Comments on Beshears, Choi, Hurwitz, Laibson, and Madrian,
LIQUIDITY IN RETIREMENT SAVINGS SYSTEMS: AN INTERNATIONAL COMPARISON

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Defined contribution (DC) tax-qualified savings plans became broadly available in the United States after the Revenue Act of 1978, in which Section 401(K) estabished that firms offering these plans had to make them available equitably to all employees. Justifications for DC plans such as 401(K)'s, and for Individual Retirement Accounts (IRA's), were that they would increase overall savings, and encourage retirements savings to supplement social security and keep middle-class retirees out of poverty. A question then, and now, is whether these plans do in fact incease total savings, or just divert savings into tax-qualified channels. The same question, writ smaller, can be asked about taxable early withdrawals from DC plans. First, does making DC plans more liquid induce higher withdrawals? If so, where do these withdrawals go? To a tax-qualified rollover Individual Retirement Account (IRA)? To non-tax-qualified investments that achieve better or more diversified returns? To essential consumption in emergencies? To discretionary consumption such as vacations, cars, and boats? Second, does increased liquidity induce higher contribution rates, offsetting increased withdrawals, or does it instead reduce incentives for after-tax precautionary savings? Overall, does making tax-qualified plans more liquid increase consumers' lifetime welfare, or just pander to present-bias that is in the end harmful?

Table 1. U.S. Retirement Assets

Trillions of dollars; year-end

	Other plans	DC plans	IRAs	DC+IRA	Total	Tax-Qualified Pct. of Total
1995	4.0	1.7	1.3	3.0	7.0	42.9%
2000	6.1	2.9	2.6	5.5	11.6	47.4%
2005	7.6	3.6	3.4	7.0	14.6	47.9%
2010	8.6	4.5	5.0	9.6	18.2	52.6%
2013	10.6	5.9	5.6[e]	11.5	23.0	49.8%

Source: Investment Company Institute Fact Book, 2014. ***Other plans*** *include private-sector DB plans; federal, state, and local pension plans; and all fixed and variable annuity reserves at life insurance companies less annuities held by IRAs, 403(b) plans, 457 plans, and private pension funds. Federal pension plans include U.S. Treasury security holdings of the civil service retirement and disability fund, the military retirement fund, the judicial retirement funds, the Railroad Retirement Board, and the foreign service retirement and disability fund, Federal Employees Retirement System Thrift Savings Plan.* ***DC plans*** *include 401(k) plans, 403(b) plans, 457 plans, Keoghs, and other DC plans without 401(k) features. I****RAs*** *include traditional IRAs, Roth IRAs, and employer-sponsored IRAs (SEP IRAs, SAR-SEP IRAs, and SIMPLE IRAs). Estimates are denoted by "e".*

Table 1 shows that tax-qualified Defined Contribution (DC) and IRA savings plans are major components of retirement savings of individuals in the United States. Individuals age 59½ and older are eligible to take taxable distributions from their tax-qualified assets without penalty, but below this age are *pre-eligible*, subject to a 10 percent early withdrawal penalty (paid to the IRS) unless the distribution qualifies as meeting IRS plus employer-specified hardship conditions. Argento, Bryant, and Sabelhaus (2013) use IRS data to estimate early withdrawals, penalized and not penalized, in 2010, with the results shown in Table 2. Collecting their results, gross contributions to tax-qualified savings plans by pre-eligible individuals were about 6.6 percent of their tax-qualified plan balances, but taxable distributions were 2.9 percent of these balances, leading to a net contribution rate of about 3.7 percent. Thus, there is considerable leakage from the DC retirement accounts of pre-eligible individuals. The immediate policy questions are whether the high leakage rates in the U.S. system lower net retirement savings substantially, and if so whether this harms U.S. consumers and the public welfare system (e.g., Medicaid) that acts as a insurer of last resort to retirees if they exhaust their resources.

Table 2. Distributions from Retirement Accounts, 2010

	All Returns		Age < 55		Age 55+	
Distributions from DC and IRA Retirement Accounts, 2010	Millions of returns	Billions of dollars	Millions of returns	Billions of dollars	Millions of returns	Billions of dollars
DC and IRA Account balances		$9,600.0		$3,596.6[e]		$6,003.0
Gross contributions		---		$238.4[e]		---
Gross distributions	38.5	$1,281.2	12.4	$241.0	26.1	$1,040.0
Non-taxable distributions	18.0	466.7	6.4	134.3	11.6	332.4
Direct rollovers	4.0	292.4	2.3	92.5	1.7	199.8
Indirect rollovers	0.5	37.5	0.3	10.9	0.2	26.6
Other non-taxable	10.9	110.5	1.9	20.2	9.0	90.2
Taxable distributions	32.5	804.4	8.1	104.3	24.4	700.0
Non-penalized	29.3	746.6	5.2	57.1	24.1	689.6
Penalized	5.7	57.7	4.9	47.3	0.8	10.5
Taxable as % of balances		8.4%		2.9%[e]		11.7%
Taxable as % of gross distributions	*84.4%*	*62.8%*	*65.3%*	*43.3%*	*93.5%*	*67.3%*
Penalized as % of taxable	*17.5%*	*7.2%*	*60.5%*	*45.3%*	*3.3%*	*1.5%*
Contributions as % of balances		---		6.6%[e]		---

Source: Argento,. Bryant, Sabelhaus (2013). Approximations derived from their statistics are denoted by "e".

In their paper, Beshears, Choi, Hurwitz, Laibson, and Madrian (hereafter BCHLM) carefully measure effective marginal tax rates on early withdrawals from tax-qualified defined contribution (DC) savings plans (like 401(K)'s) in six developed countries. For this comparison, the authors define a *marginal rate of transformation*

$$\text{MRT} = \frac{\text{net increase in consumption from pre-eligible withdrawal of US\$1from a DC plan}}{\text{net increase in consumption from eligible withdrawal of US\$1 from a DC plan}}$$

$$= \frac{1 - (\text{pre\_eligible marginal tax rate at current income including early withdrawal penalty})}{[1 - (\text{age\_eligible marginal tax rate at permanent income})] \cdot [\text{interest factor}]}$$

$$= \frac{1-[0.1+0.15]}{1-0.15} \text{ in the U.S. for non-hardship pre-eligible withdrawal, \$US60K permanent income}$$

BCHLM calculate these MRT's for a non-hardship withdrawal from a tax-qualified plan by a consumer with a permanent income of US$60K and an interest factor of one; Table 3 gives their results, along with parallel results for an individual with a permanent income of US$30K. They conclude that tax-qualified savings are far more liquid in the United States than in comparable developed countries.

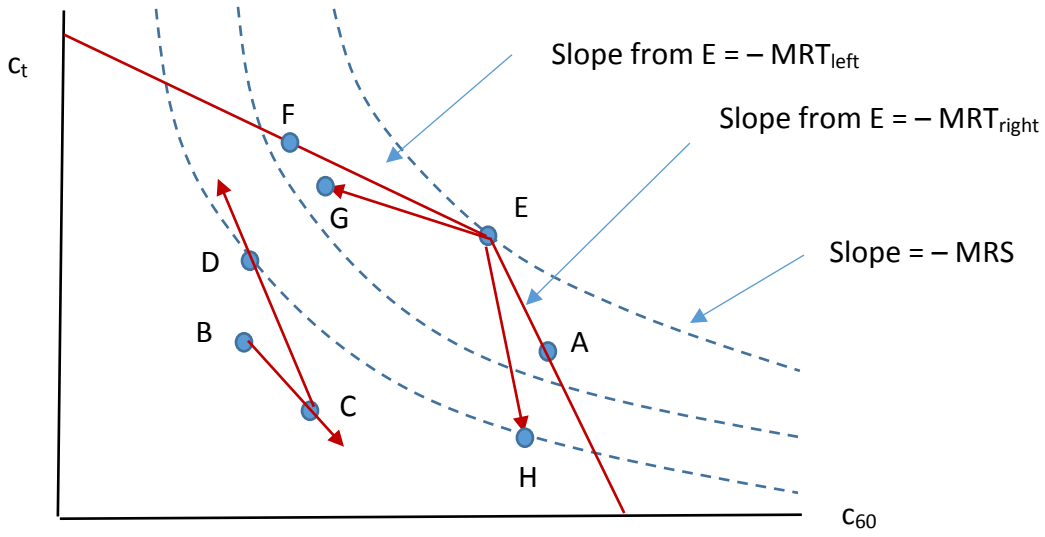
Table 3. MRT for Non-Hardship Withdrawals

Country	MRT at US$60K	MRT at US$30K
Australia	0	0
Canada	0	1.11
Germany	0	0
Singapore	0	0
United Kingdom	0	0
United States	0.88	0.88

To motivate the BCHLM focus on their MRT, and clarify its definition and application, consider the transactions through available channels that an individual can use to move resources between a pre-eligible age t and an age, say 60, when this person is eligible for withdrawals without penalty from tax-qualified accounts. These transactions can include additions to or withdrawals from tax-qualified and ordinary savings plans, and adjustments to direct investments in health and human capital (through education and health maintenance) and in physical capital (through housing maintenance, business investment and reinvestment, and real estate). In addition to shifting consumption between ages t and 60, transactions may be combined to improve the rate of return between these ages, for example by diverting funds from ordinary savings into education that increases future income. Legal, contractual, and tax rules constrain the transactions, determining their liquidity. Each possible transaction can be

characterized by its after-tax rate of transformation (MRT) between resources available at t and at 60. From the status quo at age t, there will be a minimum MRT_{right} among the available transactions that shift consumption forward to age 60, and a maximum MRT_{left} among those that shift consumption backward to age t. The familiar Fisher diagram in Figure 1 shows possible points A to H where the consumer may be located. From status quo point E, the transactions feasible *ex post* define a frontier (and associated MRT) extending through points F and A. There are additional points and transactions that are not efficient, such as the transactions from E to G or to H. Another is point B that is dominated by the point D reached by the feasible transaction from B to C followed by the feasible transaction from C to D. The figure also shows the consumer's indifference curves between consumption at ages t and 60, with slopes characterized by marginal rates of substitution $MRS \equiv m_t/m_{60} \cdot \rho_{t,60}$, where m_t and m_{60} denote the marginal utilities of consumption at these respective ages, and $\rho_{t,60}$ denotes the rate of impatience between these ages (including or excluding the influence of present-bias).

Figure 1. Intertemporal Transactions



Placed at the point E, the consumer will stay due to the stability condition $MRT_{left} \leq MRS \leq MRT_{right}$. Conversely, placed at the point A, the consumer has MRT > MRS if a move toward E is feasible, and will choose this transaction. The BCHLM MRT for withdrawals from tax-qualified savings is operative when the consumer is at a point like A, prefers to move consumption toward age t, and there is no other available transaction in this direction that has a larger MRT. The figure illustrates that it is important to consider the full set of transactions available to the consumer, *ex ante* at the times life planning decisions are made, and *ex post* after realization of life events, and important to distinguish between transactions that move the consumer along the *ex post* intertemporal frontier from transactions inside

the frontier that increase or reduce efficiency. Liquidity determines the availability of ex post transactions, and is a consideration in *ex ante* planning where there are trade-offs between liquidity and expected return, not only for savings channels, but also for direct investments such as education, businesses, and real estate.

Risk is important in assessing the benefits and costs of liquidity; without risk, transactions costs are the only barrier to holding assets in illiquid form. Risks arise on both the utility and technology sides of intertemporal transactions. The marginal utility of future consumption is uncertain because survival and future needs are uncertain, and the marginal utility of current consumption can be influenced by factors imperfectly observed by an employer or policy-maker such as meeting emergency needs of children or parents, or moving expenses associated with job changes for an individual or other family members. On the production side, future wage and salary income, payouts from defined benefit plans such as social security, and rates of return on tax-qualified and ordinary savings and on direct investments, are all uncertain. Then the individual faces a portfolio problem of allocating assets across savings and direct investment channels as well as the intertemporal allocation problem of setting savings targets to balance consumption at ages t and 60. The focus on expected returns in the BCHLM definition of MRT obscures the role of risk and its impact on retirement savings portfolio management. Some risk effects could be modelled within their framework by assuming temporally separable CARA utility functions and risks that have a multivariate normal distribution across transaction channels. This leads to expected utilities of certainty-equivalent expected returns that depend on the degree of risk aversion, overall market risk, and "market β's", and permit a CAPM analysis of the consumer's portfolio decisions. However, liquidity constraints, bankruptcy risk, and providers of last resort make the consumer's problem more complex than the usual CAPM setup.

The MRT defined by BCHLM is for non-hardship withdrawals where pre-eligible withdrawal penalties apply. In the U.S., hardship withdrawals are also important. Table 2 shows that in 2010, hardship withdrawals were 54.7 percent of all pre-eligible taxable withdrawals. Hardship withdrawals are allowed to varying degrees in every country; Table 4 gives an overview of the authors' findings. Analysis of the effects of hardship exemptions, particularly with varying categories across countries, would seem to require modelling (stochastic) needs and consumption in each category, with category-specific MRTs, rather than a blended MRT for the average mix of penalized and hardship pre-eligible withdrawals. It may help that some hardship categories, such as education, new home purchase, and house emergency repairs, are investments rather than current consumption, so the impact of a

withdrawal is confined to an assessment of the expected returns, the risks of these investments relative to DC plan assets, and the benefits of diversification. A daunting but potentially very useful research effort would be to disaggregate consumption along the lines of the hardship categories allowed in the various countries, and draw conclusions on the effective liquidity and consumer welfare benefits offered by DC plans with different hardship categories.

Table 4. Categories of Allowed Pre-Eligible Hardship Withdrawals

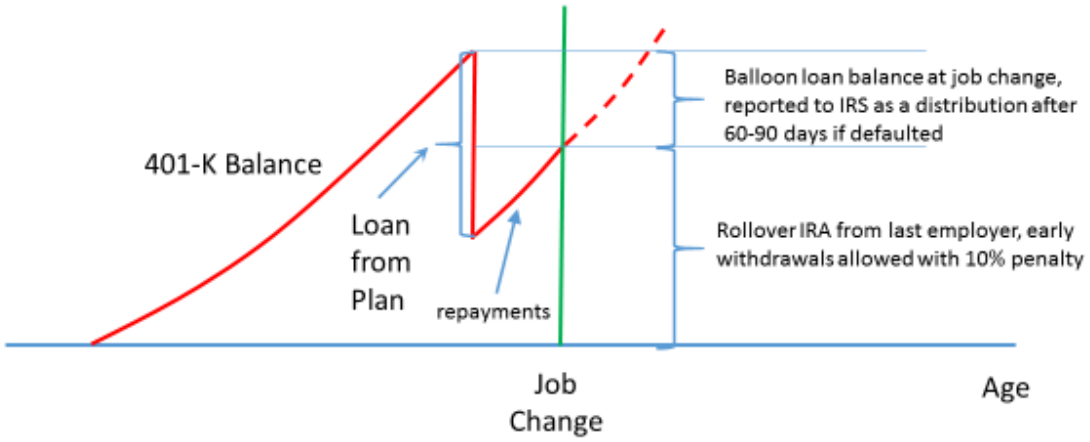
	Australia	Canada	Germany	Singa-pore	United Kingdom	United States
Health	Y	Y	Y	Y	Y	--
Permanent and total disability	--	--	--	--	--	Y
Medical expenses > 10% of AGI	--	--	--	--	--	Y
Terminal illness	Y	Y	Y	Y	Y	Y
Higher Education	N	--	--	Y	N	Y
Housing Investment	N	N	--	Y	N	Y
Unemployment	Y	N	N	N	N	N
Health Insurance premiums	--	--	--	--	--	Y
Income Loss	N	Y	N	N	N	N
IRS Tax levy	--	--	--	--	--	Y
Annuity	--	--	--	--	--	Y
Natural Disaster	--	--	--	--	--	Y
Domestic Dissolution	--	--	--	--	--	Y

A peculiarity of tax-qualified savings plans in the U.S. is that taxable withdrawals from 401(K)'s are substantially restricted by IRS and employer policies, but at the time of a job change, individuals can elect to roll over their 401(K) balances into IRA's that are essentially unrestricted. Figure 2 show the 401(K) balances of a typical individual over time, and can be used to identify points in lifetime savings plans where policy interventions are likely to be effective. The pictured individual has an accumulating balance in a 401(K) pan, and at a point in time takes a loan from his plan. This is allowed by many employers, subject to IRS rules. Lu, Mitchell, Utkus, and Young (2015) study borrowing from DC plans using data on a sample of more than 900,000 participants in 882 plans over the period 2004-2009. They state that loans from 401(K)'s can vary from a lower limit (often US$1K) up to the minimum of half the 401(K) balance and US$50K. Some employers allow only one loan as a time; others allow multiple loans up to these limits. Loan repayment periods are set by tax rules, typically 5 years, with interest rates set by the employer, and are collected by deductions from the employee's after-tax salary. Lu et al. find that over a five-year period, about 40 percent of DC plan holders have taken a loan at some point from

their DC assets, and in any given month, about 20 percent have a loan outstanding. Thus, gross loan rates and balances are fairly high. However, individuals do not have an opportunity to default on loan repayments and trigger a taxable distribution as long as they remain on their job.[1] Consequently, *net* withdrawal rates will be near zero as long as loans cannot default. (There are second-order effects on expected retirement balances if interest rates on 401(K) loans are different than the rate of return on the assets remaining in the 401(K) account, or if 401(K) loan repayments reduce other after-tax saving.)

However, the event of a job termination (quit or separation, transiting to unemployment or to a new job) triggers several critical consequences. First, any outstanding loan balance is converted to a balloon balance that is immediately due. Any part of this balance not repaid in 60 days is reported to the IRS as a taxable distribution, subject to the U.S. early withdrawal penalty. (Of course, if the individual has a balloon loan balance upon retirement, and at that point they are age-eligible, then this is an eligible distribution, that is not penalized but is nevertheless a net reduction in tax-qualified assets available from that point in time on.) Second, upon a job change, an individual can elect to roll over their 401(K) plan balances into an IRA, or may be forced out of their 401(K) if their plan balance is below an employer-set threshold. After establishing a rollover IRA, they can take taxable distributions from this plan at will, subject to the 10 percent early withdrawal penalty if they are pre-eligible and do not meet IRS rules for a hardship withdrawal.

Figure 2. Withdrawal Paths from DC Plans



[1] There are "deemed distributions" from loan defaults associated with temporary layoffs, long-term disability, maternity leave, or other leaves of absence that are not connected to a job termination. LMUK estimate that 8 percent of total 401(K) loan defaults are of this type.

How important are these pre-eligibility leakages from DC savings? Because they are largely triggered by job changes, a first question is how often individuals change jobs, and have needs and opportunities associated with these changes. Table 5 gives the distribution of job durations in the most recent job, up to 2008, in the cohort of workers aged 18-44 in 1978. For most individuals, turnovers are frequent, and job durations are short, giving ample opportunities to withdraw DC assets.

Table 5. Distribution of Job Durations

Years in Job	<1	1-2	3-4	5-9	10-19	20+
Percent in 2008	22.9	13.0	16.9	20.2	16.8	10.3

Source: www.bls.gov/news.release/pdf/nlsoy.pdf

Thus, only about 26 percent of workers remain in one job long enough to substantially restrict their opportunities for early withdrawals from DC plans. For the same NLSY cohorts, Table 6 gives the distribution of numbers of jobs held between 1978 and 2008, broken down by educational attainment and gender. There is substantial "mover-stayer" heterogeneity, but the overall number of job changes is high in all the socioeconomic groups. The table also indicates that the share of available weeks employed is always less than 90 percent. This reflects both unemployment and time out of the labor force, but is an indication that financial shocks due to not working are an important feature of lifetime income profiles. Since such shocks are strongly correlated with job terminations, there will be for many individuals a "perfect storm" in which balloon balances on 401(K) loans and the withdrawal opportunities from rollover IRA accounts coincide with negative income shocks that trigger income replacement needs.

Table 6. Number of Jobs over 30 Years

	0 or 1 job	2 to 4 jobs	5 to 7 jobs	8 to 10 jobs	11 to 14 jobs	15 or more jobs	Number of jobs held	Percent of weeks employed
Men	0.8%	10.0%	18.4%	20.7%	21.8%	28.4%	11.6	84.0%
Less than HS graduate	0.7%	7.4%	11.6%	16.0%	26.1%	38.2%	13.3	70.7%
High school graduate	1.0%	12.6%	21.0%	20.4%	18.4%	26.6%	11	83.4%
Some college	0.6%	10.4%	20.6%	17.3%	18.1%	33.1%	12	86.3%
Bachelor's degree up	0.6%	7.2%	16.8%	25.8%	27.1%	22.6%	11.2	87.9%
Women	1.4%	10.2%	20.2%	21.0%	23.2%	24.1%	11	71.2%
Less than HS graduate	5.8%	13.5%	19.6%	18.2%	23.1%	19.7%	9.9	45.8%
High school graduate	1.0%	13.8%	25.5%	20.1%	19.8%	19.8%	10.1	68.8%

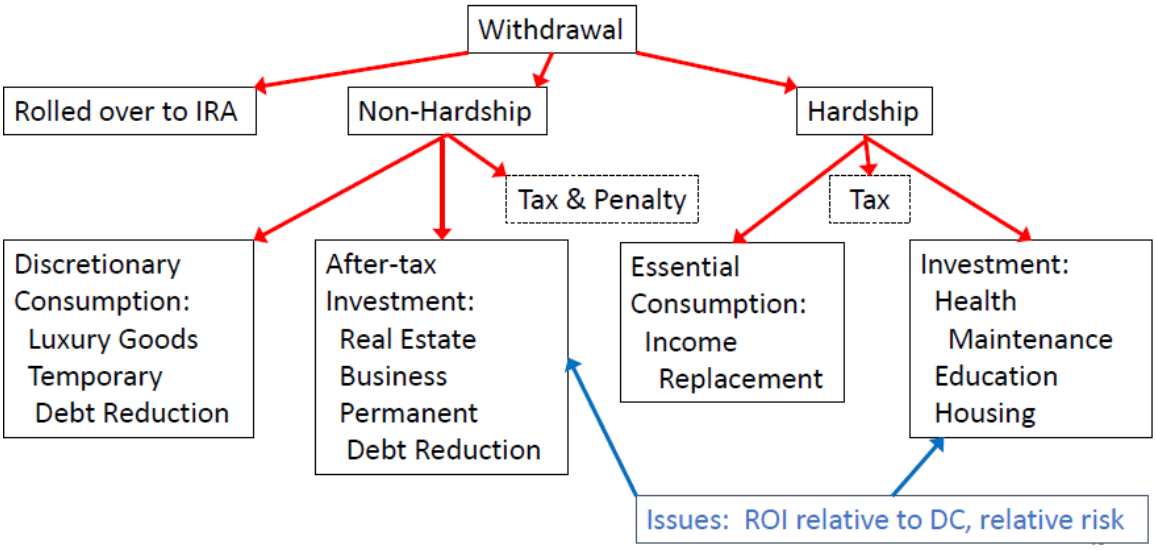
Some college	0.6%	9.3%	18.3%	20.7%	26.5%	24.6%	11.4	73.5%
Bachelor's degree up	0.8%	5.2%	15.4%	23.4%	24.7%	30.5%	12.2	79.7%

Source: www.bls.gov/news.release/pdf/nlsoy.pdf

Argento, Bryant, and Sabelhaus found US$104.3 billion in pre-eligible taxable withdrawals in 2010, of which about US$6 billion is estimated by LMUY to arise from unrepaid 401(K) balloon loan balances incurred at the time of a job change.

The disposition of pre-eligible gross withdrawals from tax-qualified savings plans is pictured in Figure 3. These can be rolled over directly or indirectly to IRA or similar tax-qualified accounts, or can be taken as taxable non-hardship withdrawals with penalty and directed to discretionary consumption or after-tax investments such as business and real estate, or when they qualify can be taken as hardship withdrawals that either go to qualifying consumption categories such as mortgage assistance when unemployed or into investment categories such as education or home repair/remodeling.

Figure 3. Disposition of Pre-Eligible Gross Withdrawals from Tax-Qualified Plans



Clearly, if net withdrawals go to current consumption, overall retirement savings fall. Discretionary consumption may be influenced by present-bias, but essential consumption may be desirable for the consumer even if there is no present-bias. The impact of investments in health capital, education, or housing, all of which will qualify as hardship withdrawals under some circumstances, or investment in real estate, a business, or in permanent reduction in after-tax debt (e.g., credit card debt), have more

complex consequences, depending on the comparative expected ROI inside and outside the tax-qualified account, and the relative risks of investments inside and outside DC plans.

The distribution of IRA withdrawals from non-retirees in 2013 is given in Table 7, with categories that correspond roughly to Figure 3. About 31 percent of gross distributions go to discretionary consumption; the remainder may be justified as meeting essential short-term needs or as financing productive alternative investments.

Table 7. IRA Withdrawals of Non-Retirees

Use of IRA withdrawal	Percent
Living Expenses	19
Car, Boat, other Big Ticket Item (except housing)	12
Emergency	17
Home purchase, remodel, repair	19
Health	9
Education	7
Rolled over to another retirement account	24
Not Specified/Other	8

Source: Investment Company Fact Book 2014, Table 7.23

In conclusion, we can look forward to answers in the future from BCHLM, informed by international comparisons, and perhaps data on comprehensive household accounts and dynamic portfolio rebalancing, savings, and dissaving, on whether liquidity in DC plans induces more contributions, what happens to withdrawals from DC plans, and to what extent a benevolently paternalistic planner would conclude that liberal withdrawal policies promote lifetime welfare rather than just undoing the protection against present-bias that these plans were in part designed to suppress.

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