What Happens When You Show Them the Money?:

Lump Sum Distributions, Retirement Income Security, and Public Policy

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ABSTRACT

We examine pre-retirement lump sum distributions from pension plans, which have grown significantly in recent years. Most LSD recipients do not rollover the funds into qualified accounts, but the likelihood of rollover rises for larger distributions. We find that tax penalties imposed in 1986 on non-rollovers by people younger than 55 raised the likelihood of rollovers among this group, but had less effect on the likelihood that such households saved the funds, where saving includes investing in taxable assets and paying off debt. Simple calculations indicate that cash-outs reduce annual retirement income by $1,000 to $3,000. These calculations almost surely overstate the pension loss. Nevertheless, pension loss may be quite important among the affected households, who are likely to have accumulated less retirement wealth than average.

I. Introduction

A major objective of public policy toward pensions is to ensure adequate retirement income for as many workers as possible. The best way to achieve this goal, however, is often uncertain. In this paper, we examine the role of one aspect of pension policy: the tax treatment of lump sum distributions that are taken from pension balances before a worker reaches retirement age. Upon changing jobs, many workers can choose between leaving their existing, vested pension balances in the pension plan they had been enrolled in, or taking the funds as a lump sum distribution (LSD). If taken as an LSD, the funds may be "rolled over" to another qualified plan (typically, either the defined contribution plan at the worker's new employer or an Individual Retirement Account), or may be cashed out and used for some other purpose.

Policy currently discourages workers from cashing out their pension balances before retirement age. Funds that are cashed out are subject to taxation as ordinary income, as are all pension benefits. In addition, the Tax Reform Act of 1986 required that funds that are cashed out are also subject to a 10 percent penalty tax depending on the worker's age. The penalty tax applies to workers up to age 59½ if the distribution is taken prior to job termination, and to workers up to age 55 if the distribution is taken as part of a job termination. Since 1993, the employer must assess a withholding tax of 20 percent on any cash distribution not transferred into a qualified account. Also, employers are required to offer departing employees the option of directly transferring lump sum and certain other distributions into another qualified retirement plan or IRA.

Despite these tax considerations, most workers who receive lump sum distributions cash out the funds, thus potentially sacrificing future retirement income in exchange for current expenditures. Lump sum distributions are sizable and have grown rapidly in recent years.

Moreover, a variety of trends, including the shift toward defined contribution plans--where LSDs are more prevalent--suggest that distributions will become even larger in the future. These facts, combined with projections of increased life spans and concerns about the adequacy of households' saving for retirement, raise a number of important positive and normative questions for researchers and policy makers. What is the impact of penalty and withholding taxes on rollover behavior, retirement wealth accumulation, and broader measures of saving? Do these effects differ across demographic groups who also vary in their preparation for retirement? Does the availability of early, albeit penalized, lump-sum distributions increase pension participation by making pensions more attractive to workers--because the money is portable and accessible for non-retirement purposes? How do LSD rules interact with withdrawal rules for other tax-preferred saving incentives? How should LSD rules be designed?

This paper explores some of these issues and is organized as follows. Section II reviews previous research findings, identifying consensus findings as well as gaps in the literature. Section III presents a simple model of how households might choose to dispose of lump sum distributions and develops the related empirical implications. In section IV, we review the data used in the subsequent empirical work. Section V discusses descriptive data and trends relating to the magnitude, growth, distribution and disposition of LSDs. Section VI presents our formal econometric analysis of rollover choices and studies the implications of changing the tax penalty. In section VII, we examine the implications of the data for the level and distribution of retirement income. Section VIII develops some of the broader ramifications of the findings and provides concluding comments.

Relative to previous work, the paper makes three main contributions. First, we develop an explicit model of the tax and non-tax determinants of LSD choices. Second, we model the tax

treatment of lump sum distributions since 1970. Thrid, we estimate the model and use the results to simulate the impact on rollover behavior of changing the tax treatment of LSDs in 1986. Fourth, we provide estimates of the implications of LSD choices for retirement income loss and broader measures of saving and wealth.

We find that, at a theoretical level, LSD choices can be plausibly related to major, standard demographic and economic variables. At an empirical level, the descriptive and econometric data provide support for the underlying model. The decision whether to rollover an LSD is economically and significantly influenced by the taxation of LSDs and in particular by the tax penalty. The impacts on retirement income loss are potentially large but are mitigated by several factors, including uses of the LSD that are not rollovers, but nevertheless represent saving in a broader sense. Even if the overall impacts of LSD cashouts on retirement income turn out to be small, however, our evidence suggests the possibility that the impact among those who cash out the funds could be significant.

II. Previous Research

The existing economic literature has examined in great detail the impacts on saving of *contributions* to pensions, 401(k)s and IRAs[1], but has spent much less time examining how different types of withdrawals from such plans affect saving and retirement income. The literature on LSDs has focused on two sets of questions: the patterns and determinants of the disposition of LSDs, and the effects on retirement income.

A. Disposition of LSDs

Previous analyses of the disposition of LSDs include Andrews (1991a), Chang (1996),

[1]For reviews of the literature, see Bernheim (1999), Engen, Gale and Scholz (1996), Gale (1998), and Poterba, Venti and Wise (1996).

Engelhardt (1999), Fernandez (1992), Hurd, Lillard and Panis(1998) , Korczyk (1996), Poterba, Venti, and Wise (1998), Sabelhaus and Weiner (1999), Scott and Shoven (1996), and Yakoboski (1997). The studies use a variety of data sets, but reach a common set of conclusions: The vast majority of people who receive lump sum distributions do not roll over the funds into qualified accounts. However, a much larger portion of dollars received are rolled over. Controlling for other factors, the likelihood that a worker will roll over the LSD rises with age, income, and the size of the distribution. There is some evidence that variables that may be proxies for financial sophistication or "tastes for saving"--such as education, interest income, and IRA ownership--increase the likelihood that distributions are rolled over (Andrews 1991a).

Despite the apparent robustness of most of these findings, there are at least two major gaps in the literature. First, there has been little formal modeling of LSD choices. Hurd, Lillard and Panis (1998) provide an interesting formal model of whether to annuitize or cash out LSDs that occur at retirement. This is related to our work, but Hurd et al focus on the annuitization choice rather than rollovers or saving more generally, and they focus on workers at retirement whereas we focus on pre-retirement LSDs. Chang (1996) estimates via a difference-in-difference approach that the tax changes introduced in 1986 raised the probability of rollovers by about 6 percentage points. However, as discussed below, we believe that the specification of tax rates on LSDs in Chang (1996) is flawed and substantially understates the change in effective tax rates on LSDs imposed by the 1986 tax act.

Second, much less attention has been paid to uses of LSDs that represent saving but that are not rollovers (Engelhardt 1999 is an exception). This could be an important issue, however, because funds that are not rolled over may nevertheless be saved. Thus, the impact of tax policy on rollovers and the determinants of rollover behavior may be interpreted differently, and may

lead to different policy conclusions, depending on whether the items that change rollover behavior also change broader measures of saving out of the LSD.

B. Retirement income loss

A key question concerns the extent to which LSDs in general and funds that are not rolled over in particular reduce retirement wealth accumulation. The typical procedure to measure this effect is simple: the amount of the cashed-out distribution is multiplied by $(1+r)^N$, where N is the difference between some target retirement age and the age at which the distribution was received and r is the rate of return on the investment. Engelhardt (1999), using the HRS, finds that for the median household receiving a lump sum distribution, the lost accumulation is between about 8 and 11 percent of social security and pension wealth. If social security and pensions account for three-quarters of retirement income for a typical elderly household, Engelhardt's finding would suggest that pension loss from cashed-in LSDs reduces retirement consumption by about 6-8 percent.[2]

Gustman and Steinmeier (1998), using the same data set, find that the average respondent has given up about $7,000 of pension benefits that were either received as cash settlements or were forfeited. Poterba, Venti and Wise (1999) estimate that interactions between job changes and the disposition of LSDs will reduce 401(k) balances at retirement for cohorts retiring in 2025 or 2035 by about 5 percent. Sabelhaus and Weiner (1999) show that distributions that are not rolled over average about 1 percent of adjusted gross income in most income classes. This figure includes the adjusted gross income of all households, not just those that received distributions.

These figures generally suggest small to moderate effects of LSDs on overall, average

[2]About one-sixth of elderly households depend on social security alone for all of their income, and about two-thirds depend on social security alone for half or more of their income (Aaron and Reischauer 1998).

retirement income. But the figures could either overstate or understate the actual effects. They may overstate retirement income loss because of non-rollover uses of LSDs that nevertheless represent saving. They may understate the *importance* (as opposed to the magnitude) of the resulting retirement income loss because both theory and evidence presented below suggest that households with low saving and households for whom pensions are most likely to represent additional saving are also the most likely to cash out their LSDs.

III. Modeling the Disposition of Lump Sum Distributions

In principle, LSD choices are nested in a long and complex set of decisions (Andrews 1991a). Employers must decide to offer a pension. The worker must decide to take a job and participate in a pension plan. The worker must stay with the firm long enough to become vested. The worker must then change jobs, voluntarily or by imposition, and have a choice of whether to take a LSD if it is available, unless the LSD is forced by the firm. Finally, workers who choose LSDs must decide on the disposition of the funds.

If the separation is driven by the firm's choices, the choice of whether to receive an LSD may not be up to the employee. If the worker's separation is voluntary, then the decision about whether to receive an LSD may be more likely to be based on worker preferences. In addition, the worker's decision to leave a firm could be based in part on the availability of a LSD (Ippolito 1998). This would suggest that workers who leave in voluntary departures might be more likely to consume the funds; however, having to leave a firm on an involuntary basis could lead to a fall in income and so lead to an increased propensity to consume the funds.

Despite these considerations, we take a more narrow approach to examining lump sum distributions. We model the disposition of the LSD. We do this both for data reasons and to

focus on the determinants of LSD disposition and the impact on retirement saving. In principle, this could induce sample selection bias, but others have looked at whether modeling the decision to accept an LSD affects subsequent levels of analysis and have found that it does not (Andrews 1991a and Chang 1996).

A. A Simple Intuitive Model of Rollover Decisions

A simple intuitive model illustrates the incentives created by allowing early withdrawals and how people might respond. Suppose a worker is seeking to determine the best way to finance a given consumption expenditure. She could finance the expenditure by taking a $1.00 distribution from her pension, which yields $(1-\tau_0-\pi)$, where τ_0 is her current marginal income tax rate and π is the penalty rate on early withdrawals. Her alternative would be to withdraw $(1-\tau_0-\pi)$ from a taxable saving account or to borrow the same amount. Suppose her pension pays a return of r_p and the after-tax opportunity cost of funds (i.e., the interest rate on saving and borrowing) is at rate r. Then the cost, in terms of retirement consumption assumed to be N periods hence, of tapping the pension is $(1+r_p)^N(1-\tau_N)$, where τ_N is the income tax rate in retirement. The cost of using another source of funds (cash reserves or borrowing) is $(1+r)^N(1-\tau_0-\pi)$. The ultimate gain (+) or loss (-) from cashing in a lump-sum payment per dollar is G, which is defined as the difference,

$$(1) \qquad G \equiv (1+r)^N(1-\tau_0-\pi) - (1+r_p)^N(1-\tau_N).$$

The break-even after-tax opportunity cost, r^*, is found by setting G=0.

$$(2) \qquad r^* \equiv (1+r_p)\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right)^{1/N} - 1.$$

If the taxpayer's cheapest source of funds has an after-tax rate of interest (r) less than r^*, she is better off using that than tapping into retirement funds. Notice that r^* increases with the current tax rate (τ_0) and the penalty rate (π) and decreases with the tax rate expected in retirement (τ_N). Tax considerations become less important when N is large—that is, if the taxpayer is young. As N grows, the ratio tends toward 1.0. Also note that r is an after-tax rate, whereas r_p is a pre-tax rate, which implies that $r^*>r$ for most taxpayers. For example, taxpayers who can borrow against their homes and deduct the interest, or use cash reserves on which the return would otherwise be taxable, are likely to have $r<r^*$. In other words, they are unlikely to spend their lump-sum distributions.

Workers with large amounts of other assets will typically have access to lower costs of funds, because they have some assets in fully taxable accounts and/or because their strong asset position makes them a good credit risk and thus lowers the interest rate they must pay to borrow. The simple model suggests that such people would typically not cash out their pensions early due to the high marginal tax and penalty they would face. For example, for someone in the 28-percent tax bracket whose pension assets earn 10 percent and who expects to retire in 20 years, her non-pension assets would have to earn more than 15 percent (pre-tax) to make it worthwhile to cash out or borrow against her pension. (See Figure 1.) If she is closer to age 55 (or age 60 if the distribution is not part of a termination), the disincentive to taking a cash-out is even greater, because recouping the 10 percent penalty becomes more difficult. Someone who terminates employment at age 54 and is in the 36 percent tax bracket would have to earn more than 18 percent on alternative investments to make a cash-out pay off. Thus, rational people with substantial non-pension assets are unlikely to cash out lump-sum payments.

Thus, theory indicates that people whose saving is most likely to be affected by pension tax incentives are also the most likely to cash out. These are persons who do not have liquid non-pension assets and face very high after-tax interest rates on borrowing since the tax code does not allow a deduction for consumer interest (such as on credit cards and car loans). Moreover, younger people, who are most likely to have low incomes and less access to credit, are least affected by the penalty on early withdrawals. Such people are more likely to face higher tax rates in retirement than when they receive a distribution, which further reduces their gain from keeping the money in a retirement account.

Under an alternative view of pension behavior (Shefrin and Thaler 1992), if pension saving is attractive to people because of the constraints on withdrawals, anything that makes it easier to tap pension saving makes it more like other saving, and thus a less effective means of stimulating saving.

Of course, new pension contributions might be encouraged by lax rules on early distributions. Employees might be more inclined to participate in company pension plans if they know that they can tap the money relatively easily. Yet, relaxing the rules on old pension savings would clearly reduce the pool of savings available for retirement.

B. Why do some people cash out only part of their pension?

The simple model would predict that people would almost always either cash out their pensions or roll over the entire balance. It would only be rational to roll over part when G=0, i.e., when r exactly equals r*, an event that is likely to be rare. Someone in that unusual situation would be indifferent between rolling over and withdrawing the entire amount, so it is unclear

what he or she would choose to do. In fact, some people do choose to withdraw only a portion of their distributions and roll over the rest. Moreover, people are more likely to withdraw only a portion if the distribution is large. For example, the mean LSD for workers who rolled over part of the distribution was $25,889 in 1993, based on the CPS data reported below. In comparison, the mean LSD for full rollovers was $20,618 and for non-rollovers was $7,620.

A possible explanation of partial cash-outs lies in the fact that the opportunity cost, *r*, is not actually constant. An optimizing consumer would finance expenditures from the least expensive sources first, and tap into more expensive sources when the cheaper sources are exhausted. For example, withdrawals from passbook savings accounts are a cheaper source of funds than home equity loans. Unsecured credit cards typically charge high interest rates, and the interest is nondeductible, making that a very expensive source of funds. Thus, if the first dollar withdrawn from the pension substitutes for the most expensive source of funds, with additional amounts replacing progressively less expensive sources, then *r* will be a decreasing function of the amount of money withdrawn. Another way of making the point is that if an individual were financing a large expense, they would substitute an LSD payment for their most expensive source of alternative funding.

Figure 2 illustrates the model with *r* variable for three different cases. The figure assumes that the individual has access to a lump-sum distribution of size *L*, and can roll over some, all, or none of it. The cost of withdrawing part of the distribution, rather than rolling it over, is *r**, per dollar withdrawn.

The top line on Figure 2, labeled "roll over none," corresponds to a consumer who faces very high interest rates. Even if she withdrew the entire amount of the lump-sum distribution, *L*, her opportunity cost of funds, *r*, would exceed *r**, the break-even point between cashing out and

using other sources of funding. In contrast, the line on the bottom, labeled "roll over all," represents someone who has available low-cost funds (for example, from a savings account). Even the first dollar of internal financing is less costly than withdrawing money from the pension. The intermediate case, labeled "roll some," shows the situation when it would make sense to roll over part of a distribution. If none of the distribution were rolled over, the opportunity cost of funds, r, exceeds r^*, which is inconsistent with rational behavior. On the other hand, if the entire distribution were withdrawn, r would be less than r^*, another inconsistency. An optimizing consumer in this situation would withdraw an amount, X, that equates r with r^*, and roll over the remainder, L-X.

The intuitive model, generalized so that r varies with the amount of withdrawal, may be summarized as follows:

	Roll over none (withdraw all)	if	$r(L)>r^*$
(3)	Roll over some (withdraw some)	if	$r(L)<r^*$ and $r(0)>r^*$
	Roll over all (withdraw none)	if	$r(0)<r^*$

This expanded model implies that the likelihood of a rollover depends on the size of the distribution. In the example just analyzed, the person who rolled over only part of the distribution (the intermediate case), would not have rolled over anything if the distribution were smaller than the amount she cashed out. The person who rolled over none of her distribution might have rolled over a portion of the distribution if it were big enough (i.e., if L were larger).

Stepping outside the model, an alternative reason why someone with a larger LSD might be more likely to rollover funds is that those with larger LSDs may have higher propensities to save. In the empirical work below, we attempt to distinguish these two explanations by controlling for indicators of tastes for saving, such as interest and dividend income.

Table 1 provides a summary of the empirical predictions that arise from the simple model.

C. Empirical Model of Rollover Behavior

With some convenient assumptions about functional form, the simple model of rollover decisions may be adapted to the data on rollovers. Substituting for r^* from Equation (2) into expression (3) yields the conditions underlying the three options. The expression for r^* may be transformed as follows:

$$\ln(1+r^*) = \ln(1+r_p) + \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right). \tag{4}$$

Then, expression (3) may be written as:

(5)

Roll over none if $\ln(1+r(L)) > \ln(1+r_p) + \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right)$

Roll over some if $\ln(1+r(L)) < \ln(1+r_p) + \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right)$ and

$$\ln(1+r(0)) > \ln(1+r_p) + \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right)$$

Roll over all if $\ln(1+r(0)) < \ln(1+r_p) + \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right)$.

D. Probit Model With r Fixed

The unobserved variables in expression (5) are the (pre-tax) rate of return on the pension asset, r_p, and the opportunity cost function, $r(\cdot)$. If r is a constant (i.e., $r(L)=r(0)=r$), then (5) may be written as a simple probit (or logit) model. To see this, define W as the difference between $\ln(1+r)$ and $\ln(1+r_p)$, i.e.,

(6) $W \equiv \ln(1+r) - \ln(1+r_p)$

Suppose that *W* may be expressed as a linear function of demographic variables, indicators of wealth, etc.:

(7) $W = Z\beta + \varepsilon$,

where *Z* is the vector of independent variables, and ε is a random normal variate with mean 0 and variance σ^{2}.

Then, substituting (7) into (6), and (6) into (5)—recalling that *r* is being held fixed for the moment—(5) can be rewritten as follows:

(8) Roll over none if $Z\beta + \varepsilon > \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right)$

Roll over all if $Z\beta + \varepsilon < \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right)$.

Dividing through by σ, the variance of ε, (8) can be transformed into a simple probit. The probability that the distribution is rolled over is $P \equiv \Phi\left[\frac{1}{\sigma}\frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right) - Z\frac{\beta}{\sigma}\right]$, where $\Phi(\cdot)$ is the normal distribution function. The probability that it is not rolled over is 1-P. Defining a new vector, $\tilde{Z} \equiv \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right)\Bigg| Z$, a simple probit of rollover status on $\tilde{Z}$ would provide consistent estimates of $\tilde{\beta} \equiv \left(\frac{1}{\sigma} \quad \frac{-\beta}{\sigma}\right)$, under the assumptions of the model.

E. Maximum Likelihood Model With r Variable

The full model may be estimated by maximum likelihood. Assume that

(9) $1 + r(L) = \frac{1+r(0)}{(L+1)^{\alpha}}$, where $\alpha \geq 0$.

Note that equation (9) allows for the case where r is a constant (α=0), is non-increasing in L, and satisfies the constraint that $r(L)=r(0)$ when L=0. Taking the log of both sides of (9) yields,

(10) $$\ln(1+r(L)) = \ln(1+r(0)) - \alpha \ln(L+1).$$

The probit may be extended to this case by redefining W as

(11) $$W \equiv \ln(1+r(0)) - \ln(1+r_p) = Z\beta + \varepsilon\,.$$

The condition for rolling over the entire LSD remains the same as in the case where r was fixed:

(12) $$\varepsilon < \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right) - Z\beta$$

The condition for rolling over none of the LSD is that

(13) $$\text{W - } \alpha \ln(1+L) > \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right),$$

which can be written as

(14) $$\varepsilon > \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right) + \alpha \ln(1+L) - Z\beta$$

A part of the LSD will be rolled over when neither (12) nor (14) holds. As in the probit model, this problem can be transformed in terms of a standard normal error (mean 0, variance 1). Thus, the likelihood function is,

(15) $$\prod_{\substack{roll\\all}} \Phi\left(\tilde{Z}\tilde{\beta}\right) \times \prod_{\substack{roll\\some}} \left[\Phi\left(\tilde{Z}\tilde{\beta} + \frac{\alpha}{\sigma}\ln(1+L)\right) - \Phi\left(\tilde{Z}\tilde{\beta}\right)\right] \times \prod_{\substack{roll\\none}} \left[1 - \Phi\left(\tilde{Z}\tilde{\beta} + \frac{\alpha}{\sigma}\ln(1+L)\right)\right],$$

where each of the products, Π, refers to the product of the likelihoods for each type of observation. Note that, if L were a constant, expression (15) would be the likelihood underlying

an ordered probit. The variant where L is different for each taxpayer may be estimated by general maximization techniques. Maximization of expression (15) should produce consistent estimates of $1/\sigma$, $-\beta/\sigma$, and α/σ, under the assumptions of the model.

IV. Data

To examine these issues empirically, we use data from the Employee Benefits Supplements to the Current Population Survey in 1988 and 1993.[3] The questionnaire was administered to a representative subsample of about 25,000 individuals in each year. Both current workers and nonworkers were included, although nonworkers were only interviewed in 1993 if they were between 25 and 64 years of age.

A. Information on Lump Sum Distributions

The CPS asks current workers covered by a pension by their current employer if they would be eligible for a LSD from their most important pension plan should they leave their present job. This question refers only to the worker's primary plan.

The CPS also asks current workers and those who have had at least 2 consecutive weeks of full-time employment who have had pension coverage on a previous job if they ever received an LSD from a previous job. If they did, the survey then asks when it was received, how much it was, and how the person used it, where the respondent can pick numerous uses. The LSD amount was top-coded at $100,000, but very few people were at the limit. We deleted one observation with an extraordinarily large reported distribution that we felt was likely to be a

[3]The 1983 EBS to the CPS also contains information on LSDs but does not contain information on the year the LSD was received, which make the data difficult to use for our purposes.

flawed data item. For the analysis below, we converted the LSD amount to 1993 dollars using the CPI-U index.

The CPS contains detailed data on the reported uses of distributions. Although the list of uses varied slightly across the 1988 and 1993 samples, we collapsed the two lists into what we believe are consistent and meaningful categories. Specifically, we define a narrow measure of saving to allow for rolling the funds into an IRA or purchasing an annuity. We refer to either of these as a rollover and note that both are tax-preferred relative to any other use of the funds. Our intermediate definition of saving also allows funds to be invested in other ways, or used to buy a business or a home. Our broad measure of saving includes debt repayment in addition to the intermediate definition. Although the CPS did not ask how much money was put into each use, very few respondents indicated using the LSD for more than one purpose. We divided the total LSD amount equally among all stated uses.

B. Tax rates and other data

The CPS also contains significant amounts of demographic and economic information. To gather additional data, we matched the Employee Benefit Supplement to the March, 1993 and the March, 1988 CPS. With the matched data set, we have information on the respondent's current age, education level, marital status, homeowner status, number of children, gender, job market status, race, industry of employment, occupation, pension coverage at current job, IRA participation, 401(k) eligibility and participation, and other items. The CPS also provides information on the level and composition of income. This includes income from wages and salary, earnings from a business or farm, self-employment income, self-employment business earnings, farm self-employment earnings, survivor's benefits, retirement income, interest income, dividend income, alimony income, and an other income variable whose source could be private

pension, interest, dividends, rent, estate or trusts, worker's compensation, annuities or insurance policy.

Calculating the appropriate tax rate on LSDs is both crucial and difficult. Pre-ERISA, LSDs were taxed as long-term capital gains. ERISA differentiated the tax treatment of LSDs depending on whether the funds were deemed to have accrued pre- or post-1974 and whether the employee had had at least 5 years of job tenure when the LSD occured. The pre-1974 amount could be treated as capital gains, or it could be treated as ordinary income. The post-73 portion was treated as ordinary income. If the employee had been in the plan for 5 years prior to disposition, all of the ordinary income could be subjected to 10-year income averaging. A nice feature of the income averaging is that it uses the tax schedule for single taxpayers, so to determine the tax rate all we need to know is the LSD amount and the year, rather than anything about the taxpayer's income or deductions or filing status. Given what we do know in the CPS (the amount of the LSD and the year it was recieved) and what we don't know (the recipient's individual or family income, deductions, filing status or marginal tax rate in the year of the LSD, job tenure, or allocation of funds between pre- and post-74 periods), we calculate the tax rate on LSDs assuming that all taxpayers take the special 10-year averaging rule to determine the MTR.

This procedure for pre-TRA-1986 tax rates is justified if two conditions hold: namely, that the LSDs reported in the CPS were based on job tenures of 5 years or more, and if in fact income averaging was preferable to taxation as ordinary income. To gauge whether the LSDs reported in the CPS are typically for jobs held 5 years or more, we compare data on the number and magnitude of LSDs in the HRS and the CPS. In the HRS, LSD questions are only asked if the employee has been at the job for 5 years or more. Thus, if the CPS is capturing many LSDs from shorter job tenure, there should be more LSDs reported in the CPS and they should be

smaller in size. Appendix table 1 reports such data and shows that both the number and magnitude of LSDs in the HRS and CPS are similar, for the same age cohorts (when the HRS data are top coded to match the CPS top codes). To test the second assumption, we examined taxpayers at different times (1975, 1980,and 1986) income levels (half-median, median and twice median income), different LSD sizes (from $500 to $100,000), different filing status (singles and married filing jointly) and different ages (25, 35, 45, 55 and 65). For virtually every situation modelled, 10-year averaging was preferable to taxing some of the funds as ordinary income and the rest as capital gains. Thus, the tests above suggest that our procedure for calculating pre-1987 tax rates is justified.

TRA 86 generated two new sets of rules for taxation of LSDs, depending on the person's age as of January 1, 1986. Those younger than 50 on January 1, 1986 would have their LSDs taxed as ordinary income. For these households, we "back-cast" income using aggregate personal income growth rates between the year when the LSD was received and the 1993 CPS. People who were 50 or older on January 1, 1986--and had been in the plan for less than 5 years had their LSDs taxed as ordinary income. Those over 50 who had been in the plan for 5 or more years had a number of options involving 5-year averaging (using current year tax schedule for singles) or 10-year income averaging (using the 1986 tax schedule for singles) and the division of the taxable LSD between the pre-74 portion, which would be taxed at a flat 20 percent rate, and ordinary income--subject to either averaging mehtod noted above. Notably, for these households, we can calculate the tax rate without reference to income, deductions or filing status. Of course, TRA 86 also established penalties for withdrawals under several sets of circumstances.

D. Assessment of the CPS data

A significant advantage of the CPS data on LSDs is the ability to examine distributions

over many age groups, years, and different tax regimes. Nevertheless, several caveats to the use of the data should be kept in mind. First, respondents' answers must be taken with a grain of salt, since the question "what did you do with the money" is difficult to answer once it is recognized that money is fungible. Nevertheless, we take the survey response as a reasonable guide to how the distribution affected the household's saving and consumption and note that the plausibility of the empirical findings supports this notion.

Second, workers who leave jobs with pensions have the option of cashing in the funds or rolling them over, but also have the option of leaving the funds in the already existing pension at their former employer. Choosing the latter option would not trigger a lump sum distribution response in the CPS, but may well be equivalent to a rollover for tax, retirement security and public policy purposes.[4] Hurd et al (1998), using data from the HRS, find that a large proportion of workers indicate that they left their pensions at their previous employer when changing jobs. If this holds for the CPS sample as well, then the CPS data will overstate the likelihood that workers cash in their pension balances when leaving their jobs and will overstate the proportion of funds that are cashed in, but it will not overstate retirement income loss of those that do cash in their funds. However, Engelhardt's (1999) study of the HRS sample appears to indicate that only 10 percent of respondents fall into this category, and a survey cited in Chang (1992) suggests that only about 17 percent of pension recipients are affected.

Third, all survey data can suffer from recall bias: distributions that occurred in the past

[4]The latter option may not prove equivalent if the money is left in a defined benefit plan whose real benefits are eroded by inflation.

may not be recalled well by respondents, and respondents may not report every event that might be considered an LSD. As a result, there appears to be significant under-reporting of LSD aggregates in the survey-based data. (The underreporting of aggregates could also be aggravated by top coding in the surveys.) Based on the CPS, we find that LSDs totaled about $20 billion in 1992, with 1.5 million workers receiving an average LSD of about $13,900. Alternative estimates, using a variety of data sources including tax records, place the total at about $75-80 billion (Sabelhaus and Weiner 1999, Woods 1996, Yakoboski 1997). Thus, the CPS may understate the aggregate dollar volume of LSDs by as much as 70 percent. Nevertheless, Sabelhaus and Weiner (1999) note that the patterns of LSD disposition with respect to age and income appear to be similar in the tax data and the survey data.

Fourth, it may be suspected that LSDs that occur in conjunction with involuntary job changes may be used differently than those associated with quits. Chang (1996), using CPS data, has shown that only about 10 percent of the LSDs received in 1987 were due to layoffs or job terminations; the rest were associated with voluntary job changes. Engelhardt (1999), using HRS data, also finds that only a small portion of LSDs are associated with involuntary job changes, and shows that the disposition of LSDs is significantly different than LSDs associated with voluntary job changes.

V. Descriptive Results

A. Magnitude and Growth of LSDs

The CPS data indicate that the prevalence of LSDs increased significantly between 1988 and 1993. During this period, the number of CPS respondents who had received LSDs rose by over 60 percent, and the average real LSD received--among recipients--rose by almost 40 percent. Thus, reported total distributions received more than doubled between 1988 and 1993

based on these surveys.

The proportion of workers with pensions who said they would be eligible for a lump-sum distribution if they left their current job was 56 percent in 1988, compared to 68 percent by 1993. These estimates exclude the 16 to 18 percent of workers who did not know whether they would be eligible, which may explain some of the differences with LSD eligibility rates reported in other studies.[5]

B. Eligibility for LSDs at current job

Tables 2 and 3 show LSD eligibility patterns among workers who have pensions in the 1993 CPS. (Appendix Tables 2 and 3 report similar data for the 1983 and 1988 CPS.) The availability of an LSD is higher for managers, sales and technical workers, clerical workers, workers with family income of more than $10,000, and workers with at least a high-school education. There is no significant pattern of LSD availability with respect to age, race, gender or coverage under a union contract. Controlling for other factors, however, union members are substantially less likely to be eligible for LSDs.

LSD eligibility rates are higher in DC than in DB plans, but both rates have increased over time. In 1988, the first year for which a breakdown was available, 50 percent of the DB participants and 63 percent of the DC participants report being eligible for an LSD upon termination. Just five years later, 58 percent of the DB participants and 79 percent of the DC

[5]Scott and Shoven (1996) report that 87 percent of participants in DC plans and 64 percent of those with DB plans had the option of taking a lump-sum distribution in 1993. See Fernandez (1992) for data from earlier years.

participants said they could cash out their pensions upon leaving their job. Over the same period, according to the CPS, employees with DC pensions rose from 44 percent to 60 percent.

Another significant factor affecting lump-sum distribution eligibility is the employee's industry. Controlling for other factors, the service industry is much more likely to offer lump-sum distributions than other industries. Workers in trade, finance, insurance and real estate are least likely to be eligible for a lump-sum distributions, all else equal.

C. Disposition of LSDs

Tables 4 and 5 present evidence on empirical patterns of LSD disposition. Table 4 examines the proportion of recipients who roll over their accounts. A small proportion of LSD recipients rolled over the entire distribution: 20 percent in the 1993 CPS and 11 percent in the 1988 data. More than three quarters of respondents in each year indicate that they cashed out the entire distribution. The likelihood of rollover rises with age and income and, since 1970, appears to be rising over time as well. These relations are generally stronger in the 1993 CPS than in the 1988 data.

Table 5 shows that the proportion of funds that are rolled over is significantly higher than the percentage of workers who roll over the funds. This occurs because large distributions are more likely to be rolled over, a result cited widely in the previous literature. Thus, in the 1993 CPS, 43 percent of LSD funds were rolled over, even though only 20 percent of recipients rolled over their distribution. The proportion of funds rolled over rises with income, age and the year when received, since 1970. As in table 4, the results in table 5 are more pronounced in the 1993 data than in the 1988 survey.

It is worth recalling, however, that the CPS data do not include workers who chose to leave their pensions with previous employers. Thus, the data in tables 4 and 5 overstate the

proportion of workers leaving jobs who cash in their pension benefits and the proportion of such funds that are cashed in.

Table 6 examines a broader list of uses of lump-sum distributions, based on the 1993 CPS. As noted, the proportion of recipients that roll over and the proportion of funds rolled over rises with the age of the recipient. Many of the other uses of LSDs, however, also contribute to saving, at least in the short run. A relatively small percentage of people over 55 rolled over their LSDs into an annuity. A significant percentage of people "invested in other ways" a slightly smaller percentage of dollars. Between 14 and 22 percent of people under age 60 made such investments, accounting for 14 percent of the dollars distributed. About the same percentage was invested in businesses or homes. Young people (under 35) were much more likely than others to use their money to pay off debts. Nearly a quarter of those under 25 spent their LSDs this way, accounting for 28 percent of their distributions.

Congress has allowed penalty-free withdrawals from IRAs to pay for medical and educational expenses or the purchase of a home. Of these, home purchase was the largest use of distributions. Medical and educational expenses amounted to no more than 3.8 percent of distributions for any age category. These expenses were only 2 percent of distributions overall.

Finally, a substantial portion of the money was simply spent, especially by younger people. Those under 25 spent nearly half of their distributions on "everyday expenses," "consumer items," or "other." Individuals age 25 to 34 spent over 20 percent of their distributions.

The data from 1988 show similar patterns with an important difference. (See Table 7.) In 1988, survey respondents were asked if they spent all or a portion of their LSDs on unemployment-related expenses. This is a natural question, since most LSDs are received upon

termination of employment (either voluntary or involuntary). People aged 35 to 54 reported a nontrivial percentage of their LSDs going to such expenses, ranging from 6.5 percent for 45 to 49 year olds to 3.4 percent for 50 to 54 year olds.

Table 8 shows some suggestive evidence on the effect of enacting in 1986 the ten-percent penalty on early withdrawals from pensions. The percentage of money rolled over by people who would be subject to the penalty (under 55 years of age) doubled between 1986 and 1987, and is higher in every year after 1986 than it was before. The data from the 1988 CPS show a much smaller increase in 1987. The amount that is used for investments or to pay off debts falls somewhat and the amount spent or consumed, falls significantly. These data suggest that the tax law change had a significant impact.

Table 9 collapses the detailed data above into a summary of the different LSD uses as related to the age of the recipient and the year when the LSD was received, using data from the 1993 CPS. The probability of rollover increased by 10 percentage points for households aged 25-54 from 1981-86 to 1987-93. In contrast, the probability of rollover actually fell slightly after 1986, for households aged 55 and older, who were not subject to the 10 percent penalty imposed in 1986. The proportion of funds rolled over suggests an even larger impact of the 1986 tax changes. For households aged 25-54, the proportion of funds rolled over nearly doubled, rising from 25 percent to 44 percent. For older households, the proportion fell by 17 percentage points. These findings correspond roughly to changes in the tax rate facing LSDs, which rose for 25-54 year olds after 1986, due to the penalty, and fell for the households 55 and older, presumably due to the effects of the tax reform act of 1986.

Trends using the broadest definition of saving, however, appear to be significantly different. For young households, the proportion of recipients saving the LSD, in the broadest

sense, rose by less than 2 percentage points, while for older households the proportion of recipients saving the funds fell by 2 percentage points. Thus, of the 12 percentage point relative change in the proportion of young recipients rolling over funds compared to older recipients rolling over funds after 1986, only 4 percentage points of that change showed up as relative changes in the likelihood of broader saving measures.

Similarly, the proportion of LSD funds saved, using the broad measure, rose by 8 percentage points for younger households after 1986 and fell by 10 percentage points for older households. Thus, of the 37 percentage point relative change in the proportion of funds rolled over by young recipients compared to older recipients after 1986, about 18 percentage points showed up as relative changes in the proportion of funds saved.

Overall, we view the descriptive results presented in this section as both plausible and strongly consistent with the underlying framework presented in section III. People are more likely to spend their distributions if they are young, perhaps because the lost tax benefits are heavily discounted. Young people are also likely to be liquidity constrained-that is, they face high alternative sources of borrowing. These people normally use distributions to finance investments, debt reduction, or home purchases. LSD choices appear to have changed in response to shifts in their tax treatment. The findings are also consistent with the view that the 1986 tax changes raised rollover probabilities, but had less of an impact on the overall probability that LSDs were used for some sort of saving. Thus, while firm conclusions at this stage would be premature, the data point to some interesting hypotheses to confront with formal tests.

VI. Regression and Simulation Results

The regression analysis is motivated by the theoretical model presented in section III and the descriptive data presented in section V. We first examine--in a series of probit models--the impact of tax and non-tax factors on the rollover decision, using estimates of r* as well as simpler measures of the impact of taxes. Next, we turn to maximum likelihood estimates of the allocation of lump sum distributions. These estimates take into account multiple uses of the LSD and examine the dollar amount given to each, whereas the probits examine only a (0,1) decision. The third set of estimates returns to the probit framework, but examines the impact of tax and non-tax factors on broad measures of saving out of the LSD, whereas the first set of estimates looks only at the rollover decision.

All of the results reported in tables 10-14 are based on the 1993 CPS. Analogous findings using the 1988 CPS are presented in appendix tables 4-7. To be included in the sample used for the regressions, respondents must have received a LSD in 1970 or later years, must have been 25 or older when they received the LSD, and must have provided usable information on all the variables used in the regressions. These restrictions generated a 1993 CPS sample of 1,999 recipients and a 1988 sample containing 1,291 recipients.

A. Variable Definitions

The equations employ several variables that have not been described to this point. Indicators for education track whether the respondent had less than 12, 12, 13-15, 16, or more than 16 years of education, with less than 12 being the omitted group in the regression. LSD recipients are divided into income quintiles, and interest and dividend income quintiles, based on the 5-year age group (25-29, 30-34, etc.) to which they belong, with the lowest quintile being the omitted category in each case. Real LSD size (1993 dollars) is divided into 4 categories: less than $1,000, between $1,000 and $5,000, between $5,000 and $10,000, and more than $10,000,

with less than $1,000 as the omitted category. The income tax rate that applies when the LSD was received, the LSD tax rate that applied then, and the income tax that applies at retirement are described in section IV. The variable r* is calculated using those variables, current age, and the assumption that retirement occurs at age 65. For households who received their LSD over the age of 65, r* is set to zero.

A. Probit Analysis of Rollover Decisions

Tables 10-12 present our probit analysis of rollover decisions. Table 10 presents four basic probit regressions. In the first, in the upper left corner, we present a very basic specification that focuses on demographic and economic variables and excludes tax factors. We find that increased education is generally positively correlated with an increased likelihood of rolling over the funds in an LSD, but the relation is only statistically significantly for one group. The likelihood of rolling over the funds is significantly higher for households in the top age-adjusted income quintiles. The probability also rises with the age of recipient at the time of the LSD and rises sharply with the size of the LSD. All of these are standard results that have been obtained in previous work, as described in section II.

The second specification, in the bottom left corner, adds to the basic specification three additional variables suggested by the theoretical model. The model predicts that households with more interest and dividend income would have access to cheaper sources of funds--namely, reducing their taxable assets--than other households would and would therefore be more likely to rollover the LSD. Likewise, homeowners have access to home equity loans with net interest rates that are low because the house is good collateral and the interest payments are tax-deductible. Thus, homeowners should be more likely to rollover their funds as well. Finally, there is some evidence that minorities are more likely to be borrowing constrained (Jappelli

1990). The model suggests that such households would be less likely to rollover their LSD. As shown in the table, the first two theoretical effects are found in the data, and the impacts appear to be fairly large. For example, non-white households, controlling for all other factors, are 9 percentage points more likely to cash out their LSD than whites. The impact of homeownership is positive, but in this specification is not significant.

The two regressions on the right side of table 10 mirror the two on the left but add r* as an explanatory variable. The results show that r* enters with a strong and positive effect on rollover choices, as expected. Households with higher r* are more likely to rollover funds because the relative cost of doing so is lower for them. The results suggest that tax policy operating through r* can have powerful effects on rollover choices.

However, the variable r* is a complicated amalgam of several items, many of which are measured imprecisely. Thus, to obtain better intuition about the source of the impact of tax policy, in tables 11 and 12, we examine the impact of some simpler tax variables. These results in no way contradict the findings regarding the importance of r*. Rather the goal is to shed light on which components of r* are making a difference.

In table 11, we use the two basic demographic specifications and a variety of formulations of the tax rate on LSDs. The basic demographic variables had about the same effect as in table 10 are thus omitted from table 11. The specifications on the left show that including the variable LSDtax (the tax rate on LSDs, which is the sum of the income tax rate and any penalty that applies) provides a large and significant impact on rollover behavior. The middle specifications shows that breaking the variable out into pre-1987 and post-1986 components implies that the entire impact is due to the post-1986 era. In the estimates on the right, we use the income tax rate and a set of variables that interact age when the LSD was received (25-34,

35-44, 45,54, 55+) and the year when the LSD was received (up to 1986 and 1987 or later). These estimates suggest that the income tax rate itself is not a particularly important determinant of LSD choices, controlling for other factors. Rather, all of the impact of the tax variable is coming from groups under age 55 in the post-86 period. Households aged 25-34 were about 16 percentage points more likely to rollover their LSD after 1986 than before, controlling for other factors. Households aged 35-44 were 13 percentage points more likely to rollover their funds after 1986 than before. These, of course, are precisely the groups that faced the new penalty tax imposed in 1986. But the data do not appear simply to represent a trend that affected all households after 1986, because households that were 55 and older when they received their LSD did not change their rollover behavior after 1986. This is strongly consistent with the simple tax story outlined in the theoretical section above and with the data discussed in table 9.

However, support for the simple story is not universal. Based on point estimates, LSD recipients aged 45-54 were 10 percentage points more likely to rollover the funds after 1986 than before, but the effect is not statistically significant. This is puzzling because, as figure 1 showed, these households have the biggest incentives to roll over their funds until age 55, since the amount of time they would have to wait to cash in the funds without penalty is the shortest of any group under age 55. Several possible explanations of this anomaly are worth pursuing. One is that this group may have faced a greater percentage of involuntary job separations and that the LSD choices of people who were fired or laid off is different from that of voluntary job changers. A second possibility is that these households are using the funds more for investment purposes and are borrowing constrained. A third possibility is that these households were actually retiring in increased numbers after 1986 compared to before 1986. The most likely possibility is that, since the tax treatment changed in 1986 based on whether the recipient was aged 50 or older, the

age categories are simply mis-specified. In future work, we plan to estimate for the 45-49 and 50-54 year old age groups separately. In any case, this issue deserves further exploration, especially in light of the unambiguous theoretical results in figure 1 and descriptive data in table 9.

In table 12, we use the difference between the LSD tax rate and the retirement tax rate, instead of just the LSD tax rate. Again, the coefficients on the basic demographic variables do not change much and are omitted. The tax results are very similar to those in table 11. The difference between the LSD tax rate and the retirement tax rate has a large and statistically significant effect (first specification), but the effect is limited to the post-1986 period (second specification) and in particular is limited to households who were under the age of 55 when they received their LSD and who received their LSD after 1986 (third specification). There is virtually no change--from before to after 1986--in the rollover behavior of those who received LSDs at ages of 55 and up.[6]

B. Maximum Likelihood Estimates

Table 13 presents our maximum likelihood estimates of the allocation of lump sum distributions, where the relevant equations are described in section III. The main distinction between the maximum likelihood (ML) equations and the probits is that the ML equations take into account the dollar amount of the LSD allocated to each use

There are four specifications of the ML estimates in table 13. The two estimates in the

[6]In the probit estimates above and the other estimates reported below, we also experimented with inclusion of several other variables: whether the household currently has a pension, whether the respondent is currently married, whether the respondent is currently a single mother, and whether the household currently has two earners. None of these were significant in themselves, and none of them affected the main results, so they were dropped from the analysis. One reason why these "usual suspects" turned out not to matter may be that they all refer to the

upper panel mirror the demographic variables in the two panels of table 10. These specifications also include actual LSD size. The two estimates in the lower panel of table 13 have the same variables as the upper panel except that the LSD size categories are omitted. This was done precisely because the specification also includes the actual LSD size as a variable. The difference in the estimates due to including or excluding the LSD size categories, however, turns out to be small.

The basic demographic and economic variables in table 13 have impacts similar to those reported in table 10 for the probits. The main result in the ML estimates is that the r* variable has a large and significant impact on the amount of funds rolled over. The effect is statistically significant in all four specifications.

To simulate the marginal effect of the imposition of the tax penalty on rollover behavior, we estimated equations that control for the right hand side factors and set the penalty rate to zero. Doing so implied that the penalty raised the number of rollovers by 6.5 percent after 1986 and led to an 8.5 percent increase in the amount of dollars rolled over.

C. Effects on Broader Measures of Saving

As noted above, there is an important distinction, from a retirement saving perspective, between encouraging rollovers and encouraging saving. In particular, many uses of LSDs are not tax-preferred rollovers but nevertheless represent saving in an economic sense. Hence, it is interesting to examine the *source* of the increased rollovers that occured among LSD recipients under the age of 55 who received their LSDs after 1986. The implications for policy, for saving, and for retirement income security may well depend on whether the increased rollovers come at the expense of consumption uses of LSD funds or from non-rollover saving.

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household's current status, rather than to its status at the time the LSD was received.

Table 14 shows the effects of tax rates and tax penalties on the probability that a household saves the LSD, using the broad measure of saving defined in conjunction with table 9. For convenience, the comparable coefficients and marginal impacts for the rollover decisions are reported in the first two columns. The coefficients show several interesting patterns. The marginal impact of r* is about two-thirds as large in the broad saving equation than it is in the rollover equation. Roughly speaking, this suggests that two-thirds of the changes in rollovers caused by variation in r* are coming from other saving uses of LSDs and one-third are coming from reduced consumption out of LSDs.

The regressions that control for LSDtax or LSDtax-RETtax, but do not break out the age when received suggest that almost 100 percent of the increase in rollovers due to tax policy was due to reductions in consumption uses of the LSD. Both of these estimates are encouraging in the sense that they suggest that policies that affect rollovers also affect the amount of the LSD that is consumed.

The two sets of estimates that interact age when LSD was received and year when LSD was received provide more detail. For 25-34 year olds, the likelihood of rolling over the funds increased after 1986 by about 16 percentage points, and the likelihood of saving the funds rose by 9 percentage points. Both effects are precisely estimated, and they suggest that for this group, about 60 percent of the increase in rollovers due to tax policy came from what otherwise would have been consumption uses of LSDs. For 35-44 year olds, the post-86 effect on rollovers is about 12-13 percentage points and is statistically significant. But the post-86 impact on saving is between 20 and 50 percent as large and is not statistically different from zero. These findings suggest that for this age group, the tax penalty had a much smaller effect on saving probabilities, and therefore that most of the increased in rollovers came from what otherwise would have been

alternative forms of saving. Overall, the results suggest that it is wrong to assume that all rollovers result in increased saving of LSDs, but that it is difficult at this stage to provide more than a rough conclusion that between half and two-thirds of the increased rollovers due to tax policy come from reduced consumption.

VII. LSDs and Retirement Income Loss

Ultimately, the impact of tax penalties on LSDs is an issue of retirement income security, not simply whether rollovers increase. As a result, the implications of various LSD use patterns for retirement security depend in part on how such distributions affect the lifetime pattern of consumption. People who use distributions to finance pre-retirement consumption may have fewer retirement resources. Even if pre-retirement consumption were unchanged, individuals who spend their distributions may have less retirement income because they end up paying higher taxes over the course of their lives. Only if people use LSDs to finance consumption that they would otherwise finance with very high interest debt – that is, with an interest rate $r > r^*$ – would they have more money available for retirement despite an early distribution than they would have if they had rolled over their distribution.

In table 15, we present estimates of pension loss from LSDs using data from the 1993 CPS, and assuming that the real rate of return on the pension balance would have been 5 percent per year. The average size of LSDs that are not rolled over increases with age of the recipient, because older people have higher salaries and longer average tenure on the job and thus, larger pensions at termination. However, measured in terms of lost pension assets, individuals under 40 lose more than those 40 and over, assuming that assets grow at a real rate of 5 percent. Individuals between 30 and 39 years of age lose the most--over $26,000 of pension wealth

expressed in 1993 dollars--from their early distributions, about one-third larger than the loss experienced by those age 50 and over. Similarly, although the average size of distributions spent tends to increase with income, the pension loss is virtually flat for incomes between $10,000 and $75,000 in 1993. All told, pension loss ranges from about $16,000 for low-income workers to $29,500 for those with incomes over $75,000. If rates of return on annuities average between 6 and 10 percent (Mitchell, Poterba, Warshawsky 1997), these pension loss estimates imply reductions in retirement consumption of about $1,000 to $3,000 per year among households that did not roll over their LSDs.

Three factors, however, suggest that these estimates overstate the loss in retirement income. First, the estimates do not indicate the extent to which pension participation is increased due to the increased liquidity created by LSDs. Second, it is unclear what would have happened to the funds if they had not been cashed out. In particular, employees who receive a distribution from a DB pension plans might well have more pension assets if they save the funds than they would have if they left them in their previous employer's pension plan. Third, as the data in tables 9 and 14 indicate, a significant proportion of the funds that are not rolled over are nevertheless saved in one form or another, and so may contribute to wealth at the age of retirement, even if that wealth does not show up in qualified retirement accounts.

However, even if the absolute magnitude of the pension loss is overstated, the relative importance of the average pension loss may be understated. In particular, the *distribution* of losses is crucial to assessing the importance of the any loss estimate. For example, the relative size of the calculated income loss clearly varies by income group. Table 15 shows that the average pension loss is equal to or greater than a year's income for most people with incomes under $20,000. Those with incomes under $10,000 are, on average, dissolving a pension account

that could otherwise grow to about $16,000 by retirement; those with incomes between $10,000 and $20,000 lose over $22,000 in retirement assets. For households with income above $75,000, pension loss is about one-third or less of average income.

The data show that households that are younger, have lower income, or have less formal education are more likely to consume their LSDs rather than save them. These households, however, are also the ones for whom pensions are most likely to represent new saving. Gale (1998) finds that households that are young, borrowing-constrained, or have low wealth are least likely to reduce other wealth to finance their pension -- that is, pensions have the biggest impact on overall wealth for these households.

Thus, there appears to be a substantial overlap between (a) the households for whom pensions are most likely to represent additional saving and (b) households that are most likely not to retain their pension saving, given the chance to opt out of the pension system. It would be interesting to examine these issues in more detail and to compare these households with ones that are not saving adequately for retirement.

More generally, comparing the impact of LSDs on average retirement wealth is misleading. First, retirement wealth is skewed, so that the median, or typical, household will have less in pension wealth than the mean household. Second, LSDs may have a large percentage effect on the retirement income of those who withdraw the funds, even if they do not have a big effect on the overall household.

VIII. Discussions and Conclusions

The results above raise a number of interesting issues concerning the costs and benefits of lump sum distributions.

Trade-offs between pension portability, liquidity, and retirement income security It is

sometimes claimed that pension policy faces a trade-off between pension portability and job mobility on one hand, and retirement income security on the other hand, and that lump-sum distributions subject to a penalty are the effect of a compromise among these goals. This claim, however, overlooks the fact that pension portability and job mobility can be provided without allowing workers to cash-in their LSDs before retirement. A simple rule that allowed complete portability of pension balances across jobs but required that pensions be rolled over would resolve this dilemma. Andrews (1991b) notes that Canada, the UK, and the Netherlands strictly regulate the extent to which employees can receive pre-retirement distributions.

However, there is a clear trade-off between encouraging saving for retirement and saving for other goals. When a worker has, say, $100,000 in a pension or IRA, but loses a job and is about to default on a mortgage, the correct policy might not be to require households to maintain pension balances until retirement. Thus, understanding the impact on overall saving of allowing consumption out of tax-preferred accounts for non-retirement purposes is another crucial task for future research.

Interactions with other policies The 1997 Tax Act allows taxpayers to withdraw from any IRA, without penalty, up to $10,000 for a down payment on a home, or an unlimited amount for educational expenses. The Act also raised the amount of defined benefit or defined contribution balance that departing employees could be compelled to take as an LSD from $3,500 to $5,000; this will confront more employees with decisions about lump sums. These provisions clearly intend to further other policy objectives or ease hardship. However, each provision reduces the likelihood that amounts in pension accounts and IRAs will survive intact until retirement.

Contributions to Roth IRAs are not deductible from taxable income, but earnings are

exempt from tax. Conversions of IRAs to Roth IRAs and deposits of qualified LSDs into Roth IRAs are exempt from the ten-percent penalty for early withdrawals. (Individuals who converted IRA balances to Roth IRAs in 1998 benefited further by being able to pay the tax in four annual installments.) The money, once in the Roth IRA, may be withdrawn for any purpose after five years without recapture of the 10% penalty. Those who want to spend their LSD without paying a penalty, can transfer it to a Roth IRA, pay income tax on the distribution, and wait for it to be subject to the more generous rules that apply. Thus, the presence of Roth IRAs might dilute the effect on any effort to encourage rollovers.

The effects and issues raised above do not point consistently to a single, unambiguously optimal policy for lump sum distributions. Changing the tax penalty or the rate of withholding, having those rates vary with age, requiring some minimum proportion of the distribution to be rolled over, and providing financial education to potential recipients of distributions are examples of options that warrant further study.

It is clear, however, that these issues will need to be addressed. Low levels of measured U.S. personal and national saving have raised concerns about the adequacy of households' preparations for retirement. The shift toward defined contribution plans provides workers with more discretion over participation, contribution, investment, and withdrawal decisions regarding their pensions. The aging of the baby boomers and the phenomenon of increasing life span will focus increased attention on retirement issues. Thus, the treatment of early withdrawals from pensions promises to become an increasingly important issue in the future.

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Table 1
Predicted Effect of Independent Variables on Rollover Decisions

	Independent Variable					
Dependent Variable	**Age***	**Current Tax Rate**	**Penalty on Early Withdrawal***	**Retirement Tax Rate**	**Opportunity Cost of Funds**	**Size of Lump-Sum Distribution**
Rollover All	+	+	+	---	---	0**
Rollover Some	---	---	---	+	+	+
Rollover None	---	---	---	+	+	---

* Age and withdrawal penalty have a positive effect on rollover decisions until age 54, after which the penalty does not apply for distributions made when an employee leaves a job. (See text.)

** Size of distribution should not affect the probability of rolling over the entire distribution, controlling for opportunity cost of funds. With imperfect controls, size of LSD might proxy for non-pension wealth and produces a positive effect on rollover decisions.

Table 2
Eligibility for Lump-Sum Distributions in 1993
By Plan Type and Selected Demographic Characteristics

	All Pensions	Defined Contribution Plans	Defined Benefit Plans	Marginal Effect (%)
All Workers with Pensions	68	79	58	. . .
Age				
Under 35	70	83	60	. . .
35-44	70	80	59	-4
45-54	65	74	56	-10 **
55-64	64	75	55	-8
65 and Over	69	76	66	10
Household Income				
Under 10,000	56	65	61	. . .
10,000-19,999	64	78	57	21
20,000-29,999	66	81	59	32 **
30,000-39,999	70	85	63	41 **
40,000-49,999	66	78	55	34 **
50,000-74,999	70	80	57	41 **
75,000 and Over	68	74	58	29 **
Males	66	78	55	-1
Females	70	80	62	. . .
White	68	79	57	. . .
Non-White	68	78	61	0.2

Note: The sample is restricted to workers participating in a pension plan on their current job, and excludes the 15.6% of the respondents who report not knowing whether they would qualify for a distribution. The marginal effects, which indicate the percentage increase in probability of being eligible for a distribution, were estimated by a probit equation, controlling for age, household income, gender, race, occupation, industry, education, union status, and type of pension plan.

*,** indicates significance at the 5% and 1% level, respectively.

Source: Authors' computations of the 1993 Employee Benefits Survey of the CPS.

Table 3
Eligibility for Lump-Sum Distributions in 1993
By Plan Type, Education, and Employment Characteristics

	All Pensions	Defined Contribution Plans	Defined Benefit Plans	Marginal Effect (%)	
All Workers with Pensions	68	79	58	. . .	
Occupation					
Manager/Professional	71	79	63	. . .	
Sales/Technician	71	82	55	-5	
Clerical	73	81	64	5	
Services	64	76	59	-6	
Farm/Fishing/Forestry	68	74	65	-31	
Craft/Production	61	76	51	-20	**
Operator/laborer	57	80	43	-21	**
Industry					
Agriculture/Mining/ Construction	66	80	60	-8	
Manufacturing	64	78	48	-17	**
Transportation/Public Utilities/Communication	62	77	49	-16	**
Wholesale and Retail Trade/ FIRE	72	85	57	-9	**
Services	70	77	65	. . .	
Education					
Less than HS diploma	60	78	49	. . .	
HS graduate	66	80	55	12	*
Some college, no degree	67	80	58	8	
4 yrs college completed	71	80	61	15	**
4+ yrs college	70	73	63	9	
Covered under Union Contract	71	69	52	-28	**

Note: The sample is restricted to workers participating in a pension plan on their current job, and excludes the 15.6% of the respondents who report not knowing whether they would qualify for a distribution. The marginal effects, which indicate the percentage increase in probability of being eligible for a distribution, were estimated by a probit equation, controlling for age, household income, gender, race, occupation, industry, education, union status, and type of pension plan.

*, ** indicates significance at the 5% and 1% level, respectively.

Source: Authors' computations of the 1993 Employee Benefits Survey of the CPS.

Table 4
Percentage Distribution of Respondents Under Age 60, By Roll-Over Status

	1993 CPS			1988 CPS		
	Rolled All	**Rolled Some**	**Rolled None**	**Rolled All**	**Rolled Some**	**Rolled None**
All LSD recipients	20.3	2.6	75.8	11.0	2.2	85.6
Household Income						
Under 10,000	3.6	4.9	90.2	3.8	0.0	89.9
10,000-19,999	6.4	1.5	91.4	6.1	2.2	91.0
20,000-29,999	11.1	2.9	85.8	7.5	1.7	90.6
30,000-39,999	16.1	2.7	79.5	10.0	2.0	86.9
40,000-49,999	18.7	3.0	78.2	15.0	1.9	80.8
50,000-74,999	29.8	2.3	65.7	18.9	1.0	78.6
75,000 and Up	29.9	3.0	65.7	19.3	6.3	74.4
Age Received						
Under 25	7.8	0.3	89.4	4.9	0.4	92.1
25-34	15.2	1.7	81.7	8.4	1.8	89.0
35-44	27.3	3.8	68.4	13.3	1.7	83.9
45-49	32.6	5.1	62.3	18.0	6.0	74.5
50-54	37.1	9.6	52.1	26.4	5.9	65.0
55-59	48.1	1.8	49.3	35.1	9.9	51.9
Year Received						
Pre 1970	10.6	0.4	83.7	2.4	0.7	94.2
1970-1974	5.8	0.0	94.0	1.1	1.5	96.3
1975-1979	8.1	0.1	90.7	5.8	1.5	91.9
1980-1986	15.8	1.6	82.0	13.7	2.3	83.0
1987-1990	22.9	3.0	72.3	NA	NA	NA
1991-1993	30.6	5.0	64.5	NA	NA	NA

Source: Authors' computations of the 1988 and 1993 Employee Benefit Supplement to the CPS.

Table 5
Percentage Distribution of Lump-Sum Distribution Dollars
By Roll-Over Status

	1993 CPS			1988 CPS		
	Rolled All	**Rolled Some**	**Rolled None**	**Rolled All**	**Rolled Some**	**Rolled None**
All LSD Dollars	43.4	7.5	49.0	23.3	6.5	70.0
Household Income						
Under 10,000	2.3	40.2	57.2	22.1	0.0	77.9
10,000-19,999	13.1	2.9	84.0	5.3	15.5	79.2
20,000-29,999	23.4	12.8	63.7	12.5	4.2	83.3
30,000-39,999	42.5	7.6	49.5	17.0	3.7	79.2
40,000-49,999	44.8	3.9	51.3	30.4	1.2	68.0
50,000-74,999	49.5	7.4	42.9	42.6	0.7	56.2
75,000 and Up	52.7	6.5	40.7	36.3	12.5	51.2
Age Received						
Under 25	2.7	2.0	94.9	7.1	0.0	92.8
25-34	25.8	3.4	70.4	13.5	3.1	83.1
35-44	48.2	9.7	41.9	20.2	5.4	74.3
45-49	53.3	5.6	41.1	35.1	15.4	49.4
50-54	57.9	16.1	25.9	27.8	17.1	55.1
55-59	59.8	4.6	35.4	55.9	3.3	40.2
Year Received						
Pre 1970	17.0	0.0	82.6	0.3	0.0	99.7
1970-1974	13.7	0.0	86.3	18.9	0.0	81.1
1975-1979	14.0	0.2	85.5	30.2	7.2	62.6
1980-1986	38.7	2.1	59.0	23.2	7.7	69.0
1987-1990	48.4	8.9	42.5	NA	NA	NA
1991-1993	51.0	12.9	36.1	NA	NA	NA

Note: The sample is restricted to respondents who received a lump-sum distribution at an age of 60 or less.

Source: Authors' tabulations of the 1988 and 1993 Employee Benefit Supplement to the CPS.

Table 6
Disposition of Lump-Sum Distributions by Age at Receipt
Based on 1993 CPS

Panel A: Distribution of Respondents

	Age Received							
	Under 25	**25-34**	**35-44**	**45-49**	**50-54**	**55-59**	**Under 60**	**60 and Over**
IRA and Annuity Roll Overs								
Deposited in IRA	7.5	15.8	27.8	35.3	44.2	46.4	21.1	23.2
Bought Annuity	0.6	1.1	3.4	4.1	2.6	3.5	2.0	5.5
Total:	**8.1**	**16.9**	**31.2**	**39.4**	**46.8**	**49.9**	**23.1**	**28.7**
Other Savings and Investments								
Invested in other ways	13.9	15.7	18.0	19.7	16.4	21.8	16.5	38.5
Bought Business	0.4	3.0	6.0	3.8	6.0	2.6	3.6	2.0
Bought a Home	3.1	12.8	8.3	4.8	7.1	8.9	9.2	0.6
Paid Debts	23.1	21.0	16.2	14.5	11.9	8.7	18.9	13.8
Total:	**40.6**	**52.6**	**48.5**	**42.8**	**41.4**	**42.1**	**48.2**	**55.0**
Educational and Medical								
Paid Medical Expenses	1.1	1.4	2.7	1.9	1.5	4.2	1.8	3.3
Paid Educational Expenses	3.8	3.6	2.1	1.7	3.2	0.7	3.0	0.0
Total:	**4.9**	**5.0**	**4.8**	**3.6**	**4.7**	**4.9**	**4.8**	**3.3**
Spent								
Spent it on Everyday Expenses	37.5	25.8	25.9	27.2	20.2	14.0	27.1	25.8
Bought Consumer Items	9.4	9.3	4.9	4.8	1.7	1.7	7.3	3.9
Other	5.3	3.9	3.6	2.9	5.7	1.5	4.0	5.9
Total:	**52.2**	**39.0**	**34.4**	**34.9**	**27.7**	**17.1**	**38.5**	**35.6**
Number of Respondents	402	1225	686	202	108	71	2694	48

Panel B: Percentage Distribution of Amounts (in 1993 Dollars)

	Age Received							
	Under 25	**25-34**	**35-44**	**45-49**	**50-54**	**55-59**	**Under 60**	**60 and Over**
IRA and Annuity Roll Overs								
Deposited in IRA	3.6	25.0	49.2	46.7	63.4	56.0	43.0	33.5
Bought Annuity	0.1	2.5	3.7	9.4	2.5	5.3	4.0	3.9
Total:	**3.7**	**27.5**	**52.9**	**56.1**	**65.9**	**61.3**	**47.0**	**37.4**
Other Savings and Investments								
Invested in other ways	12.0	15.8	12.2	14.4	13.7	12.8	13.7	36.2
Bought Business	1.2	3.8	9.1	4.9	6.4	3.1	5.9	2.8
Bought a Home	6.5	15.6	5.3	1.8	2.2	9.3	7.8	0.3
Paid Debts	28.0	11.6	5.8	3.5	2.5	5.3	7.4	1.5
Total:	**47.6**	**46.8**	**32.3**	**24.5**	**24.7**	**30.5**	**34.8**	**40.9**
Educational and Medical								
Paid Medical Expenses	0.8	0.6	0.7	0.2	0.2	1.2	0.6	0.7
Paid Educational Expenses	2.2	3.2	0.7	1.6	1.0	0.2	1.6	0.0
Total:	**3.0**	**3.8**	**1.4**	**1.8**	**1.3**	**1.4**	**2.1**	**0.7**
Spent								
Spent it on Everyday Expenses	26.1	14.5	10.0	14.5	3.2	4.9	11.1	12.6
Bought Consumer Items	17.3	4.9	1.9	1.6	0.4	0.5	2.9	1.3
Other	3.1	2.2	1.3	1.6	4.5	1.1	2.0	7.2
Total:	**46.5**	**21.6**	**13.2**	**17.6**	**8.1**	**6.6**	**15.9**	**21.1**
Average Size of Distribution	2,452	6,281	13,516	18,537	26,183	34,731	10,318	30,348

Note: Restricted to respondents who have ever received a lump sum distribution.

Source: Authors' tabulations of the 1993 Employee Benefit Supplement to the CPS.

Table 7
Disposition of Lump-Sum Distributions by Age at Receipt
Based on 1988 CPS

Panel A: Distribution of Respondents

	Age Received							
	Under 25	**25-34**	**35-44**	**45-49**	**50-54**	**55-59**	**Under 60**	**60 and Over**
IRA and Annuity Roll Overs								
Deposited in IRA	3.9	8.5	12.5	20.3	26.1	45.0	11.1	20.7
Bought Annuity	1.4	1.8	2.5	4.8	7.7	1.9	2.3	2.3
Total:	**5.4**	**10.3**	**15.0**	**25.1**	**33.9**	**46.9**	**13.4**	**23.1**
Other Savings and Investments								
Invested in other ways	20.5	23.0	24.5	27.3	26.4	28.0	23.5	37.5
Bought Business	0.0	0.8	3.0	3.4	5.4	2.6	1.6	0.0
Bought a Home	6.8	11.4	8.8	6.7	5.3	6.1	9.3	1.8
Paid Debts	21.0	23.9	24.3	9.2	18.6	6.0	22.0	21.5
Total:	**48.4**	**59.0**	**60.5**	**46.6**	**55.7**	**42.7**	**56.3**	**60.8**
Educational and Medical								
Paid Educational Expenses	8.1	3.5	2.3	6.8	7.9	2.8	4.3	0.0
Total:	**8.1**	**3.5**	**2.3**	**6.8**	**7.9**	**2.8**	**4.3**	**0.0**
Spent it								
Paid Expenses during Unemployment	4.8	8.0	6.0	8.7	5.1	0.3	6.7	5.8
Bought Consumer Items	3.5	3.8	3.6	4.0	2.0	2.1	3.6	12.1
Other	30.8	26.0	27.2	23.4	15.3	24.3	26.5	21.4
Total:	**39.0**	**37.8**	**36.8**	**36.1**	**22.4**	**26.7**	**36.8**	**39.3**
Number of Respondents	315	844	479	115	79	48	1,880	33

Panel B: Percentage Distribution of Amounts (in 1993 Dollars)

	Age Received							
	Under 25	**25-34**	**35-44**	**45-49**	**50-54**	**55-59**	**Under 60**	**60 and Over**
IRA and Annuity Roll Overs								
Put in IRA	4.3	13.3	17.3	39.9	28.5	48.2	21.8	15.9
Bought Annuity	2.8	1.7	4.9	2.2	7.9	9.4	4.4	5.6
Total:	**7.1**	**15.1**	**22.2**	**42.0**	**36.3**	**57.6**	**26.2**	**21.5**
Other Savings and Investments								
Invested in other ways	13.8	17.7	26.8	21.9	31.9	14.9	22.5	59.1
Bought Business	0.0	2.0	4.0	7.1	11.1	0.0	4.0	0.0
Bought a Home	11.5	16.8	10.9	5.6	2.5	2.5	10.4	0.2
Paid Debts	15.2	16.8	10.6	4.5	5.6	3.2	10.8	5.4
Total:	**40.5**	**53.3**	**52.3**	**39.0**	**51.2**	**20.6**	**47.7**	**64.7**
Educational and Medical								
Paid Educational Expenses	18.1	5.9	0.9	2.5	2.3	1.4	3.6	0.0
Total:	**18.1**	**5.9**	**0.9**	**2.5**	**2.3**	**1.4**	**3.6**	**0.0**
Spent it								
Paid Expenses during Unemployment	4.5	5.7	3.4	6.5	0.9	0.0	3.8	1.5
Bought Consumer Items	4.7	3.2	2.5	4.4	0.7	0.8	2.6	7.4
Other	25.0	16.5	18.6	5.5	8.6	19.1	15.9	4.9
Total:	**34.2**	**25.5**	**24.6**	**16.4**	**10.1**	**19.9**	**22.4**	**13.8**
Average Size of Distribution	2,211	4,899	9,898	11,665	21,989	30,015	7,470	19,958

Note: Restricted to respondents who have ever received a lump sum distribution.

Source: Authors' tabulations of the 1988 Employee Benefit Supplement to the CPS.

Table 8
Disposition of Lump Sum Distributions by Year of Receipt

Panel A: Percentage of Recipients Aged 55 or Under

	1993 CPS							1988 CPS			
	1985	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1985**	**1986**	**1987**	**1988**
Deposited in IRA	15.5	20.2	19.3	26.3	22.3	22.1	33.0	15.0	12.6	15.8	16.2
Bought Annuity	1.3	0.5	0.8	3.2	4.7	3.1	2.0	2.2	3.2	2.6	5.3
Invested in other ways	21.0	18.9	16.2	16.5	16.4	20.6	12.0	27.3	23.2	28.0	24.3
Bought Business	2.2	5.1	2.6	1.9	3.8	1.8	4.0	1.8	3.8	1.0	0.7
Bought a Home	9.3	11.5	8.0	6.8	7.3	9.9	5.9	11.2	9.7	7.4	6.6
Paid Debts	24.1	22.4	22.0	18.6	17.2	17.3	30.1	21.8	22.2	23.6	23.9
Bought Consumer Items	7.9	10.5	4.1	5.5	7.8	6.7	4.1	3.2	4.0	5.4	1.1
Paid Medical Expenses	1.6	1.7	1.5	3.0	1.0	3.2	2.2				
Paid Educational Expenses	3.4	2.2	4.0	2.6	2.0	3.8	2.9	3.0	3.5	2.5	1.1
Spent it on Everyday Expenses	29.8	24.7	31.8	31.6	23.5	26.3	22.8				
Paid Unemployment Costs								7.6	7.2	4.6	5.1
Other	1.7	1.4	0.0	4.8	4.5	4.0	3.3	18.0	23.3	28.5	24.6
Number of Respondents	116	148	177	207	243	246	232	158	192	261	99

Panel B: Percentage of Lump Sum Distribution Dollars

	1993 CPS							1988 CPS			
	1985	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1985**	**1986**	**1987**	**1988**
IRA and Annuity Roll Overs											
Deposited in IRA	25.0	23.4	51.1	36.6	50.1	48.9	47.1	19.2	19.6	20.1	33.8
Bought Annuity	15.6	1.9	1.1	4.4	8.3	7.5	5.3	2.3	1.9	4.9	8.2
Total:	**40.6**	**25.3**	**52.2**	**41.0**	**58.4**	**56.3**	**52.4**	**21.4**	**21.5**	**25.0**	**42.0**
Other Savings and Investment											
Invested in other ways	18.7	17.6	18.1	15.0	11.2	15.2	6.5	28.9	16.9	26.9	18.2
Bought Business	3.9	9.9	2.1	3.0	4.6	2.3	7.7	1.3	6.1	2.8	1.0
Bought a Home	9.4	9.2	2.8	7.7	6.9	6.1	4.9	11.2	9.1	6.7	4.7
Paid Debts	6.8	7.6	9.8	6.8	7.4	4.0	14.2	10.7	8.2	10.1	5.1
Total:	**22.6**	**27.5**	**20.2**	**18.0**	**15.8**	**17.5**	**14.2**	**30.1**	**23.0**	**29.7**	**19.2**
Educational and Medical											
Paid Medical Expenses	0.6	0.4	0.6	0.5	0.2	0.8	0.5				
Paid Educational Expenses	0.6	0.3	2.8	3.7	0.9	1.2	1.8	11.5	1.7	1.8	0.2
Total:	**1.3**	**0.7**	**3.4**	**4.2**	**1.1**	**1.9**	**2.3**	**11.5**	**1.7**	**1.8**	**0.2**
Spent											
Bought Consumer Items	2.8	3.8	1.9	1.9	2.5	2.7	1.7	4.2	3.6	4.0	0.2
Spent it on Everyday Expenses	16.3	24.6	9.3	17.7	5.1	10.9	7.4				
Paid Unemployment Costs								4.6	4.6	3.7	0.7
Other	0.2	1.1	0.0	2.7	2.4	0.3	2.8	6.2	28.4	18.6	27.7
Total:	**3.0**	**4.9**	**1.9**	**4.6**	**5.0**	**3.0**	**4.5**	**10.3**	**32.0**	**22.5**	**27.9**

Note: Sample is restricted to respondents who had received a lump sum distribution when they were 55 or younger.

Source: Authors' tabulations of the 1988 and 1993 Employee Benefits Supplement of the Current Population Survey (CPS).

Table 9
Disposition of Lump-Sum Distributions, by Year of Receipt, Age at Receipt, and Saving Definition

Age When LSD Received	25-54		55-64	
Year When LSD Received	**1981-86**	**1987-93**	**1981-86**	**1987-93**
Proportion of Recipients Who Saved the LSD				
--Narrow Saving	0.142	0.245	0.395	0.378
--Intermediate Saving	0.439	0.485	0.689	0.702
--Broad Saving	0.619	0.636	0.743	0.723
Proportion of LSD Funds Saved				
--Narrow Saving	0.248	0.445	0.562	0.389
--Intermediate Saving	0.574	0.700	0.832	0.792
--Broad Saving	0.688	0.769	0.895	0.798
LSD Tax Rate	0.170	0.225	0.227	0.128

Note: Saving definitions provided in the text.

Source: Authors' tabulations using the 1993 Employee Benefit Supplement of the Current Population Survey.

Table 10
Probit Estimates of Rollovers with r*, 1993 CPS

	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx
rstar				13.2282	5.9033 **	3.7521
Basic Specification						
educ2	-0.0224	0.1913	-0.0063	-0.0300	0.1906	-0.0085
educ3	0.1786	0.1942	0.0529	0.1745	0.1934	0.0516
educ4	0.4153	0.1895 **	0.1236	0.4152	0.1888 **	0.1234
educ5	0.2224	0.1994	0.0670	0.2317	0.1989	0.0699
income_2	0.0212	0.1279	0.0060	-0.0009	0.1283	-0.0003
income_3	-0.0136	0.1243	-0.0039	-0.1156	0.1327	-0.0318
income_4	0.2447	0.1155 **	0.0731	0.2007	0.1169 *	0.0594
income_5	0.4387	0.1118 **	0.1342	0.4308	0.1118 **	0.1316
age35_44	0.3709	0.0763 **	0.1113	0.3363	0.0779 **	0.1004
age45_54	0.5265	0.1015 **	0.1711	0.4334	0.1099 **	0.1380
age55	0.5663	0.1446 **	0.1904	0.4532	0.1533 **	0.1482
lsd_2	0.4407	0.1218 **	0.1306	0.4457	0.1219 **	0.1320
lsd_3	0.6868	0.1322 **	0.2260	0.6912	0.1324 **	0.2274
lsd_4	0.8647	0.1252 **	0.2744	0.8635	0.1253 **	0.2738
constant	-1.9565			-1.9611		
Pseudo r^2		0.1068			0.1094	
Log Likelihood		-967.4556			-964.6147	
rstar				14.8612	5.9520 **	3.9468
Extended Specification						
educ2	-0.1635	0.2015	-0.0419	-0.1732	0.2008	-0.0442
educ3	0.0293	0.2042	0.0079	0.0256	0.2035	0.0068
educ4	0.1694	0.1999	0.0461	0.1701	0.1993	0.0462
educ5	-0.0754	0.2104	-0.0196	-0.0650	0.2099	-0.0169
income_2	-0.0246	0.1354	-0.0065	-0.0455	0.1357	-0.0119
income_3	-0.0768	0.1309	-0.0200	-0.1894	0.1390	-0.0476
income_4	0.1116	0.1223	0.0305	0.0656	0.1235	0.0177
income_5	0.1844	0.1193	0.0509	0.1761	0.1193	0.0485
age35_44	0.4194	0.0797 **	0.1195	0.3805	0.0814 **	0.1076
age45_54	0.5869	0.1071 **	0.1841	0.4811	0.1154 **	0.1471
age55	0.6338	0.1525 **	0.2072	0.4888	0.1630 **	0.1537
lsd_2	0.4323	0.1274 **	0.1206	0.4416	0.1277 **	0.1231
lsd_3	0.6676	0.1379 **	0.2090	0.6754	0.1382 **	0.2114
lsd_4	0.7569	0.1311 **	0.2261	0.7566	0.1314 **	0.2257
intdiv_2	-0.1817	0.2222	-0.0448	-0.1531	0.2222	-0.0381
intdiv_3	0.4695	0.1231 **	0.1393	0.4627	0.1234 **	0.1369
intdiv_4	0.7346	0.1191 **	0.2270	0.7265	0.1194 **	0.2239
intdiv_5	1.0360	0.1172 **	0.3220	1.0419	0.1174 **	0.3236
ownhome	0.1357	0.0887	0.0350	0.1516	0.0892 *	0.0389
nonwhite	-0.4053	0.1704 **	-0.0906	-0.4151	0.1707 **	-0.0922
constant	-2.3229			-2.3431		
Pseudo r^2		0.169			0.1723	
Log Likelihood		-900.08481			-896.50706	

*,** indicates significance at the 5% and 1% level, respectively.

Source: Authors' estimates using the 1993 CPS.

Table 11
Probit Estimates of Rollovers with LSDTax, 1993 CPS

	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx
Using Basic Specification									
LSDtax	2.4207	0.5381 **	0.6824						
LSDtax*pre87				-0.1231	0.5657	-0.0347			
LSDtax*post86				2.1692	0.6976 **	0.6115			
Inctax*pre87							0.9602	0.7172	0.2676
Inctax*post86							1.3128	0.7566 *	0.3659
age25_86							0.5181	0.1434 **	0.1558
age35_86							0.4235	0.1689 **	0.1296
age45_86							0.3412	0.2271	0.1057
age55_86							-0.0049	0.3393	-0.0014
Pseudo r^2		0.1163			0.1207			0.1280	
Log Likelihood		-957.1672			-952.3928			-944.5003	
Using Extended Specification									
LSDtax	2.3848	0.5549 **	0.6302						
LSDtax*pre87				-0.4442	0.5842	-0.1170			
LSDtax*post86				2.0028	0.7212 **	0.5277			
Inctax*pre87							0.7995	0.7392	0.2069
Inctax*post86							0.9406	0.7863	0.2434
age25_86							0.6157	0.1515 **	0.1760
age35_86							0.5139	0.1790 **	0.1505
age45_86							0.4229	0.2406 *	0.1261
age55_86							0.0765	0.3500	0.0205
Pseudo r^2		0.1776			0.1841			0.1932	
Log Likelihood		-890.6995			-883.6724			-873.8881	

*,** indicates significance at the 5% and 1% level, respectively.

Source: Authors' estimates using the 1993 CPS.

Table 12
Probit Estimates of Rollovers, with LSDTax-RetTax, 1993 CPS

	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx
Using Basic Specification									
LSDtax-Rettax	1.4460	0.5291 **	0.4092						
(LSDtax-Rettax)*pre87				-0.8188	0.8179	-0.2302			
(LSDtax-Rettax)*post86				1.7889	0.5364 **	0.5029			
(Inctax-Rettax)*pre87							-1.3877	1.0121	-0.3863
(Inctax-Rettax)*post86							-0.5337	0.7382	-0.1485
age25_86							0.5287	0.1063 **	0.1590
age35_86							0.3945	0.1367 **	0.1199
age45_86							0.2972	0.2065	0.0908
age55_86							-0.0518	0.3231	-0.0141
Pseudo r^2		0.1102			0.1167			0.1274	
Log Likelihood		-963.6993			-956.6981			-945.1320	
Using Extended Specification									
LSDtax-Rettax	1.9335	0.5491 **	0.5115						
(LSDtax-Rettax)*pre87				-0.3667	0.8436	-0.0963			
(LSDtax-Rettax)*post86				2.3059	0.5578 **	0.6053			
(Inctax-Rettax)*pre87							-0.7434	1.0445	-0.1922
(Inctax-Rettax)*post86							-0.2164	0.7657	-0.0560
age25_86							0.6112	0.1110 **	0.1745
age35_86							0.4798	0.1428 **	0.1394
age45_86							0.3791	0.2159 *	0.1115
age55_86							0.0328	0.3332	0.0086
Pseudo r^2		0.1747			0.1811			0.1926	
Log Likelihood		-893.8321			-886.9988			-874.4919	

*,** indicates significance at the 5% and 1% level, respectively.

Source: Authors' estimates using the 1993 CPS.

Table 13
Maximum Likelihood Estimates, 1993 CPS

	Basic Specification		Extended Specification	
ml	**coefficient**	**Std Err**	**coefficient**	**Std Err**
LSD Size Categories Included				
rstar	17.1352	5.9436 **	17.8497	5.9584 **
educ2	-0.0968	0.1952	-0.1184	0.1956
educ3	0.1102	0.1980	0.1033	0.1981
educ4	0.2390	0.1943	0.2351	0.1944
educ5	0.0233	0.2042	0.0174	0.2043
income_2	-0.0498	0.1299	-0.0452	0.1303
income_3	-0.1649	0.1327	-0.1603	0.1330
income_4	0.0460	0.1189	0.0374	0.1192
income_5	0.1780	0.1142	0.1758	0.1146
age35_44	0.3800	0.0785 **	0.3776	0.0787 **
age45_54	0.5134	0.1103 **	0.4996	0.1111 **
age55	0.4933	0.1552 **	0.4745	0.1561 **
lsd_2	0.3926	0.1284 **	0.3873	0.1283 **
lsd_3	0.6300	0.1380 **	0.6319	0.1379 **
lsd_4	0.7380	0.1323 **	0.7265	0.1321 **
intdiv_2	-0.0671	0.2003	-0.0806	0.2011
intdiv_3	0.5138	0.1160 **	0.4858	0.1170 **
intdiv_4	0.7745	0.1122 **	0.7441	0.1135 **
intdiv_5	1.0714	0.1104 **	1.0311	0.1120 **
ownhome			0.1063	0.0846
nonwhite			-0.2927	0.1521 *
constant	-2.3340	0.2442 **	-2.3593	0.2499 **
log(amtlsd93)	0.0681	0.0093 **	0.0686	0.0094 **
constant	-0.4662	0.0684 **	-0.4695	0.0686 **
Log likelihood		-1120.1948		-1117.3204
LSD Size Categories Not Included				
rstar	17.2606	5.7939 **	18.0014	5.8103 **
educ2	-0.0968	0.1897	-0.1170	0.1902
educ3	0.1045	0.1926	0.0988	0.1930
educ4	0.2175	0.1886	0.2163	0.1890
educ5	0.0261	0.1988	0.0215	0.1992
income_2	-0.1207	0.1271	-0.1159	0.1276
income_3	-0.2016	0.1304	-0.1965	0.1307
income_4	0.0356	0.1170	0.0266	0.1173
income_5	0.2211	0.1125 **	0.2164	0.1129 *
age35_44	0.4706	0.0760 **	0.4649	0.0763 **
age45_54	0.6341	0.1062 **	0.6150	0.1070 **
age55	0.6658	0.1512 **	0.6406	0.1522 **
intdiv_2	-0.0506	0.1968	-0.0662	0.1976
intdiv_3	0.5112	0.1134 **	0.4796	0.1145 **
intdiv_4	0.7919	0.1097 **	0.7581	0.1111 **
intdiv_5	1.1147	0.1078 **	1.0692	0.1096 **
ownhome			0.1223	0.0832
nonwhite			-0.2995	0.1509 **
constant	-1.8810	0.2126 **	-1.9199	0.2191 **
log(amtlsd93)	0.0810	0.0099 **	0.0815	0.0100 **
constant	-0.5590	0.0704 **	-0.5622	0.0707 **
Log likelihood		-1140.7082		-1137.3821

*,** indicates significance at the 5% and 1% level, respectively.

Source: Authors' estimates using the 1993 CPS.

Table 14
Effects of Tax Penalties on Narrow and Broad Measures of Saving, 1993 CPS*

	Rollover			Broad Saving		
Variable	**Coefficient**	**Std Err**	**dF/dx**	**Coefficient**	**Std Err**	**dF/dx**
rstar	13.2282	5.9033 **	3.7521	6.5731	5.7653	2.5086
LSD tax	2.4207	0.5381 **	0.6824	1.7834	0.4730 **	0.6803
LSD tax *pre87	-0.1231	0.5957	-0.0347	0.1391	0.5135	0.0530
LSD tax *post86	2.1692	0.6976 **	0.6115	1.7913	0.6398 **	0.6831
Inctax*pre87	0.9602	0.7172	0.2676	0.3176	0.6557	0.1211
Inctax*post86	1.3128	0.7566 *	0.3659	1.1551	0.7027	0.4404
Age25_34*post86	0.5181	0.1434 **	0.1558	0.2500	0.1082 **	0.0936
Age35_44*post86	0.4235	0.1689 **	0.1296	0.0655	0.1415	0.0248
Age45_54*post86	0.3412	0.2271	0.1057	0.2499	0.2040	0.0917
Age55+*post86	-0.0049	0.3393	-0.0014	-0.4167	0.3680	-0.1641
LSDtax-Rettax	1.4460	0.5291 **	0.4092	1.0015	0.4557 **	0.3822
(LSDtax-Rettax)*pre87	-0.8188	0.8179	-0.2302	0.0424	0.6759	0.0162
(LSDtax-Rettax)*post86	1.7889	0.5364 **	0.5029	1.1385	0.4617 **	0.4345
(Inctax-Rettax)*pre87	-1.3877	1.0121	-0.3863	-0.5596	0.3117	-0.2134
(Inctax-Rettax)*post86	-0.5337	0.7382	-0.1485	-0.6337	0.2512	-0.2417
Age25_34*post86	0.5287	0.1063 **	0.1590	0.3305	0.0841 **	0.1229
Age35_44*post86	0.3945	0.1367 **	0.1199	0.1514	0.1235	0.0569
Age45_54*post86	0.2972	0.2065	0.0908	0.3469	0.1909 *	0.1251
Age55+*post86	-0.0518	0.3231	-0.0141	-0.3195	0.3604	-0.1254

* All regressions use the basic specification. Results using the extended specification are similar.

Table 15
Estimated Loss of Retirement Wealth at Age 65 from Failure to Roll Over Distribution (1993 Dollars)

	Average Size of LSD Not Rolled Over	Average Estimated Pension Loss*
Age at Receipt		
Under 30	3,062	21,029
30-39	5,733	26,181
40-49	7,330	20,241
50-59	10,617	18,448
Household Income at Interview		
Under 10,000	4,812	15,966
10,000-20,000	5,155	22,055
20,000-30,000	4,668	19,641
30,000-40,000	3,908	19,598
40,000-50,000	6,149	24,561
50,000-75,000	5,679	23,118
75,000+	7,531	29,520

Note: Pension loss is computed assuming that amounts not rolled over would have otherwise been invested with a real return of 5 percent per year.
* The estimated pension loss is averaged over workers who did not roll all funds.
Source: Authors' calculations using the Employee Benefit Supplement of the 1993 Current Population Survey.

Appendix Table 1
Distribution of LSD Amounts: CPS & HRS

	CPS	HRS w/ top code
Percent of sample that received at least one LSD in 1975-91		
unweighted	7.8	8.9
weighted	7.7	9.4
Of those who received LSD, percent who received it in 1975-86		
unweighted	54.1	58.8
weighted	54.7	58.4
Weighted Distribution of LSD Amounts 1975-86*		
max	130,390	215,053
mean	14,306	18,419
75th percentile	16,951	20,348
median	8,723	8,796
25th percentile	2,999	3,086
Weighted Distribution of LSD Amounts 1987-91*		
max	123,504	123,456
mean	22,709	26,674
75th percentile	33,207	30,864
median	10,735	12,345
25th percentile	2,965	4,119

*Dollar Amounts in 1992 Dollars

Appendix Table 2
Eligibility for Lump-Sum Distributions in 1983 and 1988
By Plan Type and Selected Demographic Characteristics

	1983 CPS	1988 CPS		
	All Plans	All Plans	Defined Contribution Plans	Defined Benefit Plans
All Workers with Pensions	56	55	63	50
Age				
Under 35	54	53	66	46
35-44	57	56	61	52
45-54	57	55	61	52
55-64	53	56	65	51
65 and Over	57	55	65	50
Income				
Under 10,000	43	45	69	39
10,000-19,999	55	56	71	51
20,000-29,999	55	54	62	47
30,000-39,999	57	54	62	49
40,000-49,999	58	54	58	54
50,000-74,999	56	55	61	49
75,000 and Over	64	59	62	54
Males	54	53	61	48
Females	57	58	66	53
White	55	54	62	49
Nonwhite	58	58	71	55

Note: The sample is restricted to workers participating in a pension plan on their current job, and excludes respondents who report not knowing whether they would qualify for a distribution. The marginal effects, which indicate the percentage increase in probability of being eligible for a distribution, were estimated by a probit equation, controlling for age, household income, gender, race, occupation, industry, education, union status, and type of pension plan.

Source: Authors' computations of the 1983 and 1988 Employee Benefits Survey of the CPS.

Appendix Table 3
Eligibility for Lump-Sum Distributions in 1983 and 1988
By Plan Type, Education, and Employment Characteristics

	1983 CPS	1988 CPS		
	All Plans	All Plans	Defined Contribution Plans	Defined Benefit Plans
All Workers with Pensions	56	55	63	50
Occupation				
Manager/Professional	64	61	65	57
Sales/Technician	53	53	62	48
Clerical	57	56	64	51
Services	64	62	72	60
Farm/Fishing/Forestry	68	75	82	81
Craft/Production	47	44	57	38
Operator/laborer	39	45	57	40
Industry				
Agriculture/Mining/ Construction	43	46	55	40
Manufacturing	48	48	58	42
Transportation/Public Utilities/Communication	49	47	56	39
Wholesale and Retail Trade/ FIRE	48	54	64	47
Services	72	66	72	64
Education				
Less than HS diploma	45	50	65	43
HS graduate	51	52	63	48
Some college, no degree	57	54	63	50
4 yrs college completed	61	59	64	52
4+ yrs college	67	61	62	57
Covered under Union Contract	53	50	58	48

Note: The sample is restricted to workers participating in a pension plan on their current job, and excludes respondents who report not knowing whether they would qualify for a distribution. The marginal effects, which indicate the percentage increase in probability of being eligible for a distribution, were estimated by a probit equation, controlling for age, household income, gender, race, occupation, industry, education, union status, and type of pension plan.

Source: Authors' computations of the 1983 and 1988 Employee Benefits Survey of the CPS.

Appendix Table 4
Probit Estimates of Rollovers with r*, 1988 CPS

	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx
rstar				9.7541	6.2681	1.7025
Basic Specification						
educ2	0.2315	0.2771	0.0433	0.2133	0.2781	0.0396
educ3	0.4539	0.2768	0.0913	0.4371	0.2777	0.0873
educ4	0.5553	0.2858 *	0.1193	0.5415	0.2867 *	0.1156
educ5	0.3727	0.2831	0.0740	0.3642	0.2838	0.0720
income_2	0.2394	0.1866	0.0461	0.1869	0.1904	0.0352
income_3	0.3426	0.1792 *	0.0684	0.2721	0.1851	0.0528
income_4	0.2104	0.1771	0.0397	0.1907	0.1777	0.0357
income_6	0.5785	0.1678 **	0.1211	0.5781	0.1679 **	0.1208
age35_44	0.2648	0.1121 **	0.0494	0.2406	0.1133 **	0.0445
age45_64	0.4901	0.1480 **	0.1073	0.4327	0.1528 **	0.0923
age55	0.6014	0.1947 **	0.1433	0.4672	0.2156 **	0.1045
lsd_2	0.4045	0.1633 **	0.0751	0.4018	0.1634 **	0.0744
lsd_3	0.7312	0.1763 **	0.1692	0.7329	0.1764 **	0.1694
lsd_4	0.8546	0.1695 **	0.1980	0.8513	0.1696 **	0.1968
constant	-2.5975			-2.5769		
Pseudo r^2		0.1044			0.1067	
Log Likelihood		-434.9859			-433.8509	
rstar				8.0440	6.2878	1.3027
Extended Specification						
educ2	0.1982	0.2835	0.0341	0.1795	0.2843	0.0307
educ3	0.4411	0.2835	0.0824	0.4231	0.2842	0.0786
educ4	0.5407	0.2920 *	0.1082	0.5255	0.2927 *	0.1046
educ5	0.3328	0.2899	0.0608	0.3220	0.2904	0.0586
income_2	0.1062	0.1959	0.0180	0.0620	0.1994	0.0103
income_3	0.1939	0.1894	0.0340	0.1359	0.1948	0.0233
income_4	0.0439	0.1877	0.0072	0.0282	0.1881	0.0046
income_6	0.3042	0.1810 *	0.0546	0.3058	0.1809 *	0.0549
age35_44	0.2730	0.1153 **	0.0474	0.2525	0.1165 **	0.0436
age45_64	0.4703	0.1507 **	0.0957	0.4230	0.1553 **	0.0843
age55	0.6619	0.2006 **	0.1529	0.5460	0.2222 **	0.1194
lsd_2	0.3880	0.1672 **	0.0668	0.3846	0.1672 **	0.0662
lsd_3	0.7141	0.1810 **	0.1546	0.7146	0.1809 **	0.1548
lsd_4	0.7850	0.1737 **	0.1679	0.7821	0.1737 **	0.1671
intdiv_2	0.1431	0.2219	0.0249	0.1507	0.2220	0.0264
intdiv_3	0.3545	0.1853 *	0.0655	0.3554	0.1853 *	0.0656
intdiv_4	0.4784	0.1802 **	0.0925	0.4785	0.1802 **	0.0925
intdiv_6	0.6465	0.1770 **	0.1303	0.6410	0.1769 **	0.1290
ownhome	0.1500	0.1327	0.0230	0.1520	0.1328	0.0233
nonwhite	-0.6980	0.2912 **	-0.0754	-0.6845	0.2902 **	-0.0745
constant	-2.8669			-2.8469		
Pseudo r^2		0.1344			0.1360	
Log Likelihood		-420.4016			-419.6200	

*,** indicates significance at the 5% and 1% level, respectively.

Source: Authors' estimates using the 1988 CPS.

Appendix Table 5
Probit Estimates of Rollovers with LSDTax, 1988 CPS

	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx
Using Basic Specification									
LSDtax	2.7394	0.7303 **	0.4715						
LSDtax*pre87				1.6993	0.7374 **	0.2948			
LSDtax*post86				3.1403	1.0517 **	0.5448			
Inctax*pre87							2.2964	0.9148 **	0.3911
Inctax*post86							1.6442	1.3801	0.2800
age25_86							0.4697	0.2355 **	0.0996
age35_86							0.6879	0.2648 **	0.1637
age45_86							0.1670	0.3422	0.0314
age55_86							-0.5693	0.4971	-0.0663
Pseudo r^2		0.1191			0.1136			0.1265	
Log Likelihood		-427.8305			-430.4930			-424.2640	
Using Extended Specification									
LSDtax	2.6388	0.7433 **	0.4218						
LSDtax*pre87				1.5068	0.7505 **	0.2426			
LSDtax*post86				2.9662	1.0730 **	0.4776			
Inctax*pre87							2.0565	0.9280 **	0.3218
Inctax*post86							1.2545	1.4146	0.1963
age25_86							0.5031	0.2419 **	0.1008
age35_86							0.7827	0.2745 **	0.1820
age45_86							0.1450	0.3483	0.0249
age55_86							-0.6668	0.5194	-0.0657
Pseudo r^2		0.1476			0.1425			0.1583	
Log Likelihood		-414.0018			-416.4940			-408.8123	

*,** indicates significance at the 5% and 1% level, respectively.

Source: Authors' estimates using the 1988 CPS.

Appendix Table 6
Probit Estimates of Rollovers with LSDTax-RetTax, 1988 CPS

	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx	Coefficient	Std Err	dF/dx
Using Basic Specification									
LSDtax-Rettax	2.4050	0.8441 **	0.4153						
(LSDtax-Rettax)*pre87				2.3122	1.0053 **	0.3993			
(LSDtax-Rettax)*post86				2.4524	0.8877 **	0.4235			
(Inctax-Rettax)*pre87							2.2483	1.3946	0.3839
(Inctax-Rettax)*post86							-0.2470	1.5293	-0.0422
age25_86							0.3696	0.1712 **	0.0752
age35_86							0.6849	0.1952 **	0.1631
age45_86							0.1727	0.3013	0.0327
age55_86							-0.6416	0.4569	-0.0713
Pseudo r^2		0.1129			0.1129			0.1239	
Log Likelihood		-430.8672			-430.8528			-425.4936	
Using Extended Specification									
LSDtax-Rettax	2.4186	0.8623 **	0.3873						
(LSDtax-Rettax)*pre87				2.2431	1.0226 **	0.3592			
(LSDtax-Rettax)*post86				2.5147	0.9114 **	0.4027			
(Inctax-Rettax)*pre87							2.1695	1.4216	0.3398
(Inctax-Rettax)*post86							-0.3939	1.5611	-0.0617
age25_86							0.3865	0.1763 **	0.0734
age35_86							0.7619	0.2016 **	0.1758
age45_86							0.1318	0.3055	0.0224
age55_86							-0.7579	0.4808	-0.0701
Pseudo r^2		0.1426			0.1427			0.1569	
Log Likelihood		-416.4125			-416.3615			-409.4716	

*,** indicates significance at the 5% and 1% level, respectively.

Source: Authors' estimates using the 1988 CPS.

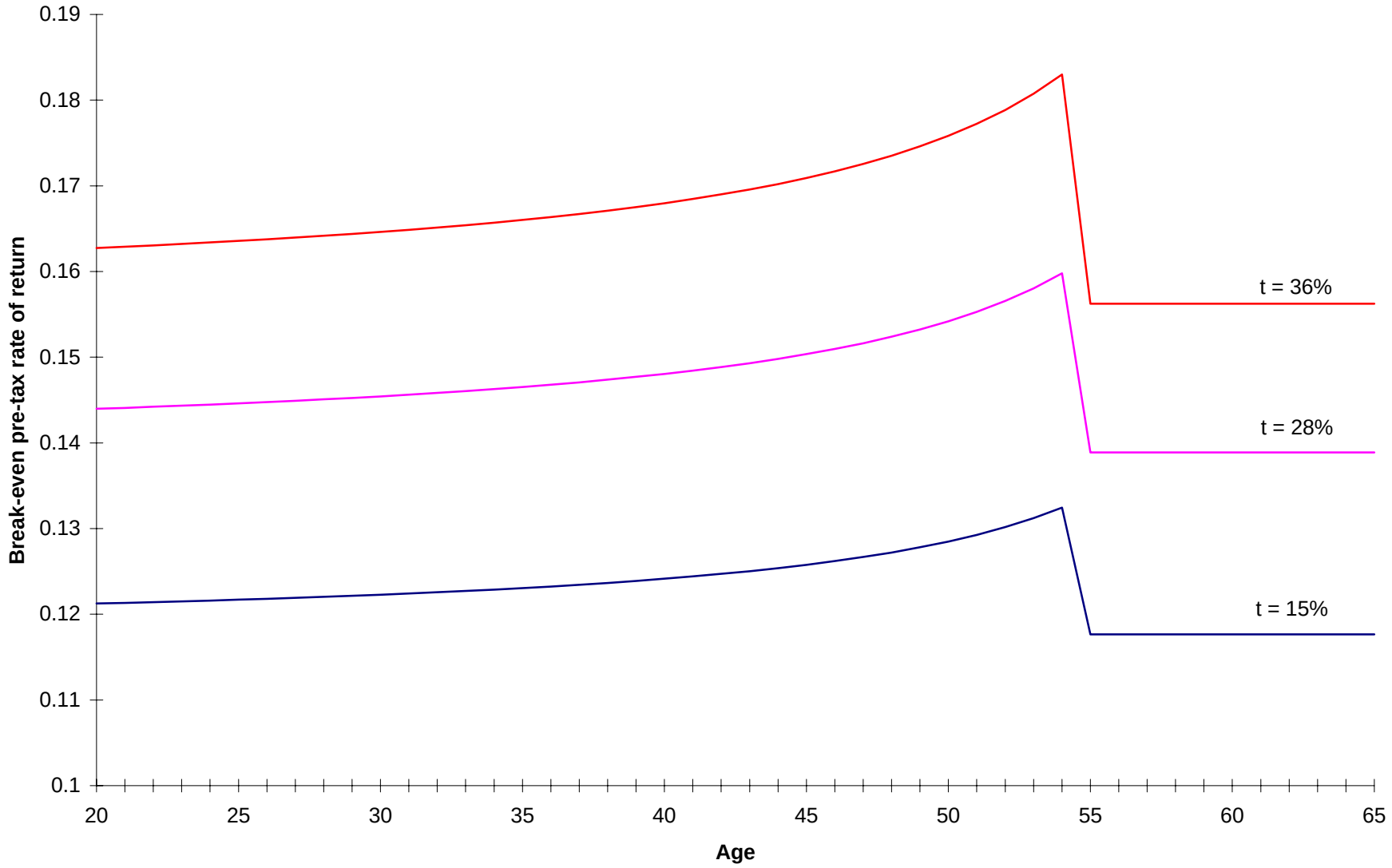
Appendix Table 7
Maximum Likelihood Estimates, 1988 CPS

	Basic Specification		Extended Specification	
ml	**coefficient**	**Std Err**	**coefficient**	**Std Err**
LSD Size Categories Included				
rstar	7.6766	6.0898	7.1883	6.1031
educ2	0.2280	0.2578	0.2217	0.2594
educ3	0.3750	0.2597	0.3869	0.2615
educ4	0.5020	0.2673 *	0.5087	0.2687 *
educ5	0.3249	0.2644	0.3505	0.2662
income_2	0.0459	0.1814	0.0518	0.1825
income_3	0.0879	0.1778	0.0908	0.1794
income_4	-0.0180	0.1703	-0.0077	0.1716
income_5	0.2714	0.1645 *	0.2461	0.1658
age35_44	0.2355	0.1088 **	0.2247	0.1096 **
age45_54	0.4839	0.1432 **	0.4666	0.1441 **
age55	0.5316	0.2052 **	0.5553	0.2067 **
lsd_2	0.3660	0.1659 **	0.3544	0.1668 **
lsd_3	0.6998	0.1790 **	0.6816	0.1802 **
lsd_4	0.7430	0.1770 **	0.7169	0.1782 **
intdiv_2	0.1932	0.1999	0.1323	0.2024
intdiv_3	0.3706	0.1667 **	0.3269	0.1682 *
intdiv_4	0.4896	0.1614 **	0.4380	0.1631 **
intdiv_5	0.6280	0.1595 **	0.5823	0.1609 **
ownhome			0.1761	0.1237
nonwhite			-0.4919	0.2341 **
constant	-2.6893	0.3178 **	-2.7488	0.3286 **
log(amtlsd93)	0.0799	0.0192 **	0.0800	0.0193 **
constant	-0.5413	0.1533 **	-0.5411	0.1545 **
Log likelihood		-567.9126		-564.1534
LSD Size Categories				
rstar	7.7295	5.9567	7.2247	5.9745
educ2	0.2302	0.2488	0.2221	0.2511
educ3	0.3680	0.2509	0.3799	0.2533
educ4	0.4663	0.2582 *	0.4741	0.2601 *
educ5	0.3510	0.2554	0.3770	0.2578
income_2	0.0352	0.1757	0.0380	0.1770
income_3	0.0902	0.1724	0.0893	0.1741
income_4	0.0151	0.1654	0.0165	0.1668
income_5	0.3112	0.1595 *	0.2764	0.1610 *
age35_44	0.3176	0.1045 **	0.3036	0.1054 **
age45_54	0.6043	0.1373 **	0.5795	0.1384 **
age55	0.7025	0.1970 **	0.7173	0.1985 **
intdiv_2	0.1677	0.1948	0.1111	0.1974
intdiv_3	0.3567	0.1614 **	0.3151	0.1632 *
intdiv_4	0.5086	0.1569 **	0.4570	0.1586 **
intdiv_5	0.6331	0.1547 **	0.5877	0.1563 **
ownhome			0.2098	0.1212 *
nonwhite			-0.5115	0.2281 **
constant	-2.2703	0.2761 **	-2.3632	0.2893 **
log(amtlsd93)	0.1124	0.0187 **	0.1112	0.0187 **
constant	-0.7920	0.1395 **	-0.7821	0.1401 **
Log likelihood		-580.4478		-575.7323

*,** indicates significance at the 5% and 1% level, respectively.

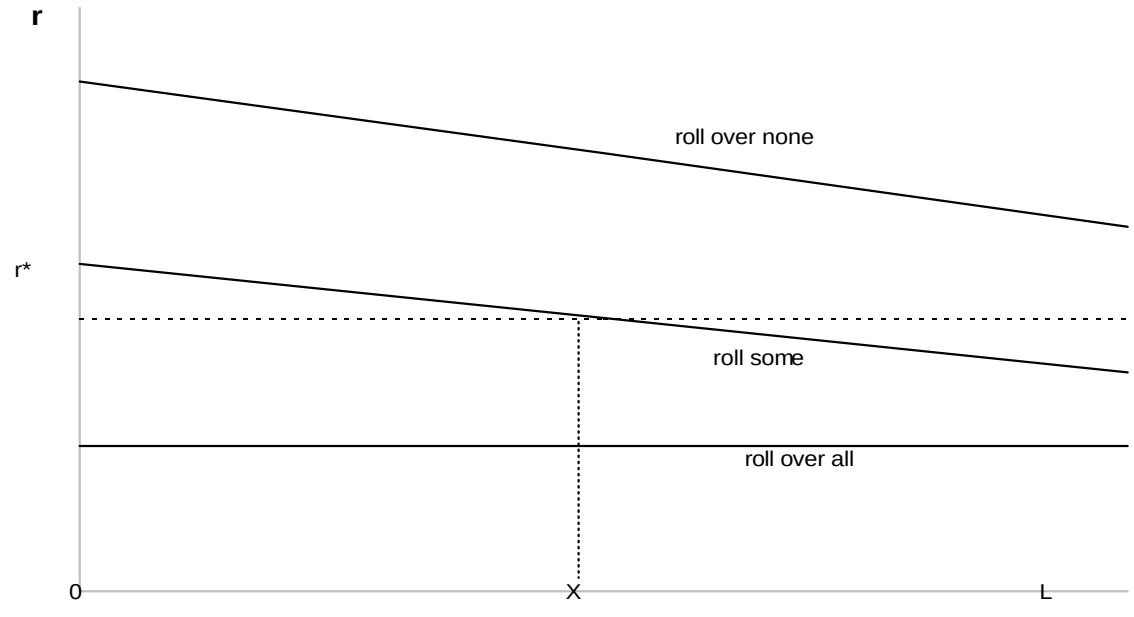
Source: Authors' estimates using the 1988 CPS.

Figure 1: Opportunity Cost by Age and Tax Rate



Assumptions: Pension assets earn ten percent, retire at age 65, ten percent penalty applies until age 55, current tax rate remains the same in retirement.

Figure 2: The Decision to Roll Over
(r variable)



Size of Distribution