for Economic Policy Studies, and the Center for Policy Research at Syracuse University for financial support. They also thank Stephen Wu and Rebecca Porcello for research assistance, Esther Gray for preparing the manuscript; and Robin Lumsdaine, Olivia Mitchell, and members of Princeton's Public Finance Working Group for useful suggestions.

1. One important complexity ignored by the simple model is that the retirement decision depends not only on the level of benefits, but the pattern of their accrual. See Gruber and Wise (1998).

2. Holtz-Eakin, Joulfaian, and Rosen (1993) analyze the labor supply decisions of younger members of this sample using a similar method.

3. The $300,000 cutoff corresponds roughly to the threshold for filing an estate tax return during this period. The actual threshold was $225,000 in 1982, $275,000 in 1983, and $325,000 in 1984.

4. The ages in our sample range from 62 to 70 in 1985.

5. For 1982 the deduction was 5 percent of earned income.

6. Schedule W earnings also include income from partnerships (Schedule E). Partnership income may be more indicative of tax shelter activity than participation in the labor force, so returns with partnerships were deleted. However, when partnership returns are included, none of the substantive results reported below change.

7. Here and throughout we identify nonparticipation in the labor force as "retirement." As Quinn (1998) and others have noted, many Americans retire in stages rather than a single step. Further, some elderly people may "retire" from the labor force in one year and return the next. Nevertheless, many individuals do follow the one-step pattern, and it is common in the literature to assume that once an elderly person leaves the labor force, he or she stays out. See, for example, Lumsdaine (1992).

8. The cutoffs were chosen to provide an adequate number of observations in each range, and the substantive results are not sensitive to minor changes in the inheritance ranges. The ranges reflect net receipts of inheritances by the beneficiaries. We have no information on state inheritance taxes paid by donees, but this is irrelevant for our purposes. In general, on estate tax returns one receives a dollar for dollar credit for inheritance taxes paid to states. The median ratios of inheritance to 1982 Adjusted Gross Income in the low, middle, and high inheritance groups are 0.309, 3.16, and 10.6 respectively.

9. Neither the pairwise nor joint differences are statistically significant.

10. The median ratios of inheritance to 1982 Adjusted Gross Income in the low, middle, and high inheritance groups are 0.199, 2.34, and 7.31 respectively.

11. An interesting question is how the transition matrices in Tables 1 and 2 would compare with those in a "control group" that received no inheritances. In this context, it is important to note that the median inheritance in our "low" groups is only about $5,000. From the point of view of labor force participation decisions over a four-year period, the "low inheritance" groups may effectively serve as "no inheritance" groups. This conjecture was confirmed when we examined analogous transition matrices computed using 1982 and 1985 data from the PSID for comparably aged individuals who reported no inheritances between those two years. On a cell-by-cell basis, one could not reject the hypothesis that the transition rates in the PSID data were the same as the corresponding rates from Tables 1 and 2.

12. *After* receiving an inheritance, the labor force participation rates in the low, middle, and high inheritance groups for the single returns are 36.9, 25.1, and 27.0, respectively. For the joint returns, after inheritance the corresponding proportions of two-earner couples are 14.9, 11.6, and 7.6; and the proportions with no earners are 46.2, 50.0, and 55.0. (In no cases are the differences statistically significant.)

13. The substantive results are unchanged when the level of inheritance is used.

14. We obtain similar results using a specification in which the size of the inheritance is entered in levels, as opposed to logarithms. In this instance, the point estimate of the interaction coefficient is estimated with modestly greater precision, but the overall significance of the inheritance variables is essentially unchanged.

15. As noted in Table 3, we represent age by a series of dichotomous variables. (The omitted category is individuals 74 years and older.) Alternative specifications in which age was entered as a logarithm or as a quadratic led to substantially the same results.

16. A chi-squared test of the hypothesis that the coefficients on log of inheritance and its interaction with lagged labor force participation are jointly equal to zero is 3.49 with two degrees of freedom, which is significant only at the 0.17 level.

17. Using a specification in which the size of the inheritance is entered in levels rather than logarithms, the point estimates of the coefficients have the same pattern. Also, the overall statistical significance of the inheritance variables is just as strong—the *p*-value is 0.01.

18. Recall that we only have the age of one spouse (the donee), and we cannot identify that spouse. Thus, if a relatively young donee is married to an elderly person, the family is categorized as being relatively young. If the elderly spouse retires from the labor force, the data would then suggest a misleading relation between age and labor force activity. On the other hand, to the extent that spouses are close in age, this problem may not be too severe. In any case, the age variables should be interpreted with caution.

19. The chi-squared test with three degrees of freedom is 12.23. When inheritance is entered in levels rather than logs, the joint significance level of the three coefficients is 0.0006.

20. The proportions of donees who are children are 0.14 and 0.21 in the single return and joint return samples, respectively.

21. For both joint and single returns, the other coefficients were essentially unchanged.

22. As Lumsdaine and Mitchell (1998) note, most of the empirical literature has examined retirement as a discrete outcome.

Table 1. Labor Force Transitions: Single Returns[a]

1982 \ 1985	0	1	
0	166 0.982 (0.0102)	3 0.018 0.0102	Inheritance < 25,000 N = 360
1	61 0.319 (0.0337)	130 0.681 (0.0337)	Mean Inheritance = $6,736 (5,683) Median Inheritance = $5,000 Mean Age = 71.3 (5.43)

1982 \ 1985	0	1	
0	102 0.981 (0.0135)	2 0.019 (0.0135)	$25,000 ≤ Inheritance ≤ $150,000 N = 191
1	41 0.471 (0.0535)	46 0.529 (0.0535)	Mean Inheritance = $69,519 (36,568) Median Inheritance = $58,815 Mean Age in 1985 = 70.5 (5.20)

1982 \ 1985	0	1	
0	85 0.955 (0.0220)	4 0.045 (0.0220)	$150,000 < Inheritance N = 152
1	26 0.413 (0.0620)	37 0.587 (0.0620)	Mean Inheritance = $389,538 (282,323) Median Inheritance = $294,415 Mean Age in 1985 = 69.1 (5.37)

[a]In each cell, the first figure is the number of observations in the cell; the second figure is the proportion of observations in the associated row that fall in the cell; and the figure in parentheses is the standard error of the proportion. Figures to the right of each matrix indicate the relevant inheritance range, the number of observations, the mean and median inheritance, and age. Where shown, numbers in parentheses are standard deviations.
Source: See text.

Table 2. Labor Force Transitions: Joint Returns[a]

1982 \ 1985	0	1	2	
0	130 0.963 (0.0163)	5 0.037 (0.0163)	0 -- --	Inheritance < 25,000 N =436
1	62 0.300 (0.0318)	132 0.638 (0.0334)	13 0.0628 (0.0169)	Mean Inheritance = $7,163 (6,257)
2	7 0.0745 (0.0271)	34 0.362 (0.0496)	53 0.564 (0.0512)	Median Inheritance = $5,000 Mean Age in 1985 = 69.3 (5.29)

1982 \ 1985	0	1	2	
0	107 0.930 (0.0237)	8 0.0696 (0.0237)	0 -- --	$25,000 ≤ Inheritance ≤ $150,000 N =344
1	61 0.355 (0.0365)	103 0.599 (0.0374)	8 0.0465 (0.0161)	Mean Inheritance = $73,545 (37,154)
2	4 0.0702 (0.0339)	21 0.368 (0.0639)	32 0.561 (0.0657)	Median Inheritance = $65,900 Mean Age in 1985 = 69.1 (5.04)

1982 \ 1985	0	1	2	
0	86 0.905 (0.0301)	9 0.0947 (0.0301)	0 -- --	$150,000 < Inheritance N =262
1	46 0.365 (0.0429)	73 0.579 (0.0140)	7 0.0556 (0.0204)	Mean Inheritance = $381,772 (254,070)
2	12 0.293 (0.0711)	16 0.390 (0.0762)	13 0.317 (0.0728)	Median Inheritance = $297,101 Mean Age in 1985 = 68.1 (4.91)

[a]See note in Table 1.

Table 3. Definitions of Variables and Summary Statistics[a]

Variable	Single Returns	Joint Returns
ln(INH)	10.66	10.35
(log inheritance)	(2.01)	(1.98)
LF82	0.485	---
(=1 if individual was in labor force in 1982)	(0.501)	---
AGE62-64	0.180	0.241
(= 1 if 62 $\leq$ age $\leq$ 64 in 1985)	(0.385)	(0.428)
AGE65-69	0.250	0.348
(= 1 if 65 $\leq$ age $\leq$ 69 in 1985)	(0.434)	(0.477)
AGE70-74	0.282	0.227
(= 1 if 70 $\leq$ age $\leq$ 74 in 1985)	(0.450)	(0.419)
ln(EARN82)	4.24	6.07
(= log earnings in 1982)	(4.56)	(4.70)
ln(DIV + INT)	8.49	8.67
(= log dividends plus interest)	(2.34)	(2.28)
DEPENDENTS	0.0593	0.157
(= number of dependents claimed on return in 1982)	(0.263)	(0.567)
LF1'82	---	0.485
(= 1 if one family member in labor force in 1982)	---	(0.500)
LF2'82	---	0.184
(=1 if two family members in labor force in 1982)	---	(0.388)
N	703	1,042

[a]Figures in parentheses are standard deviations.

Table 4. Logit Analysis of Transition to Retirement: Single Return[a]

Variable	(1)	(2)
ln(INH)	0.1548	0.1027
	(0.1774)	(0.1800)
LF82	7.076	5.821
	(2.027)	(2.113)
ln(INH)*LF82	-0.2832	-0.2691
	(0.1869)	(0.1893)
AGE62-64	---	0.7258
	---	(0.3533)
AGE65-69	---	1.014
	---	(0.3364)
AGE70-74	---	-0.1047
	---	(0.3378)
ln(EARN82)	---	0.09858
	---	(0.06316)
ln(DIV + INT)	---	-0.06009
	---	(0.04865)
DEPENDENTS	---	0.1981
	---	(0.4375)
Constant	-5.290	-4.561
	(1.936)	(1.987)
Observations	703	703
loglikelihood	-265.0	-253.0

[a]Numbers in parentheses are standard errors, variables are defined in Table 3. The dependent variable equals one if the individual was in the labor force in 1985 and zero otherwise.

Table 5. Ordered Logit Analysis of Transition to Retirement: Joint Return[a]

Variable	(1)	(2)
ln(INH)	0.1964	0.1991
	(0.1325)	(0.1349)
LF1'82	5.822	4.625
	(1.559)	(1.608)
LF2'82	9.847	8.501
	(1.669)	(1.719)
LF1'82*ln(INH)	-0.2346	-0.2365
	(0.1397)	(0.1416)
LF2'82*ln(INH)	-0.4024	-0.4115
	(0.1497)	(0.1520)
AGE62-64	---	0.2118
	---	(0.2501)
AGE65-69	---	0.09344
	---	(0.2078)
AGE70-74	---	-0.1244
	---	(0.2641)
ln(EARN82)	---	0.1255
	---	(0.03366)
ln(DIV + INT)	---	-0.04675
	---	(0.03155)
DEPENDENTS	---	0.02920
	---	(0.1230)
Constant	-4.810	-4.412
	(1.487)	(1.511)
Observations	1,042	1,042
loglikelihood	-694.1	-676.6

[a]Numbers in parentheses are standard errors, variables are defined in Table 3. The dependent variable measures the probabilities of having zero, one, or two earners in the family in 1985.

Table 6. Ordinary Least Squares Analysis of Earnings Change[a]

	Single Returns		Joint Returns	
Variable	(1)	(2)	(3)	(4)
Constant	-0.1164	-0.1241	0.0002493	-0.1869
	(0.3566)	(0.4050)	(0.3306)	(0.3847)
ln(INH)	-0.03698	-0.04785	-0.05183	-0.06128
	(0.03627)	(0.03986)	(0.03174)	(0.03375)
AGE62-64	---	0.3424	---	0.2550
	---	(0.2383)	---	(0.2372)
AGE65-69	---	0.04456	---	0.08332
	---	(0.2284)	---	(0.2279)
AGE70-74	---	0.0648	---	0.2898
	---	(0.2491)	---	(0.2617)
ln(DIV + INT)	---	-0.003409	---	0.01044
	---	(0.02692)	---	(0.02482)
DEPENDENTS	---	0.09164	---	0.1254
	---	(0.2473)	---	(0.08467)
$\bar{R}^2$	0.00021	-0.00215	0.00526	0.00695
Observations	186	186	314	314

[a]Numbers in parentheses are standard errors. The dependent variable is the percentage change in earnings between 1982 and 1985, conditional on the number of earners in the family being the same in both years. Variables are defined in Table 3.

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