Effects of Public Policies on the Disposition of Pre-Retirement Lump-Sum Distributions: Rational and Behavioral Influences

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ABSTRACT

A variety of public policies aim to influence workers' disposition of pre-retirement lump-sum distributions (LSDs) from pensions. We use the implementation of several policy changes as natural experiments to test for rational and behavioral motives for saving behavior. Using data from the HRS and the CPS in the 1980s and 1990s, we find that higher tax rates on cash-outs increase rollovers. Controlling for the overall effective tax rate, structuring the tax as a "penalty" or adding withholding taxes on cash-outs significantly increases rollovers. Allowing employers to unilaterally cash out balances for departing employees who do not make their own choice significantly reduces the effects of higher tax rates but boosts the impact of withholding taxes. These results suggest that both behavioral and rational factors influence workers' choices, that policies relating to pre-retirement cash outs can interact in important ways, and that the government has several levers at its disposal to influence behavior beyond tax penalties.

In the purely rational model of economic behavior, individuals respond to the incentives they face and they "see through" presentation and framing issues. Recent research, however, suggests that household saving behavior is not immune to presentation and framing issues (see Madrian and Shea 2001, Duflo and Saez 2003, Bertrand et al. 2005, Duflo et al. 2006, Saez 2007). The research suggests, instead, that the manner in which a policy or program is presented can have first-order effects on individuals' choices, holding economic incentives constant. This insight, if proven robust, suggests fundamental changes in modeling of saving choices, and new directions in public policies toward saving that could prove to be both effective and inexpensive.

This paper examines the importance of presentation and information, relative to and controlling for pure economic incentives, in the context of individuals' choices regarding the disposition of pre-retirement lump-sum distributions (LSDs) from their 401(k) or defined benefit pension plans. Upon changing jobs, workers may leave their vested pension balances at their old employer or take the funds as a lump sum distribution. If taken as an LSD, the funds may be "rolled over" to another qualified plan (typically, an Individual Retirement Account (IRA) or the defined contribution plan at the worker's new employer), used to purchase an annuity, or cashed out.

A variety of Federal rules aim to discourage pre-retirement cash-outs. Employees owe ordinary income tax on cashed-out funds, as with all pension benefits. They are also subject to a 10 percent penalty tax unless the account holder was older than 59.5 or the LSD was part of a job termination and the account holder was at least 55. Employers are required to offer departing employees the option of directly transferring the LSD into an IRA or other qualified plan, and to assess a withholding tax of 20 percent on balances

that are not transferred to those accounts. Working in the opposite direction, however, employers may unilaterally choose to cash out balances that are less than $1,000.[1] These policies were developed in major reforms in 1986 and 1992 and smaller reforms thereafter.

Previous research finds that a small percentage of LSD *recipients* roll all of their funds into qualified accounts, but that a larger share of *dollars* received in LSDs are rolled over. The cumulative loss in retirement income (or "leakage") from pre-retirement LSDs is relatively small compared to aggregate or average retirement wealth.[2]

Nevertheless, pre-retirement cash-outs raise concerns. The households who are more likely to cash out their LSDs tend to be younger, have lower income, have smaller accumulated balances, and have lower "tastes for saving" or financial sophistication, as proxied by less education, less interest income, or lack of IRA ownership. These characteristics tend to be shared by households that appear to be saving too little for retirement (Engen, Gale, and Uccello (1999), Hurst (2003), Scholz, Seshadri, and Khitatrakun (2006)) and by households for whom pension or 401(k) saving actually represents an increase in wealth rather than a shifting of assets from taxable to the tax-preferred form (Benjamin (2003), Engelhardt and Kumar (2007), Engen, Gale, and Scholz (1996), Poterba, Venti and Wise (1996)). Moreover, in light of the ongoing debate about the extent and nature of undersaving for retirement, the continued growth of

[1] See Munnell and Lee (2004) for a discussion of changes through 2004. The maximum balance at which an employer may unilaterally force an LSD rose from $1,750 to $3,500 in 1984, and to $5,000 in 1998. Effective 2005, employers were required to rollover into an IRA any involuntary cash-outs larger than $1,000. *Congressional Quarterly Almanac* 1984 (pp. 163-165). *U.S. Master Tax Guide 2007* (Para 2188).

[2] See Andrews (1991), Burman, Coe, and Gale (1999), Chang (1996), Engelhardt (2001), Fernandez (1992), Gustman and Steinmeier (1998), Hurd, Lillard and Panis (1998), Korczyk (1996), Poterba, Venti, and Wise (1998, 1999), Sabelhaus and Weiner (1999), Scott and Shoven (1996), and Yakoboski (1997).

defined contribution plans – where pre-retirement cash-outs are more widely available – and the increasing long-term pressures on the federal budget, a better understanding of how public policies affect LSD choices is essential to developing a retirement income system that can adequately address the needs and constraints of the modern work force and economy.

In this paper, we provide new theory and evidence on how public policies affect the disposition of workers' pre-retirement LSDs. We develop an explicit model of rational behavior regarding pre-retirement LSD choices, and show that all of the major empirical patterns regarding LSDs identified in the literature and discussed above are consistent with rational choice.[3] We use the 1986 and 1992 reforms as natural experiments to identify the effects of policy changes. We explicitly model the tax treatment of LSDs from 1981 to 1992 and estimate how the substantial tax changes enacted in 1986 affected the disposition of LSDs.[4] We also examine the effects on LSD choices of the 1992 tax withholding rules, which have no impact on net tax liability. In addition, we explore interactions between policies, an important consideration when several policies operate simultaneously.

Consistent with both rational and behavioral models, we find that higher effective tax rates on LSDs reduce cash-outs. Several additional results, however, only make sense in a behavioral framework. First, holding the effective tax rate constant, structuring some of the tax as a "penalty" appears to have a positive impact on rollovers. Second, a

[3] We are aware of no previous formal theoretical modeling of pre-retirement LSD disposition choices. Hurd and Panis (2002) model the annuitization of LSDs at the time of retirement.

[4] Despite the substantial number of analyses of the individual determinants of LSD behavior (see footnote 1), only Chang (1996) has examined the effects of tax policy changes. Chang (1996), however, uses the ordinary income tax rate plus any withdrawal penalties to proxy for the effective tax rate on LSDs. In practice, the effective tax rate can vary substantially from that calculation.

withholding tax on funds that are not rolled over directly from one account to another – which does not affect ultimate tax burdens, but which makes the tax features more salient at the time of the rollover decision – has a significant impact on cash-out behavior.

Third, the specification of default rules for whether the employer can cash out the balance has substantial impacts on the relative effectiveness of tax rates, tax penalties and tax withholding rules. In particular, when the employer can unilaterally cash out the balance if not otherwise instructed, conventional tax rates and tax penalties (such as those imposed in 1986) that individuals face at the time of income tax filing (which occurs much later than the separation decision) have little effect on rollover behavior; presumably because the employer has already acted by the time the individual focuses on the tax consequences. In contrast, when the employer can unilaterally cash out the balance if not otherwise instructed, the presence of withholding taxes imposed immediately on non-rolled over funds (such those enacted in 1992) have an increased positive effect on rollovers – even when the withholding tax has no net effect on tax burdens. This presumably occurs because the withholding tax makes the tax consequences salient to the individual at the time the rollover decision has to be made and so prods the individual to act before the employer makes a unilateral decision.

The findings confirm and extend previous research noted earlier showing that economic incentives significantly affect behavior, and that – holding such incentives constant – relatively small changes in the presentation of an incentive can also have first-order effects on economic behavior and the effectiveness of the policy. The results also suggest the importance of understanding interactions among policies that operate simultaneously.

Section I presents and discusses a simple, rational model of LSD choices. Section II describes the data. Section III discusses changes in tax and other policies toward LSDs over time and the construction of effective tax rates on LSDs. Section IV presents descriptive patterns of LSD choices. Section V presents regression results. Section VI concludes.

I. A Rational Model of the Disposition of Lump-Sum Distributions

To start, consider a simple, rational model of LSD behavior. A worker seeking to finance a given consumption expenditure could finance the expenditure by taking a $1 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. Alternatively, she could withdraw $(1-\tau_0-\pi)$ from a taxable saving account or borrow the same amount. Suppose her pension pays a pre-tax return of r_p and the after-tax opportunity cost of funds (i.e., the interest rate on saving and borrowing) is r.[5] In terms of retirement consumption (assumed to be N periods in the future), the cost 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 (taxable saving accounts or borrowing) is $(1+r)^N(1-\tau_0-\pi)$. The net gain from taking the cash as an LSD from the pension versus tapping taxable saving or borrowing is

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

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

[5] To simplify exposition, we assume perfect certainty about future rates of return.

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

The resulting decision rule is simple: 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 alternative source than tapping into retirement funds. Formally, this is given by:

(3) Roll over none (withdraw all) if $r(0) > r^*$

Roll over all (withdraw none) if $r(L) < r^*$.

Equations (2) and (3) generate comparative static results that are consistent with the key empirical findings in the literature cited above. Increases in the penalty rate (π) raise the likelihood of rolling over LSDs. Younger households will be more likely to cash out LSDs, since r^* falls as N grows (larger N representing a younger person). Higher-income households will be less likely to cash out funds because r^* rises with the current tax rate (even if the retirement tax rate rises by the same amount) and they also tend to face lower costs of funds, r. Taxpayers with stronger tastes for saving are likely to have more assets and thus have access to sources of financing with low net opportunity costs, such as home equity loans. In addition, they are likely to be better credit risks, which lowers the interest rate they must pay to borrow. For both reasons, such households would face a low r and would be less likely to cash out the pension.

With convenient assumptions about functional form, this simple model of rollover behavior may be estimated with a probit model. Substituting (2) into (3), the decision

rule may be written in terms of an indicator function,

$$\Omega = \ln(1+r) - \ln(1+r_p) - \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right),$$

where the rollover will occur if Ω is negative and withdrawal if Ω is positive. The rates of return, r and r_p are unobservable. If we assume that

$$\ln(1+r) - \ln(1+r_p) = Z\beta + \varepsilon$$

where Z is a vector of exogenous variables and $\varepsilon \sim N(0,\sigma)$, then (3) can be written as

(4) Roll over none (withdraw all) $\quad$ if $Z\beta - \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right) + \varepsilon < 0$

Roll over all (withdraw none) $\quad$ if $Z\beta - \frac{1}{N}\ln\left(\frac{1-\tau_N}{1-\tau_0-\pi}\right) + \varepsilon > 0$

Equation (4) can be transformed into a probit by dividing through by σ.

The specification above does not allow for partial rollovers. To introduce partial rollovers, we allow r to rise with the size of the LSD. This is consistent with the idea that an optimizing consumer would finance expenditures from the least expensive sources first (home equity, passbook saving), and tap into more expensive sources (credit card debt, cash out from a pension) only when the cheaper alternatives are exhausted. With this assumption, it is easy to show that partial cash-outs are more likely for larger LSD balances, consistent with the empirical evidence. This full model can be estimated by maximum likelihood methods (see the Appendix).

The models discussed above are based on fully rational behavior. In these models, the rollover choices depends on effective tax burdens and individual characteristics. The rollover choice does not depend on policies that alter the

presentation of effective tax rates, but do not alter the actual effective rate itself. Such policies include whether employers can unilaterally cash out funds, the presence of withholding taxes that do not affect overall tax burdens, or the presence of "penalties" versus ordinary income tax rates in the composition of the effective tax rate. Evidence that such factors influence LSD choices would suggest that factors beyond those discussed in the rational model could be important policy levers.

II. Data

To examine these issues empirically, we use data from the Current Population Survey (CPS) and the Health and Retirement Study (HRS), as well as information on tax, withholding, and other policy rules regarding LSDs.

The Employee Benefits Supplement (EBS) to the 1993 Current Population Survey was administered to a nationally representative subsample of individuals who, at the time of the interview, were employed and/or were between 25 and 64 years old. Respondents were asked if they had ever received an LSD from a previous job. If they had, they were asked about the type of pension involved, the year, amount, and the use of the funds.[6] We focus on uses that preserve the funds for retirement, maintain the tax-preferred status of the funds and hence do not trigger a tax penalty. Thus, we count the use as a "rollover" if the respondent rolled all of the funds into an IRA or purchased an annuity. If the respondent used any of the funds for other purposes, we count the entire transaction

[6] The LSD amount was top-coded at $100,000, but very few people were at the limit. We deleted one observation with a reported distribution of $99,999, which we suspect was an error in coding. The code for one of the "other uses of the LSD" was 999,999 and we saw no plausible way the respondent in question could have accumulated such a large amount of funds. When appropriate, LSD amounts were converted to 1993 dollars using the CPI-U index.

as a non-rollover. Very few respondents reported multiple uses of the funds and the results presented below are not sensitive to whether partial rollovers are counted as rollovers or non-rollovers, or are excluded from the sample. By matching the EBS to the March 1993 CPS, we collect information on the respondents' age, level and composition of income, gender, race, education, marital status, and homeownership status.

We use data from the 7 waves of 1992-2004 Health and Retirement Study (HRS).[7] The initial 1992 HRS sample was drawn from households with heads born between 1931 and 1941, with oversamples of Blacks, Latinos, and Florida residents. Subsequent waves, implemented every two years, have expanded the HRS panel to include households with heads born between 1890 and 1953. The HRS data largely parallels the information obtained from the CPS. HRS respondents are asked about the year, amount, and use of LSDs from previous jobs and the type of pensions involved. We follow the procedure used with the CPS data. We distinguish between uses that preserve the tax-preferred and saving status of the funds – now broadened to include rolling over the funds (directly, or after an LSD) into an IRA or defined contribution plan; leaving the funds in the employer's plan; purchasing an annuity; or receiving pension benefits – from other uses. If any of the funds are used for non-tax-preferred purposes, we classify the transaction as a non-rollover; as in the CPS data, however, the HRS results are not sensitive to alternative treatments of the small minority of individuals who choose more than one use. We supplement the LSD information with data on household income, and the age, gender, race and educational attainment of the head.

[7] We use the RAND version of the HRS, a cleaned and merged version of waves 1-6. We apply the variable definitions from the RAND file to the HRS data to create a comparable version of wave 7. The raw HRS files and the RAND data are available to registered users at https://ssl.isr.umich.edu/hrs/. Additional information about the HRS is provided at http://hrsonline.isr.umich.edu/.

Unlike in the CPS, however, these controls reflect current conditions at the time of the survey where the job separation is reported.

Several additional differences between the CPS and HRS data are worth noting. Our analysis of the HRS data examines the disposition of defined contribution plans only. We draw most of our data from respondents' reports of job separations that occurred before they entered the panel, and these sections do not report whether an individual was offered an LSD option. Since LSD options are uncommon among DB plans, but nearly universal among DC plans, we assume that all DC participants had an LSD option and ignore respondents with DB plans.[8] This approach to measuring LSD choices gives rise to another difference between the two data sets: workers who leave their account balances with their previous employers appear in the HRS, but not in the CPS. Since leaving the funds at the previous employer is essentially a way to preserve DC balances for retirement, the HRS therefore shows higher rollover rates across the board, even though trends are very similar in both surveys. Chang (1996), Engelhardt (2001), and Hurd and Panis (2002) find that between 10 and 18 percent of employees who have the option choose to leave their pension at their previous employer when changing jobs. Appendix Table 1 reports relevant descriptive characteristics for the CPS and HRS samples.[9]

[8] In addition to the retrospective sections where we gather most of our data on LSDs, the HRS reports information on any pensions a respondent might participate in at his current job, including whether that plan offers an LSD option. In waves 1-3 of the HRS, more than 80 percent of DC participants report an LSD option for their current plan, compared to about 40 percent among DB participants (Hurd and Panis 2002).

[9] The CPS appears to under-report LSD aggregates. The CPS records LSDs of about $20 billion in 1992. Alternative estimates, using a variety of data sources including tax records, place the total at about $75-80 billion (Woods 1996, Yakoboski 1997, Sabelhaus and Weiner 1999). Nevertheless, patterns of LSD disposition with respect to age and income appear to be similar in the tax records and the CPS data.

We use the CPS data on LSDs received from 1981 through 1992 to examine the effects of the 1986 policy changes. We use the HRS data on LSDs received from 1987 through 1997 to examine the impact of the 1993 changes. These policies are described in the next section.

III. Policies Affecting LSDs

Before 1974, LSDs were taxed as long-term capital gains. The Employee Retirement Income Security Act (ERISA), enacted in 1974, 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 at least 5 years of job tenure when the LSD occurred. The pre-1974 amount could be treated as capital gains, or it could be treated as ordinary income. The post-1973 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 (from the pre-1974 or the post-1973 portions) could be subjected to 10-year income averaging. For our purposes, a convenient feature of income averaging is that it is based on the tax schedule for single taxpayers; to determine the tax rate, the only information needed is the LSD amount and year it was received. For the years 1980 to 1986, we calculate the tax rate assuming that LSD recipients in the CPS take the special 10-year averaging rule to determine their tax rate.[10]

[10] This procedure is justified if two conditions hold: (i) the LSDs reported in the CPS were based on job tenures of 5 years or more, and (ii) income averaging was preferable to taxation as ordinary income for those recipients. To gauge whether the LSDs reported in the CPS are 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 were 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 2 shows that the HRS and CPS report similar numbers and magnitudes for LSD for the same age cohorts (when the HRS data are top-coded to match the CPS top codes). To test the second condition, we examined hypothetical taxpayers in different years (1980 and 1986), income levels

The Tax Reform Act of 1986 made several significant changes in the taxation of LSDs. Cash-outs were subject to a 10 percent penalty tax unless the account holder was older than 59.5 or the LSD was part of a job termination and the account holder was at least 55.

For workers younger than 50 as of January 1, 1986, LSDs were taxed as ordinary income (in addition to the penalty). For these households, we "back-cast" the income level reported in the 1993 CPS to the year or LSD receipt, using aggregate personal income growth rates between the year when the LSD was received and 1993. We reduce each component of income by the same proportion and calculate the marginal federal income tax rate in the year of LSD receipt, given the marginal tax rate schedules in effect in that year. We assume the household took the standard deduction and had the same marital status and number of children as in the 1993 CPS and account for EITC phase-in and phase-out ranges.

Those over 50 years old as of January 1, 1986, could elect to designate the entire taxable cash-out as ordinary income or could divide it between a pre-1974 portion, which would be taxed at a flat 20 percent rate, and ordinary income. In either case, the amount designated as ordinary income could be taxed under either 5-year averaging (using the current-year tax schedule for singles) or 10-year income averaging (using the 1986 tax schedule for singles). Notably, for these households, we can calculate the tax rate on LSD income without reference to overall income, deductions or filing status.[11] For each

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(half-median, median and twice median income), LSD sizes (from $500 to $100,000), filing status (single and married filing jointly) and ages (25, 35, 45, 55 and 65). For virtually every situation modeled, 10-year averaging was preferable to taxing some of the funds as ordinary income and the rest as capital gains (results available upon request). Thus, both conditions appear to hold.

[11] To qualify for these tax options, the LSD recipient had to be at least 50 years old and had to be have been in the plan for 5 or more years. Based on the calculations comparing the CPS and HRS described earlier in

LSD recipient, we calculate the tax all four ways and choose the low-tax option.

To calculate r* in equation (2), we also need estimates of the tax rate in retirement (τ_N). For LSDs before 1987, we assume the household faces the same tax rate on LSDs in retirement as it does during the working years. This is plausible since, as described above, the taxation of LSDs during that period did not depend on family income, only on the size of the LSD. For LSDs after 1986 by households older than 50 as of January 1, 1986, we make the same assumption using the same rationale. For LSDs received after 1986 by households younger than 50 as of January 1, 1986, we estimate tax rates in retirement by assuming that recipients would remain in the same age-adjusted percentile of the CPS sample income distribution, and would retain their current marital status through retirement. We then assign each recipient the income level corresponding to his/her percentile of the 65-69 year old income distribution from the 1993 CPS and in turn compute a baseline level of taxable income, accounting for marital status and the over-65 standard deduction. On the basis of 1993 tax law, we then calculate the increase in tax liability that would result from receiving the LSD at this projected income level. The retirement tax rate is the ratio of estimated tax on the LSD to the amount of the LSD.

In other calculations needed to generate estimates of r*, we define N as equal to 65 minus the age when the LSD was received, and r_P, the nominal pre-tax rate of return, as 8 percent.

Besides the changes in effective tax rates on LSDs described above, policy makers have enacted a series of changes in rules regarding cash-outs and withholding

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the text, our analysis assumes that all households who cashed out LSDs and who were older than 50 in 1986 also had been in the plan for at least 5 years. To the extent that this assumption is incorrect, our estimates will understate the impact of LSD tax changes on behavior.

taxes. Importantly, for our purposes, there were no change in effective tax rates associated with these changes.

Starting in 1984, firms were allowed to cash out accounts on a unilateral basis (i.e., without the departing employee's approval) if the balance was below $3,500. This provision relieves plan sponsors of the responsibility for managing small accounts for former workers. But it does not make it more difficult for workers to choose a rollover. If the firm tells the worker that it is cashing out the pension (i.e., choosing not to manage the account anymore), the worker can still elect to roll the funds into a tax-preferred account either directly or after receiving a cash distribution.[12]

As of 1993, any qualified plan with a cash-out option had to offer recipients the option of rolling over their balances directly to another qualified plan or an IRA, and a 20 percent withholding tax was imposed on any balances that were not directly rolled over to such accounts.[13] These changes have remained law since 1993.

IV. Descriptive Patterns

A. CPS

[12] Our sample period ends in 1997, a cutoff date motivated by the 1998 adjustment of the involuntary cash-out limit from $3,500 to $5,000. The default disposition of a mandatory cash-out between $1,000 and $5,000 was changed to an IRA rollover effective 2005. Also, as of 2000, any form of capital gains treatment was eliminated for recipients born after 1935 (those who were 50 and older as of January 1, 1986). Sources: *Congressional Quarterly Almanac 1997* (pp 7-28 to 7-29). *U.S. Master Tax Guide 2001* (Para. 2153). 2005 change: *U.S. Master Tax Guide 2007* (Para. 2188).

[13] Employees who elect to receive the distribution and then transfer it into a qualified account themselves may still make supplementary contributions up to the amount withheld, which is excluded from gross taxable income so that the entire balance can in effect be transferred to a qualified account even if the transfer is not done directly. If, however, this self-directed rollover does not take place within 60 days of the distribution, the amount withheld is added back into gross income. Individuals who intend to roll over their balances but do not choose direct rollover thus have to finance the last 20 percent of the rollover out-of-pocket in order to preserve the tax-preferred status of their balances. Source: *U.S. Master Tax Guide 1994,* Para 2188.

Table 1 reports rollover rates and measures of the cost of cashing out an LSD over time and across age groups.[14] The few households that report rolling over some but not all of their LSD are classified as not having rolled over the funds. Using the CPS data, the cost of cashing out an LSD rose after 1986 by large amounts for recipients between ages 25 and 54, but by relatively small amounts for recipients aged 55 to 64.[15] For example, the first row shows that, after 1986, policy changes raised r^* – as defined by (2) and parameterized as discussed above – by 3 times as much for households younger than 55 as it did for households older than 54.

Because r^* is a complicated amalgam of several items, it may be difficult to interpret these results. In addition, r^* may not be the most salient aspect of tax policy toward LSDs; in a behavioral model, for example, the current tax burden on cash-outs and/or its designation as a tax or penalty could affect behavior. For these reasons, we also present results for the current tax rate on cash outs ($\tau_0+\pi$) and the current rate less the retirement tax rate ($\tau_0+\pi-\tau_N$). These measures of tax policy changed in the same relative manner as r^*, with larger increases for younger households after 1986. For recipients younger than 55, the current tax rate rose by 20 percentage points and the difference between the current and retirement tax rates rose by 12 percentage points. For recipients

[14] We use the sampling weights provided in the CPS and HRS for all tables in the paper. The CPS weights are constructed to scale the EBS, which is administered to a subsample of the CPS, to the national aggregates observed in the full CPS sample. The HRS requires weighting because it oversamples several demographic groups. The HRS covers only certain birth cohorts and is a panel data set. The HRS weights for each wave scale to CPS-reported aggregates for the surviving population of the relevant birth cohorts at the time of the survey. Because our cross-section is drawn from all 7 waves, there is no "true" population that our weights scale to (due to demographic change over the course of the panel.) We assign each respondent the sampling weight from the latest wave in which he appears, which for most of our sample is Wave 7 (reference year 2003). Unweighted data and estimates do not differ importantly from weighted numbers shown in the text.

[15] Treating 25-54 year olds as a single group is a useful simplification. Each of the 25-34, 35-44, and 45-54 year old groups experienced similar increases in LSD tax rates (19.3, 21.0, and 21.2 percentage points, respectively) and other tax measures, and relatively similar increases in rollover probabilities (7.4, 13.9, and 12.4 percentage points, respectively).

older than 54, the increases were just 2 and 3 percentage points, respectively.[16]

Changes in the probability of rolling over an LSD are broadly consistent with the changes in tax rates. As shown in the fourth row, after 1986, the likelihood of rolling over an LSD rose by 11 percentage points among recipients younger than 55 and fell by 23 percentage points among recipients older than 54.

As noted above, starting in 1984, employers could unilaterally cash out LSDs with balances of $3,500 or less. Table 1 reports tax rates and rollover behavior for LSDs with balances above and below that threshold, with three interesting results. First, consistent with the research cited earlier, the likelihood of rolling over an LSD is lower when smaller balances are at stake. Second, the cost of cashing out large and small LSDs changed by very similar amounts after 1986. For recipients younger than 55, the current tax rate rose by 22 percentage points for large LSDs and 18 percentage points for small LSDs.[17] Third, despite the similar changes in taxation of large and small LSDs after 1986, rollover behavior sharply diverged. For large LSDs, the likelihood of rollover rose by 19 percentage points among recipients younger than 54. For small LSDs, the likelihood of rollover increased by just 2 percentage points for recipients aged 25-54.

B. HRS

Table 2 examines rollovers in the HRS data for 1987 to 1997. Consistent with the treatment in the CPS, we classify the few households that report rolling over some but not all of their LSD as having not rolled over the funds. The HRS rollover probabilities are

[16] Chang (1996) finds a much smaller increase (3 percentage points) in the mean LSD tax rate among recipients under 55, and finds a decrease of 5 percentage points among older recipients. Our estimates apply the tax laws applicable at the time, as described above. Chang uses the marginal statutory tax rate on ordinary income.

[17] Very few workers over 55 had balances of $3,500 or less, so we omit these workers when we cut our sample by size of LSD.

higher than the corresponding CPS values; one reason is that the HRS contains information on funds left at a prior employer**,** whereas the CPS does not (as discussed above). After the 1993 policy changes, the probability of rollover increased by 11-13 percentage points in each age group. The probability of rollover rose by 26-31 percentage points for recipients with small LSDs, but by just 5-9 percentage points for recipients with large LSDs.

C. Summary

The descriptive data above frame the key questions we address below. First, the cost of cash-outs rose substantially after 1986 for recipients aged 25-54 but not for those aged 55-64. Rollover behavior changed in similar ways, rising for those younger than 55, falling for those above age 54. Thus, one set of questions revolves around the extent to which the tax policy changes in 1986 were responsible for the changes in rollovers, and, if so, which elements of the tax changes mattered most.

Second, although the overall probability of a rollover rose after 1986 and 1992, and although large and small LSDs faced similar increases in effective tax rates after 1986 and similar changes in withholding rules after 1992, rollover trends for large and small LSDs diverged sharply. As Figure 1 shows, after 1986, rollovers of large LSD rose significantly, while rollovers of small LSDs were essentially unchanged. After 1992, rollovers of small LSDs increased substantially, while the increase in rollovers for large LSDs was smaller in absolute value and mixed in sign. A second set of questions, therefore, relates to why recipients of large LSDs reacted so differently compared to recipients of small LSDs.

V. Regression Results

A. Effects of the 1986 changes

Table 3 reports the results of probit and OLS regressions using CPS data for the years 1981 to 1992. In each regression, the dependent variable takes the value 1 if the respondent rolled over the entire LSD into an IRA or qualified account or used it to purchase an annuity, and 0 otherwise. The independent variables include dummies for educational attainment, the age-adjusted quintile of total family income, the age-adjusted quintile of interest and dividend income, homeownership, race, age when the LSD was received, and an indicator for whether the LSD was received after 1986.[18] For continuous variables, the table reports marginal effects evaluated at the sample mean. For discrete variables, the table reports the effect of a change in the variable from zero to one, with all other covariates set to sample means.[19] The regressions differ in the specification of tax variables, as discussed below.

(i) All LSDs

We focus initially on the first and fourth columns of the table, which report probit and OLS results for LSDs of all sizes. These equations are represented by $R = X\beta_1 + T\gamma_1 + \varepsilon$, where R is the rollover decision, X is the independent variables listed above, T is a vector of tax variables. In Regression 1, T is represented by the variable r*, defined

[18] To determine the age-adjusted quintiles for income, households are divided into 5-year groups (25-29, 30-34, etc.) and ranked within their respective group.

[19] We have also estimated the maximum-likelihood model described in the Appendix. Unlike the probit or OLS regressions in table 3, the maximum likelihood estimates allow for partial rollovers (which are treated as cash outs in the probit/OLS regressions) and account for the amount of the distribution that is rolled over. The MLE estimates for r* gave very similar implications to the probit/OLS estimates. The MLE predicts an increase in rollovers of 6 percentage points due to the 1986 changes. As discussed in the text, the probit in equation (1) predicts a change of 5 percentage points. Since the results are so close, and since there are very few partial rollovers in the data, we focus on the probit/OLS results.

above. The coefficient on r* is statistically significant and the marginal effect implies that the 1986 changes raised the number of rollovers by approximately 5 percentage points.[20] Regression 2 replaces r* with the current tax rate (including any penalties that apply) on cash out. Raising the current tax rate by 10 percentage points raises the probability of rollover by 7.0 percentage points. As shown in Table 1, the 1986 tax changes raised the current tax rate by 20 percentage points for households between the ages of 25 and 54; thus, they would be estimated to have raised rollover rates by 14 percentage points. Regression 3 replaces the current tax rate with the difference between the current tax rate on LSDs and tax rate that is projected to occur in retirement. The coefficient on this variable is not significantly different from zero. As shown below, the imprecision of the estimate partly reflects heterogeneous responses among respondents with different account sizes.

Taken together, the first three regressions suggest that the 1986 changes in the effective tax rate on cash-outs may have increased the likelihood of rollover, but the evidence is not overwhelming. This result is consistent with rational models of behavior, since the incentive changed, *and* with behavioral models, since a "penalty" was imposed.

(ii) Penalties

A related question is whether, holding the effective tax rate constant, labeling part of it a "penalty" has a different effect than labeling it a "regular" tax rate. In a purely rational model, the label should have no effect; in a behavioral model, the stigma of being forced to pay a "penalty" may have an added deterrent effect on cash-outs, even after controlling for the current tax rate (which already includes the penalty).

[20] The coefficient patterns for other independent variables are similar to those in previous research, much of which uses the CPS, and are not reported here.

This question is addressed in regressions (4) through (6). In these regressions, T is given by the same tax variables as in regressions (1) through (3) and a penalty dummy that takes the value of 1 for recipients between the ages of 25 and 58 in years after 1986. In each regression, the penalty dummy has a large and statistically significant effect. These results imply that, *holding the overall effective tax rate constant*, constituting some of the effective tax rate as a 10 percentage point "penalty" rather than a change in "regular" tax rates raised rollovers by 16 to 24 percentage points. These large and significant estimates of the effect of the penalty tax, when controlling for the overall effective tax rate, support a behavioral model of LSD choices, rather than a fully rational one.[21]

(iii) Large and Small LSDs

Table 1 and Figure 1 show that, although tax rates changed similarly for large (>$3,500) and small LSDs after 1986, rollover patterns differed sharply. These results are robust to regression analysis. Columns 2-3 report the results of a probit regression of the form $R = X\beta_2 L + T\gamma_2 L + X\beta_3(1-L) + T\gamma_3(1-L) + \varepsilon$, where L = 1 for LSD balances above $3,500 and 0 otherwise. Column 2 reports probit estimates of γ_2. Column 3 reports probit estimates of γ_3. Columns 5 and 6 report similar results for OLS specifications.

In regressions (1) through (3), the tax variables have positive and significant effect on rollovers of large LSDs. In the first two specifications, the coefficients on the tax variables are 30-40 percent larger for large LSDs (in columns 2 and 5) than for all

[21] Another possibility is that none of the three alternative specifications used in (4)-(6) captures the true effective tax rate that taxpayers face and therefore that rejection of the rational model is founded on an invalid representation of that model. By using three alternative measures of tax rates, we hope to guard against this potential problem.

LSDs (in columns 1 and 4). The coefficient in regression (3) is several times as large for large LSDs as it is for all LSDs and is estimated precisely. All of the estimates imply that rollovers of large LSDs are sensitive to tax considerations. In contrast, the point estimates for small LSDs (in columns 3 and 6) are uniformly negative and not significantly different from zero; the regressions show no evidence that the substantial tax changes enacted in 1986 had any impact on the rollover of small LSDs. The p-value for the difference in effects for large and small LSDs is reported in brackets below the estimates. In all three regressions, the differences are significant at conventional levels, with p-values ranging from .002 to .050.[22] When the penalty dummy is added in regressions (4) through (6), consistent results obtain: the penalty raises rollovers of large LSDs by 16-32 percentage points (columns 2 and 5).[23]

These results indicate substantial differences between rollovers of large and small LSDs in response to the tax changes in 1986. Given the similar changes in effective tax rates, the source of the differing behavior must be sought elsewhere. One possibility is that allowing employers to act unilaterally in making a rollover decision for small LSDs dulls the effects of tax incentives for that group. One reason the employer decision might dominate the tax effect is that, even with the 1986 changes, workers are not forced to confront the tax implications of their choices until they file taxes the year after job separation. In contrast, the employer likely would have acted at the time of the job separation. If this hypothesis is correct, then imposing withholding taxes (which do not

[22] We estimate the p-value using a slightly adjusted specification: $R = X\beta_2 L + T\delta_2 L + X\beta_3 (1-L) + T\delta_3 + \varepsilon$. These estimates recover the same effects as in the regressions reported in the text, but make it easier to read off the p-value of the difference as simply the p-value of δ_2.

[23] We can not estimate the penalty regressions for small LSDs because the very small sample of 55-64 year olds with small LSDs before 1986 (n=3) introduces extreme multi-collinearity between the post-1986 variable, the age 55-64 variable, and the penalty variable.

change the actual tax consequences of a decision, but may serve to make the tax consequences salient at the time of the rollover decision) should have a significant impact on the rollover of small LSDs. We examine that hypothesis below.

B. Effect of the 1992 Withholding Changes

To examine the impact of the 1992 withholding changes, we use data from the HRS. For a variety of reasons, however, it is more difficult to calculate r* or the current tax rate that applies to LSD choices using the HRS data than in the CPS. As a result, in the HRS analysis, we focus on variation in the effective tax rate on LSDs that is induced by variation in age of the recipient at the time of the LSD receipt, and the year of the LSD receipt, controlling for other factors. Table 1 shows that there are substantial variations in the effective tax rate on LSDs based on these factors in the 1981-92 period.

First, we show that this procedure generates plausible results using the CPS. We replace the tax and penalty variables in the CPS data with interaction terms between age group and year of LSD receipt. That is, we estimate regressions of the form $R = Z\alpha_0 + \alpha_1(age<55) + \alpha_2(age>55) + \alpha_3(age<55)(year>1986) + \alpha_0(age>55)(year>1986) + \varepsilon$, where age<55 (age>55) are dummies that take the value 1 if the LSD recipient was 55 or younger (older than 55) and 0 otherwise, and year>1986 takes the value 1 if the LSD was received in a year after 1986 and 0 otherwise. Z is the X vector used in Table 3, but with age and year variables omitted. The results of this regression (shown in the first two rows and in columns 1 and 4 of Table 4) show that after 1986, rollovers of all LSDs in the CPS rose by 12-13 percentage points among 25-54 year olds and did not change significantly for 55-64 year olds. In columns 2-3 and 5-6, we interact the variables above with LSD size, as in table 3. For LSD recipients aged 54 or younger, the change in rollover

behavior after 1986 was much larger for large LSDs (shown in columns 2 and 5) than for small LSDs (shown in columns 3 and 6) and the difference is significant at p-values of .01 or less. This is consistent with the results in Table 3.[24]

The second regression in Table 4 reports regressions using the HRS from 1987-97. The regressions control for educational attainment, age-adjusted quintile of household income, race, and year of LSD receipt.[25] The 1992 changes raised rollovers by roughly 12 percentage points among 35-54 year olds and by about 10 percentage points among 55-64 year olds. Thus, the withholding rules appear to have had their intended effect. This supports the behavioral model in two ways. First, the change in law made it easier for individuals to rollover since all companies were required to offer a direct rollover. Second, the withholding tax rule did not actually change the tax burden for rollovers and only affected it minimally (through the timing of the tax payment) for those who cashed in. The rational model developed above implies little impact on rollover behavior from such changes.

Interestingly, the effects again differ between large and small LSDs, but in this case, rollovers of small LSDs are much *more* responsive to the change than rollovers of large LSDs. Recipients of small LSD balances raised their rollovers by 23-30 percentage points (columns 3 and 6). Recipients of large LSDs raised their rollovers by just 4-12 percentage points, and these effects are not significant among recipients older than 55. For older households, the difference in coefficients has p-values of .034 in the probit and

[24] Chang (1996) reports a 9.1 percentage point increase in the likelihood of a rollover as a difference-in-difference estimate of the effect of the 1986 reforms on recipients younger than 55 relative to those aged 55 or older.

[25]We calculate age-adjusted quintile of total household income using income data and age in the survey year closest to the job separation in question.

.019 in the OLS specification.

The fact that withholding had an effect is evidence against a purely rational model. The withholding rule had no impact on effective tax rates, but it made the tax consequences of rollover choices more salient *at the time a decision has to be made*. In a model of rational calculating individuals with foresight, these changes should have no effect. In a variety of alternative models, however, such changes could have significant effects – if people understand the withholding tax to represent a suggestion by government that rolling the funds over would be a good idea, if people do not have foresight, etc.

The fact that the withholding rules had effects mainly on small LSDs suggests that interactions among policies could be quite important. Recall that in the years before and after 1993, firms could cash out small balances if there was no directive from the departing employee. The withholding rule may have made employees pay attention to the rollover decision at the time it had to be made and then choose to keep the funds in a tax-preferred account, thus not giving firms the chance to make unilateral choices.

Finally, the fact that tax withholding created the largest differences between large and small LSDs among households who were older than 55 is further evidence of the non-rationality of the response. These households would be most likely not to bear any penalty for cashing in the funds.[26]

VI. Conclusion

Policy makers have expressed significant concerns about pre-retirement cash-outs

[26] Duflo et al. (2006) and Choi et al. (2005) provide further evidence of irrational behavior related to retirement saving among individuals 59 and older.

of retirement account balances. Our evidence shows that effective tax rates affect individuals' decisions to rollover or cash out their balances. The link between tax rates and rollovers is not surprising, and is consistent with both rational and behavioral considerations.

Several additional results help clarify the channels through which public policies influence rollover behavior, and, in general, point to the importance of behavioral considerations. First, specifying some of the effective tax rate as a "penalty" (as was done in 1986) rather than as an "ordinary" tax rate has a significant impact on behavior. Indeed, controlling for both the existence of a penalty, and the overall effective tax rate (including the penalty), the existence of a penalty dominates the results. Second, the 1992 changes – which required employers to offer a rollover option and imposed withholding taxes on funds that were not rolled over but did not affect the ultimate tax burden on rollovers versus cash-outs – led to substantial increases in rollover propensities. Third, the 1986 changes – which altered the effective rate of taxation – were associated with little change in rollovers of small LSDs, but substantial increases in rollovers of large LSDs. In contrast, the 1993 changes – which did not alter the effective tax rate, but which may have made the rollover choice easier and more attractive for workers – were associated with substantial increases in rollovers of small LSDs that were as large as, or larger than, the increase in rollovers of large LSDs. This pattern may have occurred because the tax withholding rules make the tax consequences of the rollover decision salient to the worker at the time the decision needs to be made, whereas changes in effective tax rates do not necessarily come to the worker's attention until the tax return has to be filed.

The results have implications for the relative importance of, and interactions between, economic incentives and psychological factors in household saving behavior. They offer policy makers new and potentially powerful dimensions along which to alter public policy. The results also suggest that when public policies aim to influence behavior through a variety of interventions, the interactions among the interventions can play a first-order role. Finally, the results imply that the content of a public policy can and should be considered to be broader than just how it affects individuals' budget constraints.

Appendix

This Appendix derives the maximum likelihood representation of a model of LSD choices that allows for partial rollovers. Let

(A-1) $1 + r(L) = \dfrac{1 + r(0)}{(L+1)^{\alpha}}$, where $\alpha \geq 0$.

In the special case where α=0, *r*(L) = r(0) and the probit model holds.

The likelihood function may be written as

$$\text{(A-2)} \quad \prod_{\substack{roll \\ all}} \Phi\left(\tilde{Z}\tilde{\beta}\right) \times \prod_{\substack{roll \\ some}} \left[\Phi\left(\tilde{Z}\tilde{\beta} + \frac{\alpha}{\sigma} \ln(1+L) \right) - \Phi\left(\tilde{Z}\tilde{\beta}\right) \right] \times \prod_{\substack{roll \\ none}} \left[1 - \Phi\left(\tilde{Z}\tilde{\beta} + \frac{\alpha}{\sigma} \ln(1+L) \right) \right],$$

where each of the products, Π, refers to the product of the likelihoods for each type of observation, and $\tilde{Z} \equiv \left\{ \frac{1}{N} \ln\left(\frac{1-\tau_N}{1-\tau_0-\pi} \right), Z \right\}$, and $\tilde{\beta} \equiv \left(\frac{1}{\sigma}, \frac{-\beta}{\sigma} \right)$. Maximization of (A-2) will produce consistent estimates of 1/σ, -β/σ, and α/σ. Note that, if *L* were a constant, (A-2) would be the likelihood underlying an ordered probit. The variant where *L* is different for each taxpayer may be estimated by general maximization techniques.

References

Andrews, Emily. 1991. "Retirement Savings and Lump-Sum Distributions." *Benefits Quarterly*, 2: 47-58.

Benjamin, Daniel J. 2003. "Does 401(k) Eligibility Increase National Savings?: Evidence from Propensity Score Subclassification." *Journal of Public Economics*, 87(5-6): 1259-1290.

Bertrand, Marianne, Dean Karlan, Sendhil Mullainathan, Eldar Shafir, and Jonathan Zinman. 2005. "What's Psychology Worth? A Field Experiment in the Consumer Credit Market." NBER Working Paper 11892.

Burman, Leonard E., Norma B. Coe, and William G. Gale. 1999. "Lump Sum Distributions from Pension Plans: Recent Evidence and Issues for Policy and Research." *National Tax Journal*, 52(3): 553-562.

Chang, Angela. 1996. "Tax Policy, Lump-Sum Pension Distributions, and Household Saving." *National Tax Journal*, 49(2): 235-252.

Choi, James J., David Laibson, and Brigitte C. Madrian, 2005. "$100 Bills on the Sidewalk: Suboptimal Saving in 401(k) Plans." NBER Working Paper 11554.

Duflo, Esther and Emmanuel Saez. 2003. "The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment." *Quarterly Journal of Economics*, 118(3): 815-842.

Duflo, Esther, William Gale, Jeffrey Liebman, Peter Orszag, and Emmanuel Saez. 2006. "Saving Incentives for Low- and Middle-Income Families: Evidence from a Field Experiment with H&R Block." *Quarterly Journal of Economics*, 121(4): 1311-1346.

Engelhardt, Gary V. 2001. "Pre-retirement Lump Sum Distributions and Retirement Income Security: Evidence from the Health and Retirement Survey." Syracuse University Working Paper 2002-022.

Engelhardt, Gary V. and Anil Kumar. 2007. "Pensions and Household Wealth Accumulation." http://www-cpr.maxwell.syr.edu/faculty/engelhardt/pensions-household-wealth.pdf.

Engen, Eric M., William G. Gale, and John Karl Scholz. 1996. "The Illusory Effects of Saving Incentives on Saving." *Journal of Economic Perspectives*, 10(4): 113-138.

Engen, Eric M., William G. Gale, and Cori E. Uccello. 1999. "The Adequacy of Household Saving." *Brookings Papers on Economic Activity*, 0(2): 65-165.

Fernandez, Phyllis. 1992. "Pre-retirement Lump-Sum Distributions." In *Trends in Pensions*, ed. John Turner and Daniel Beller. Washington DC: US Department of Labor.

Gustman, Alan, and Thomas Steinmeier. 1998. "Effects of Pensions on Saving: Analysis with Data from the Health and Retirement Survey." NBER Working Paper 6081.

Hurd, Michael, Lee Lillard, and Constantijn Panis. 1998. "An Analysis of the Choice to Cash Out Pension Rights at Job Change or Retirement." http://www.rand.org/health/centers/archive/dol/papers/DRU-1979-DOL.pdf

Hurd, Michael, and Constantijn Panis. 2002. "An Analysis of the Choice to Cash Out Pension Rights at Job Change or Retirement." RAND Institute. Mimeo. (September).

Hurst, Erik. 2003. "Grasshoppers, Ants, and Pre-Retirement Wealth: A Test of Permanent Income." NBER Working Paper 10098.

Korczyk, Sophie M. 1996. "Pre-Retirement Pension Distributions in the Health and Retirement Study." The Public Policy Report 9609, American Association of Retired Persons.

Madrian, Brigitte C. and Dennis F. Shea. 2001. "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior." *The Quarterly Journal of Economics*, 116(4): 1149-1187.

Munnell, Alicia H. and James G. Lee. 2004. "Changing 401(k) Defaults on Cashing Out: Another Step in the Right Direction." Center for Retirement Research. Boston College. September. Number 12.

Poterba, James M., Steven F. Venti, and David A. Wise. 1996. "How Retirement Saving Programs Increase Saving." *Journal of Economic Perspectives*, 10(4): 91-112.

Poterba, James M., Steven F. Venti, and David A. Wise. 1998. "Lump-Sum Distributions from Retirement Saving Plans: Receipt and Utilization." In *Inquiries in the Economics of Aging*, ed. David A. Wise, 85-105. Chicago: University of Chicago Press.

Poterba, James M., Steven F. Venti, and David A. Wise. 1999. "Pre-Retirement Cashouts and Foregone Retirement Saving: Implications for 401(K) Asset Accumulation." NBER Working Paper W7314.

Sabelhaus, John, and David Weiner. 1999. "Disposition of Lump-Sum Pension Distributions: Evidence from Tax Returns." *National Tax Journal*, 52(3): 593-614.

Saez, Emmanuel. 2007. "Details Matter: The Impact of Presentation and Information on the Take-Up of Financial Incentives for Retirement Saving." CEPR Discussion Paper 6386.

Scott, Jason, and John Shoven. 1996. "Lump-sum Distributions: Fulfilling the Portability Promise or Eroding Retirement Security?" EBRI Issue Brief 178.

Scholz, John Karl, Ananth Seshadri, and Surachai Khitatrakun. 2006. "Are Americans Saving 'Optimally' For Retirement?" *Journal of Political Economy*, 114(4): 607-643.

Woods, John R. 1996. "Pension Benefits Among the Aged: Conflicting Measures, Unequal Distributions." *Social Security Bulletin*, 59 (3): 3-30.

Yakoboski, Paul. 1997. "Large Plan Lump-Sums: Rollovers and Cashouts." EBRI Issue Brief 188.

Figure 1
Change in Tax Rates and Rollover Behavior by Year and LSD Size
(LSD Recipients Aged 25-54)

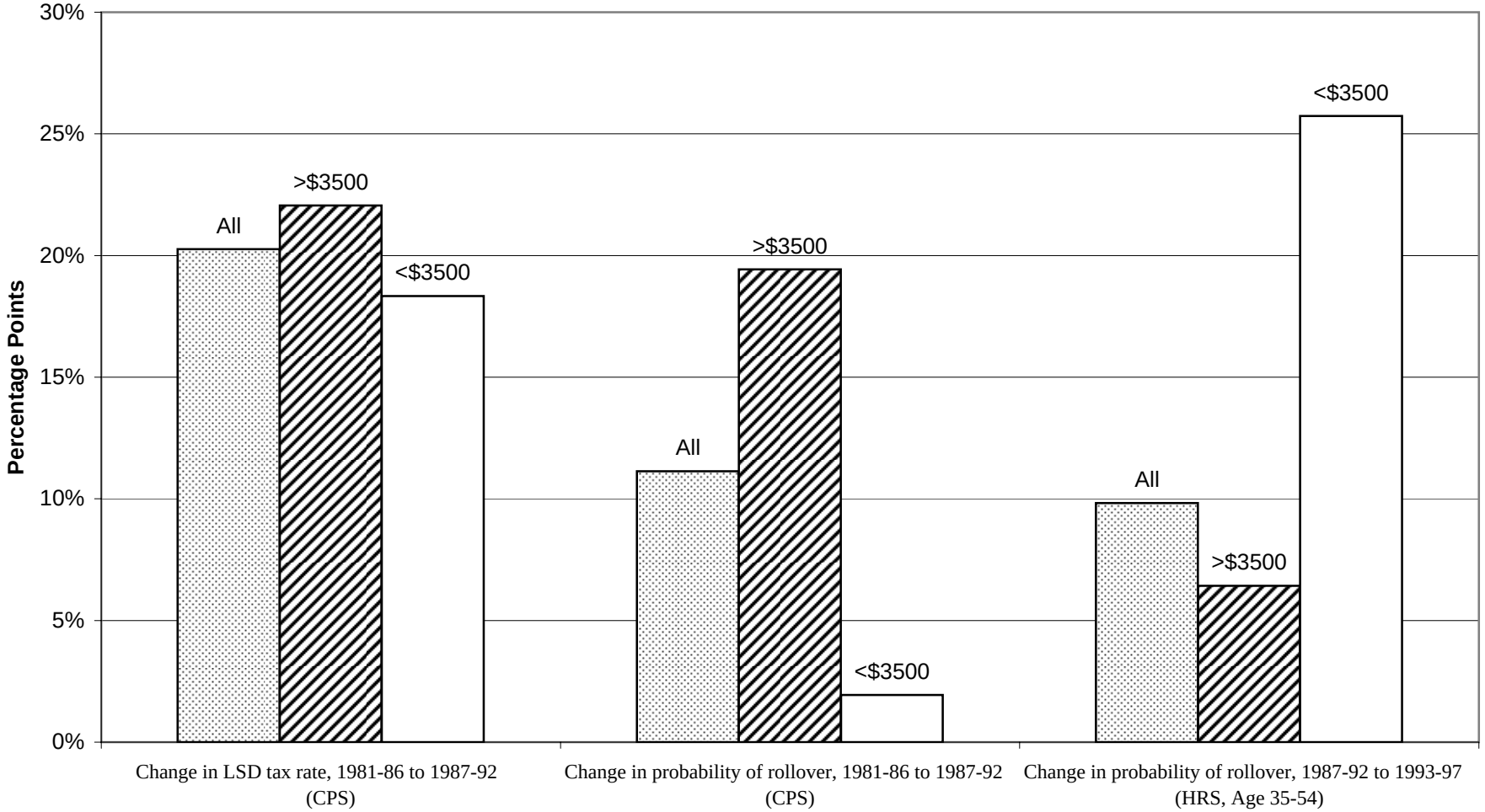

Table 1
Tax and Rollover Summary Statistics 1981-92
(Current Population Survey)

LSD Size	All				>$3500				<$3500			
Age of Recipient	25-54		55-64		25-54		55-64		25-54		55-64	
Year of Receipt	1981-86	1987-92	1981-86	1987-92	1981-86	1987-92	1981-86	1987-92	1981-86	1987-92	1981-86	1987-92
r*[1]	8.0	8.6	8.0	8.2	8.0	8.7	8.0	8.2	8.0	8.5	--	--
LSD Tax Rate[1]	6.3	26.6	11.4	13.1	7.0	29.0	11.4	13.1	5.7	24.0	--	--
LSD Tax Rate - Retirement Tax Rate[1]	0.0	11.7	0.0	3.1	0.0	11.6	0.0	3.1	0.0	11.8	--	--
Probability of Rollover[1]	16.6	27.7	58.9	35.9	21.9	41.4	58.9	35.9	11.7	13.6	--	--
Observations	419	1121	14	60	189	554	14	60	230	567	--	--

Source: Authors tabulations using the 1993 Employee Benefit Supplement of the Current Population Survey.
All figures are obtained using CPS sampling weights.

1) In percentage points.

Table 2
Tax and Rollover Summary Statistics 1987-97
(Health and Retirement Study)

LSD Size	All				>$3500				<$3500			
Age of Recipient	35-54		55-64		35-54		55-64		35-54		55-64	
Year of Receipt	1987-92	1993-97	1987-92	1993-97	1987-92	1993-97	1987-92	1993-97	1987-92	1993-97	1987-92	1993-97
Probability of Rollover	57.4	70.0	62.9	74.0	66.4	75.3	71.1	76.5	29.4	55.2	33.2	64.0
Observations	324	276	162	421	230	194	128	333	94	82	34	88

Source: Authors tabulations using waves 1-7 of the HRS.
All figures are obtained using HRS sampling weights.

Table 3
Policy Effects on Rollover Behavior
(1981-92, Current Population Survey Data)

		Probit Marginal Effects			OLS Estimates		
		All	LSD>3500	LSD<3500	All	LSD>3500	LSD<3500
(1)	**r***	7.99	10.60	-8.93	9.26	12.98	-7.22
		(.026)	(.009)	(.328)	(.025)	(.008)	(.219)
			{.050}			{.008}	
(2)	**LSDtax**	0.70	0.91	-0.14	0.81	1.16	-0.11
		(.001)	(.000)	(.696)	(.000)	(.000)	(.678)
			{.017}			{.002}	
(3)	**LSDtax - Retirement Tax Rate**	0.31	1.16	-0.42	0.28	1.32	-0.30
		(.365)	(.023)	(.432)	(.418)	(.028)	(.363)
			{.033}			{.018}	
(4)	**r***	1.50	0.84	---	3.06	0.81	---
		(.752)	(.863)	---	(.549)	(.871)	---
	Penalty Dummy	0.21	0.30	---	0.26	0.32	---
		(.047)	(.039)	---	(.069)	(.028)	---
(5)	**LSDtax**	0.56	0.74	---	0.68	0.983	---
		(.009)	(.009)	---	(.002)	(.002)	---
	Penalty Dummy	0.16	0.18	---	0.20	0.166	---
		(.067)	(0.110)	---	(.081)	(0.170)	---
(6)	**LSDtax - Retirement Tax Rate**	-0.22	0.336	---	-0.18	0.42	---
		(.574)	(.591)	---	(.589)	(.556)	---
	Penalty Dummy	0.24	0.285	---	0.33	0.28	---
		(.004)	(.034)	---	(.005)	(.046)	---

Notes:

Marginal effect coefficients represent dF/dx, the marginal effect on the probability of rolling over. For dummy variables, the estimates show the effect of switching from 0 to 1. All marginal effect estimates calculated at the mean of the independent variables. P-values for individual coefficients are reported in parentheses. P-values associated with the difference between samples (i.e. LSD greater than $3,500 versus LSD less than $3,500) are reported in brackets.

Sampling weights from the April CPS are used.

Rollover in the CPS is defined as rollover to an IRA or the purchase of an annuity, which are tax-preferred relative to other uses reported in the data.

Table 4
Rollover Behavior by Year, Age, and LSD Size

Sample	Probit Marginal Effects			OLS Estimates		
	All	LSD>3500	LSD<3500	All	LSD>3500	LSD<3500
CPS Received 1981-1992						
(1) **(Age 25 - 54)*(Year 1987 - 92)**	0.126	0.206	0.048	0.116	0.197	0.027
	(.000)	(.000)	(.202)	(.000)	(.000)	(.321)
		{0.01}			{.000}	
(Age 55- 64)*(Year 1987 - 92)	-0.098	-0.099	---	-0.167	-0.163	---
	(.33)	(.319)	---	(.257)	(.258)	---
HRS Received 1987-1997						
(2) **(Age35 - 54)*(Year 1993 - 97)**	0.124	0.115	0.231	0.127	0.115	0.227
	(.004)	(.022)	(.002)	(.002)	(.015)	(.001)
		{0.118}			{0.117}	
(Age 55- 64)*(Year 1993 - 97)	0.103	0.043	0.268	0.103	0.043	0.302
	(.028)	(.397)	(.003)	(.026)	(.389)	(.002)
		{0.034}			{0.019}	

Notes:
Marginal effect coefficients represent dF/dx, the marginal effect on the probability of rolling over. For dummy variables, the estimates show the effect of switching from 0 to 1. All marginal effect estimates calculated at the mean of the independent variables. P-values for individual coefficients are reported in parentheses. P-values associated with the difference between samples (i.e. LSD greater than $3,500 versus LSD less than $3,500) are reported in brackets.

Sampling weights from the April CPS are used.

Rollover in the CPS is defined as rollover to an IRA or the purchase of an annuity, which are tax-preferred relative to other uses reported in the data.

Appendix Table 1: Covariate Summary Statistics for the CPS and HRS Samples

Sample	**CPS**			**HRS**		
Balance	**Any**	**$3,500 or Below**	**Over $3,500**	**Any**	**$3,500 or Below**	**Over $3,500**
Total Income *	$24,606 ($24,851)	$18,727 ($15,147)	$29,917 ($30,149)	$72,885 ($78,198)	$50,665 ($46,677)	$79,729 ($84,451)
Age at LSD	36.8 (8.9)	33.9 (7.0)	39.4 (9.5)	51.5 (7.3)	50.9 (6.8)	51.7 (7.4)
Age at survey	41.4 (9.1)	38.6 (7.4)	44.0 (9.7)	54.8 (4.9)	54.1 (5.3)	55.0 (4.8)
Nonwhite - percentage of total	8.8% (.284)	9.9% (.299)	7.9% (.270)	12.6% (.332)	12.6% (.332)	12.5% (.332)
Educational attainment **Percentage of total with highest degree of:**						
Less than high school	4.2%	4.2%	4.2%	11.2%	15.3%	9.9%
High school degree	28.9%	28.9%	22.3%	35.7%	48.9%	31.7%
Some college	22.0%	22.0%	21.6%	23.8%	21.5%	24.5%
College degree	35.1%	35.1%	36.6%	21.4%	12.5%	24.2%
Post-college degree	9.8%	9.8%	15.3%	7.9%	1.8%	9.7%
Observations	1614	797	817	1183	885	298

Standard deviations in parentheses

CPS and HRS sampling weights are used. Sample sizes here may be smaller than those reported in Table 1 because some obvservations are missing data on these control variables.

* Current dollars. We use income as reported at the time of the survey. That is, CPS income is for 1992, while HRS income is reported for the year of the survey in which the LSD is reported (ranging from 1991 to 2003). To some extent, then, higher incomes in the HRS reflect inflation. Also, the CPS sample uses family income, while the HRS sample uses household income.

Appendix Table 2
Distribution of LSD Amounts: CPS & HRS[a]

	CPS	HRS w/ top code
Percent of sample who 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

a. CPS sample is restricted to respondents who are in the same age cohort as the HRS respondents. The HRS data are tabulated to match CPS top-codes.
*Dollar Amounts in 1992 Dollars