RETIREMENT SAVING AND SUBSEQUENT ASSET LIQUIDATION: USING BEHAVIORAL FINANCE TO EXPLAIN IRRATIONAL DECISIONS

Diane K. Schooley, Boise State University, Boise, ID 83725, 208-426-4047, dschoole@boisestate.edu
Debra Drecnik Worden, George Fox University, Newberg, OR 97132-2697, 503-554-2816, dworden@georgefox.edu

ABSTRACT

With recent proposals for cuts to social security benefits, individuals can no longer ignore the need to save for retirement. By examining factors that influence retirement savings, this study finds that controlling for age and income, education increases the likelihood that a household member has a pension or IRA/Keogh plan. Home ownership and having a savings rule also increase the likelihood.

INTRODUCTION AND LITERATURE REVIEW

Understanding motivation to save is paramount in helping households make decisions that will provide them funding for the best retirement possible. The life-cycle model assumes that rational individuals are dissavers in their younger years, borrowing to meet consumption needs. As they enter later stages of their life cycles, they eventually spend less that they make, becoming savers. Finally, when they retire, they convert their savings to consumption at a rate that will exhaust savings at death. The underlying assumption is that people are well-informed and act rationally. They correctly estimate probabilities of future payoffs, and use constant discount rates to maximize the utility of consumption over their lifetimes.

That fact that households have saved little for retirement is difficult to explain using standard economic models. Behavioral finance provides insights into why behavior may deviate from that of the rational economic agents forming the basis of economic theory. The notions of bounded rationality [3] and bounded self-control [4] provide that consumers do not want to trade consumption today for consumption in the future. Though understanding the consequences of not saving, they find it difficult to control consumption today. They have good intentions, but lack the self-control to carry them out.

Another explanation for lack of saving provided by behavioral finance involves discount rates. Rational individuals utilize constant discount rates over time, but some individuals are hyperbolic discounters [1]. That is, they apply higher discount rates to the near term than to the future. They place a lower value on future benefits and overvalue the present.

Individuals who realize these shortcomings may employ a heuristic to help them save. For example, they may use a savings rule, whereby they save a particular percentage of their income, or a set dollar amount each period. Others may use home ownership as a savings tool. Individuals who have been involved with some type of savings behavior, such as buying a home, may be more likely to save for other purposes such as retirement [5].

Framing is another tool through which individuals can be induced to save for retirement. Responses to questions often depend upon how a question is asked or information is provided. Individuals tend to adopt the default choice when faced with a complex decision. Consider the case of a retirement plan. When workers are required to opt-in to a retirement plan, the default decision is to not participate in the plan, while with automatic enrollment the default is to save at a pre-specified rate. Plan participation

rates at companies jumped from 37 percent to 86 percent for new hires after changing to an automatic enrollment plan [2].

DATA

All variables used in this study are derived from the 2007 Federal Reserve Board Survey of Consumer Finances (SCF)[1]. The purpose of the SCF is to provide a comprehensive view of the financial behavior of a cross-section of U.S. households. Detailed information is gathered on all assets and liabilities of the household, as well as demographic characteristics such as home ownership, age, employment, and income. Attitudes about the economy, saving and spending are also measured.

Descriptive statistics for the sample are provided in Table 1. Over half of the households in the sample (57 percent) have some type of pension plan or are receiving a pension benefit (Pension) while 43 percent have an IRA or Keogh type account (IRA/Keogh). About a quarter of the sample has earned a high school diploma, more than a quarter (27 percent) of the sample has earned a college degree and over 20 percent earned a graduate degree. The most common generation of household head is BabyBoomer, who comprise 42 percent of the sample. Generation X and Matures each comprise approximately a quarter of the sample, while only five percent of the sample household heads belong to Generation Y. Three quarters of the sample households owns a home. Forty-eight percent of the households report no regular savings plan or profess not to save at all (No Saving Rule). Examples include setting money aside each month or spending the income of one family member, while saving all other income.

In terms of attitude toward risk, only five percent of the households are willing to take substantial risk to earn substantial returns. Twenty one percent are willing to take above average risk. The most common attitude toward risk, those willing to take average risk, comprise 42 percent while almost a third of the sample (31 percent) are not willing to take any risks. Fifty seven percent of the households feel that it is very important or important to leave an inheritance. The median age of the head of household is 51 years; median household income is $70,000.

MULTIVARIATE ANALYSIS

A logistic regression is used to estimate the probability that respondents will indicate they have a pension or IRA or Keogh. The model assumes that the respondent's choices are characterized by a logistic distribution, and the maximum likelihood estimates of the regression coefficients yield an estimated probability derived from the cumulative logistic distribution function.

The results are presented in Table 2 and are interpreted as follows. For the indicator variables, the odds ratio estimate denotes the marginal effect on the probability that the household will have a pension plan or IRA/Keogh plan when the variable is turned on, takes the value 1 relative to the value 0. For the continuous variables, the odds ratio estimate indicates the marginal impact on the probability that the household will have a pension plan or IRA/Keogh given a one year change in age or a $1,000 change in annual income.

[1] The data are available at www.federalreserve.gov/pubs/oss/oss2/2007/scf2007data.html

Table 1
Variable Definitions and Descriptive Statistics

Dependent Variables	Definition	Descriptive Statistics
Pension	Household has a pension plan; includes a defined benefit or defined contribution plan with a current job, currently receiving a pension benefit, expects to receive a pension benefit from previous jobs, has an IRA-SEP/Simple account for self-employed or small businesses; does not take into consideration whether the household has an extra IRA or Keogh type account. n = 4,418	Proportion of Sample: 0.571
IRA/Keogh	Household has an IRA or Keogh type account; includes Roth accounts, regular IRAs, a rolled-over account into an IRA from a previous job; excludes IRAs that are part of a retirement plan for a current job or IRA-SEP/Simple accounts for the self-employed or small businesses, i.e., this variable is attempting to capture those households who have "extra" retirement money set aside on top of current pension plans. n = 4,418	Proportion of Sample: 0.431

Explanatory Variables	Definition	Descriptive Statistics
Education Level	Highest level of education earned by household head	Proportion of Sample:
No HS Diploma	No high school diploma	0.099
HS Diploma	High school diploma or GED	0.258
Some College	Attended college, but a degree not earned	0.158
College Degree	Earned a college degree, excludes certificate from trade school	0.274
Graduate Degree	Earned a graduate degree (MA,MS,MBA,PhD,JD,MD,etc.)	0.211
Generation of Household Head		Proportion of Sample:
Gen Y	Household head born after 1980	0.053
Generation X	Household head born in 1964 through 1980	0.259
BabyBoomer	Household head born in 1945 through 1963	0.425
Matures	Household head born prior to 1945	0.263
Financial Discipline		Proportion of Sample:
No Saving Rule	Household has no consistent plan for saving income	0.484
Homeowner	Household owns home	0.742
Risk Aversion	Household attitude about the amount of financial risk they are	Proportion of Sample:

	willing to take when saving or making investments	
High Risk	Take substantial risks expecting to earn substantial returns	0.052
More Risk	Take above-avg risks expecting to earn above-avg returns	0.214
Avg Risk	Take average risks expecting to earn average returns	0.422
No Risk	Not willing to take any risks	0.312
Estate	Household feels it is very important or important to leave an estate or inheritance to their surviving heirs	Proportion of Sample: 0.567

Control Variables	Definition	Descriptive Statistics
Age	Age of household head	Mean = 52 yrs Median = 51 yrs
Income	Total gross income received by the household in 2006 from all sources, including withdrawals from IRAs and pension accounts; in $000s	Median value for all households: $70.00

The results indicate that age does not have a significant effect on the probability that a household will have a Pension, but shows a positive relationship between the age of the household head and the probability of an IRA/Keogh plan. The older the household head, the higher the probability that the household will have an IRA/Keogh plan. The odds ratio indicates that for each year older the head of household, the probability that the household has an IRA/Keogh plan increases by two percentage points.

The point estimate of the odds ratio for Income is 1.00 but significant, indicating that a change in income has very slight positive impact on the probability that the household will have a pension plan or IRA/Keogh. Thus, when other household characteristics are held constant, the level of income is not a driving factor in determining who will spend more when their assets increase in value.

The probability that the household has a pension or IRA/Keogh is significantly related to the level of education achieved by the head of household, even when other factors such as age and income are held constant. Compared to respondents with a college degree, those with a graduate degree, while no more likely to have a pension plan, are 77 percent more likely to have an IRA/Keogh plan. Those who have no high school diploma are 68 percent and 87 percent, respectively, less likely to have a pension or IRA/Keogh. One possible explanation is that those with graduate degrees may have professional occupations that provide for a pension plan. In addition, those with more education may better understand the importance of saving for retirement.

Homeowners are 116 percent more likely than renters to have a pension plan and 259 percent more likely to have an IRA/Keogh. Homeownership has a significant positive impact on the probability that a household will have a pension plan or IRA/Keogh. Households who do not have a consistent savings rule for household income are 40 percent less likely to have a pension plan and 43 percent less likely to

have an IRA/Keogh. Savings rules represent a form of self-control, a characteristic that may be lacking according to the behavioral life-cycle model. As expected, using a savings rule can help households to better save for retirement.

Table 2
Results of Logistic Regression on Pension and IRA/Keogh

	Odds Ratio Estimates (Pension)			Odds Ratio Estimates (IRA/Keogh)		
Explanatory variable	Point Estimate	95% Confidence Interval Estimate	p-value	Point Estimate	95% Confidence Interval Estimate	p-value
Intercept	1.11	0.87 – 1.42	0.402	0.19*	0.14 – 0.25	0.000
Age	1.00	1.00 – 1.00	0.215	1.02*	1.02 – 1.03	0.000
Income[1]	1.00*	1.00 – 1.00	0.000	1.00*	1.00 – 1.00	0.027
Education						
No Diploma	0.32*	0.25- 0.40	0.000	0.13*	0.09 – 0.18	0.000
High School	0.65*	0.55 – 0.77	0.000	0.28*	0.23 – 0.34	0.000
Some College	0.82*	0.67 – 0.99	0.045	0.47*	0.38 – 0.58	0.000
Grad Degree	1.17	0.97 – 1.41	0.111	1.77*	1.46 – 2.15	0.000
Homeowner	2.16*	1.85 – 2.53	0.000	3.59*	2.95 – 4.37	0.000
No Saving Rule	0.60*	0.53 – 0.68	0.000	0.57*	0.49 – 0.65	0.000

n = 4,418

* Odds Ratio Estimate differs from 1.00 at a 5 percent significance level.

[1] For Pension, the Income odds ratio estimate is 0.99996 with a confidence interval of 0.99995 – 0.99998, indicating a significant negative effect on the likelihood that a household has a pension plan.

For IRA/Keogh, the Income odds ratio estimate is 1.00002 with a confidence interval of 1.000002 – 1.00003, indicating a significant positive effect on the likelihood that a household has an IRA/Keogh account.

The p-value is the observed level of significance for the maximum likelihood estimates of the regression coefficients, β_k

In both equations, the chi-square statistics for the likelihood ratio tests in each of the 5 imputations are significant at less than the 1 percent level.

REFERENCES

[1] Laibson, David I., Andrea Repetto, and Jeremy Tobacman. 1998. Self Control and Saving for Retirement. *Brookings Papers on Economic Activity* I: 91-196.

[2] Mitchell, O. and Stephen Utkus. 2003. Lessons from Behavioral Finance for Retirement Plan Design. *Pension Design and Structure: New Lessons from Behavioral Finance*, 3 – 41. Mitchell, O. and Stephen Utkus, eds. Oxford University Press, 2003.

[3] Simon, Herbert. 1955. A Behavioral Model of Rational Choice. *The Quarterly Journal of Economics*, 69, 1: 99-118.

[4] Thaler, Richard and H.M. Shefrin. 1981. An Economic Theory of Self-Control. *Journal of Political Economy*, 89: 392-406.

[5] Warneryd, K. 1999. *The Psychology of Saving: A Study on Economic Psychology*, Cheltenham, UK, Edward Elgar Publishing.