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# Making Savings Last During Retirement: Lessons From Behavioral Economics

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### I. INTRODUCTION

Since the early 1990s a number of factors have accelerated the pace of change in the global retirement landscape: growth in aging populations; Social Security systems under strain; inadequate financial preparation for retirement by many workers; exponentially increasing health care costs; and the continuous shift from defined benefit (DB) to defined contribution (DC) retirement plans. In recent years, many countries have undertaken pension reform initiatives that have focused on individual choice and self reliance in retirement planning. With these reforms has come a desire for a more complete understanding of decision making and the role of behavioral economics in the preparation and execution of a sound retirement plan.

The increased popularity of DC plans provides a unique opportunity for academics to analyze the behavioral aspects of saving decisions prior to retirement. However, with a significant portion of the Baby Boomers approaching retirement, the issue of how future retirees will spend down their accumulated assets has taken on a greater importance for policymakers around the world. One idea that has received considerable attention is annuitization, traditionally defined as exchanging accumulated assets for a lifetime

stream of guaranteed income. Despite wide-spread theoretical support for annuitization among economists, participation in annuity markets has been limited.<sup>1</sup> This report looks at the existing literature on behavioral economics, which has traditionally focused on the accumulation phase of retirement planning, and considers the applicability of some of its findings to the payout phase in order to understand how guaranteed lifetime income can be made a natural part of the retirement decision for individuals at varying income levels.

### II. A LOOK AT U.S. RETIREMENT MARKETS: PAST, PRESENT AND FUTURE

The well-being of this country's retirees has long been a concern for U.S. policymakers. The main source of retirement income for a majority of retirees - Social Security - was never intended to be the sole financial support. However, a recent study by Peter R. Orszag of the Brookings Institution (currently Director of the Congressional Budget Office) and Peter A. Diamond of the Massachusetts Institute of Technology shows that one-fifth of U.S. retirees acquire all of their income from the Social Security system, while two-thirds of retirees get half or more of their income from this source. Changing demographics, however, have

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been putting more pressure on the system. According to estimates by the Social Security Board of Trustees, if the status quo is maintained, the Social Security system will be insolvent by 2041. The resulting possibility of reductions in future Social Security benefits, combined with the obvious lack of individual savings in the U.S.,<sup>2</sup> place an even greater importance on the private pension system. **Table 1** presents a snapshot of the U.S. retirement market over the past 21 years.

decade, DC plans have been gaining in popularity. Prior to 1992, the majority of assets in employer-sponsored private pension plans were in defined benefit plans. Since then, private DC assets have exceeded private DB assets. In fact, according to data compiled by the Investment Company Institute, in 2006 the total amount of assets accumulated in private DC plans was almost twice the assets in private DB plans: \$4 trillion versus \$2.3 trillion. Several characteristics of DC plans have contributed to their popularity: contributions are tax deductible; accumulations are tax deferred; often

**Table 1** illustrates a very well-known fact: over the last

**Table 1. U.S. Total Retirement Market, 1985-2006**  
Billions of Dollars at Year-End

	IRAs	Private Defined Contribution Plans	State and Local Government Pension Plans	Private Defined Benefit Plans	Federal Pension Plans	Annuities	Total
1985	241	508	405	813	172	181	2,321
1986	329	567	481	839	202	226	2,643
1987	404	654	537	827	233	234	2,889
1988	468	719	603	831	267	291	3,180
1989	546	855	706	945	304	338	3,694
1990	637	892	739	922	340	391	3,921
1991	776	1,060	862	1,073	382	423	4,576
1992	874	1,161	948	1,098	426	473	4,980
1993	993	1,319	1,054	1,212	468	522	5,569
1994	1,056	1,406	1,107	1,303	512	526	5,911
1995	1,288	1,717	1,344	1,496	541	582	6,968
1996	1,467	1,961	1,529	1,623	606	626	7,811
1997	1,728	2,343	1,819	1,798	659	658	9,005
1998	2,150	2,640	2,062	1,948	716	818	10,334
1999	2,651	3,001	2,361	2,117	774	928	11,833
2000	2,629	2,969	2,335	2,009	797	951	11,690
2001	2,619	2,663	2,254	1,845	860	1,041	11,281
2002	2,533	2,472	1,980	1,670	894	1,001	10,550
2003	2,993e	3,043	2,394	2,025	958	1,125	12,540
2004	3,284e	3,335	2,620	2,162	1,023	1,332	13,757
2005	3,632e	3,600	2,745	2,178	1,074	1,446	14,676
2006	4,232e	4,070	3,017	2,311	1,142	1,578	16,350

Note: Federal State and Local Pension Plans include both DC and DB plans.

Source: "Appendix: Additional Data on the U.S. Retirement Market, 2006", July 2007, Vol. 16, No 3A, Investment Company Institute.

there is an employer match; they are cheaper to administer; and they are portable between jobs. The popularity of DC plans is expected to continue in the future, as well. In a 2007 study, Professors James Poterba of MIT, David A. Wise of Harvard University and Steven F. Venti of Dartmouth College project that by 2040, while total assets in all DC plans, public and private, will be around \$36 trillion (in 2000 dollars), total assets in all DB plans will only be around \$5 trillion (also in 2000 dollars).<sup>3</sup>

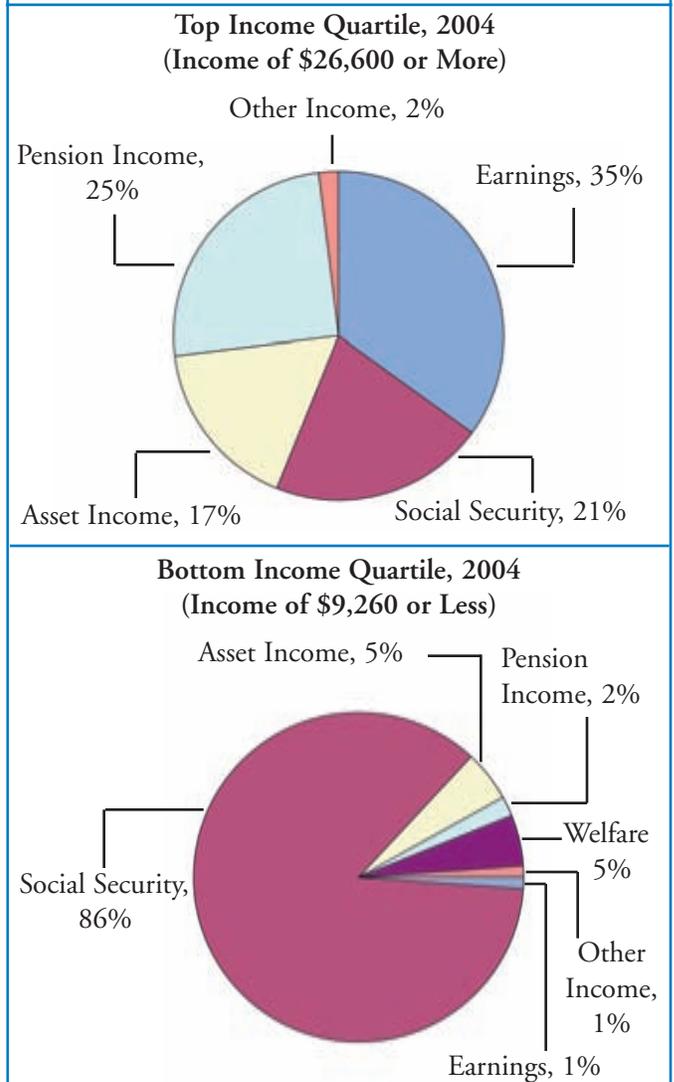
Although these projections of total retirement assets may sound impressive, they are far from adequate. Despite suggested replacement rates of pre-retirement income of 80 percent or more, many individuals have failed to adequately save for their retirement years. The 2007 Retirement Confidence Survey conducted by the Employee Benefit Research Institute (EBRI) and Mathew Greenwald & Associates, Inc., shows that, among all workers surveyed, 58 percent had savings less than \$50,000.<sup>4</sup> For workers aged 55 and over (individuals who have only a limited time remaining to save), 40 percent have less than \$50,000 in savings. Given projected increases in healthcare costs, these facts are creating considerable alarm. According to a recent study conducted by Paul Fronstin of EBRI, a 65-year-old couple with an average life expectancy can end up spending as much as \$295,000 for health insurance coverage and other out of pocket healthcare-related expenses. If the couple ends up living to age 95, the healthcare costs can amount to as much as \$550,000.

All of these changes - the Social Security system under strain, increasing healthcare costs, and the switch to a self-managed retirement saving system - raise an important question: how will retirees fare during retirement? Unfortunately, it is difficult to answer this question by assessing existing retirees, since a large percentage of current retirees get most of their income in an annuitized form such as Social Security and payments from DB plans. **Figure 1** provides the share of retirement income from different sources for the top 25% and bottom 25% of the income quartile in year 2004. While Social Security and pension income combined provide 88% of income for the bottom income quartile, their share of income for the top income quartile is only 46%. These numbers indicate the importance of guaranteed lifetime income in whatever form it takes (Social

Security, pensions or annuities), especially for low-income individuals aged 65 and over. With the decrease in DB plans and the possibility of reductions in future Social Security income, a crucial issue will be how individuals choose to supplement the decrease in annuitized income. Other sources of guaranteed income, as discussed, could help fill the gap.

Research on the well-being of current retirees is far from complete. However, a 2007 study conducted by Craig Copeland of EBRI underlines the importance of

**Figure 1. Sources of Income by Quartile, 2004  
Income of Americans Aged 65 and Over**



Source: "Topics in Aging: Income of Americans Age 65 and Older, 1969 to 2004" CRS Report for Congress, April 20, 2006.

pension and annuity income for current retirees and provides important clues for future retirees. The research concentrates on the usage of accumulated assets during retirement years and analyzes changes in income and total wealth. Using the Health and Retirement Study (HRS), Copeland shows that while 11% of individuals with \$15,000 and more in pension/annuity income experienced a decline in total wealth and household income between 1992 and 2004, the number was 20.6% for people who have no pension/annuity income (other than Social Security which is, in effect, an annuity) over the same time period. Although individuals seem to fare better with a supplemental guaranteed lifetime income, 60% of the sample had no pension/annuity income at all. Considering the risks a typical retiree faces, such as longevity, inflation and poor investment returns, this lack of annuity income is even more worrisome.

Another study conducted by Jack VanDerhei, a professor at Temple University and an EBRI fellow, discusses three important risks of retirement - investment risk, longevity, and healthcare expenses - and analyzes the income replacement rates necessary for a high probability of adequate retirement income. He also looks at how different levels of annuitization can change the outcome. **Figure 2** represents the income replacement rates necessary for a 65-year-old single male to achieve

a 90 percent chance of adequate retirement income with 50 percent of his retirement wealth invested in equities at different income levels. In this example, only investment and longevity risks are considered. As shown in **Figure 2**, increased annuitization helps decrease the required replacement rate at both low-income as well as high-income levels. For example, a male who has post-retirement income less than \$15,000 needs 209% of pre-retirement income replaced if he has no annuitized income other than social security. The percent of pre-retirement income needed to be replaced falls to 182% if he has 25% annuitization. In other words, turning some portion of retirement wealth into a guaranteed lifetime income reduces the need for greater accumulated assets at retirement compared to a case where the retiree does not annuitize at all.

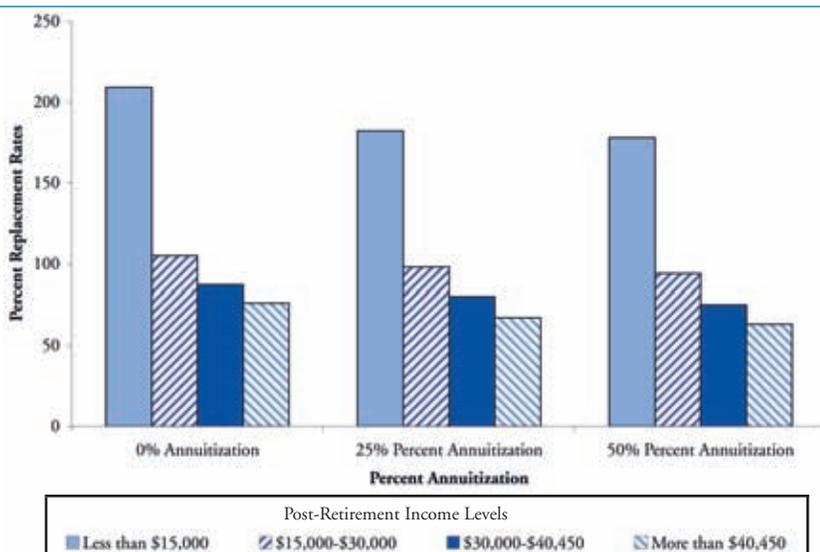
### III. WHAT DOES BEHAVIORAL ECONOMICS HAVE TO OFFER?

Most economic models are based on one very important simplifying assumption: individuals are rational decision-makers. This important assumption implies individuals have well-defined preferences that are formed by considering the true benefits and costs of available choices, and that decisions are made to maximize individual welfare using all available information.

In the presence of uncertainty, individuals use their beliefs to make decisions with available information and continuously update their beliefs whenever there is new information.

Even though this assumption has been the core of economic theory, there are many cases where individual decision-making processes can be described as anything but “rational.” These observed anomalies lead to an increased interest in behavioral economics, which analyzes the effects of cognitive and emotional biases in the decision-making process, especially in the presence of risk and uncertainty. The influential work of two psychologists, the 2002 Nobel Prize winner in economics Daniel Kahneman

**Figure 2. Impact of Annuitization on Required Replacement Rates (Males Retiring at Age 65)**



Source: Jack VanDerhei, “Measuring Retirement Income Adequacy: Calculating Realistic Income Replacement Rates,” EBRI.

of Princeton University and his co-author, Professor Amos Tversky, paved the way for modern behavioral economics. In their 1974 and 1979 research, Professors Kahneman and Tversky showed that when faced by complex problems and uncertainty, people use heuristics or rules of thumb and let psychological factors influence their decision-making process. In many cases, the resulting outcomes are less than optimal.

The increased popularity of private pension systems that specifically require individuals to undertake complex financial decisions has provided the opportunity for experiments by behavioral economists. It has been well documented that, in many cases, financial decisions are plagued by procrastination and inertia. For example, Professors Richard H. Thaler of University of Chicago and Shlomo Benartzi of The Anderson School at UCLA looked at a form of defined benefit system found in the U.K. that does not require employee contributions to acquire a full employer match. Although employees need only sign up to receive the employer match (i.e., participants need not make any contributions to receive benefits), only 51% of eligible employees participated.<sup>5</sup> A similar case was documented by Professors James C. Choi of Yale University and David Laibson and Brigitte Madrian of Harvard University. Although workers aged 59 1/2 and older can immediately withdraw their contributions to DC plans (without penalty) and keep their employer match, 40 % of the workers in the study sample failed to sign up for the plans.

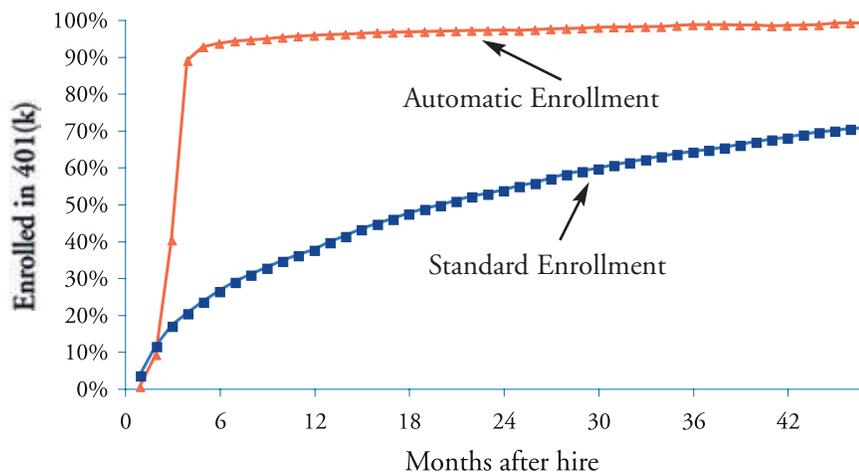
There is much merit in analyzing what causes this so-called “irrational” behavior when it comes to retirement saving. Some of the key concepts highlighted in the work of leading behavioral economists include (in no specific order of importance):

- **Self Control:** This refers to the fact that people follow their impulses or feelings rather than their reasoning. The typical example of a self-control problem in the retirement landscape is wanting to save for retirement but lacking the will to implement a plan.
- **Loss and Risk Aversion:** This refers to the fact that individuals give more weight to the prospect of losses than to the chance for an equal amount of gains. This

behavioral trait presents itself in the asset selection of retirement savings. In order to avoid losses, individuals might invest in overly conservative choices, greatly restricting the possibility of building higher account balances.

- **Hyperbolic Discounting (Time Preference):** Individuals tend to attach a higher discount rate to the short term than the long term. In other words, individuals prefer smaller amounts now over a larger amount in the future. In retirement savings, this is associated with substitution of consumption for saving.
- **Anchoring:** This is defined as a simplified mental reference to one set of facts based on past information. An example of anchoring involves the choice of contribution rates in DC plans. According to a 2001 study by Professors Choi, Laibson, Madrian and Andrew Metric of the University of Pennsylvania, absent default options, plan participants tend to choose the minimum amount that is necessary to get the full match from their employer. In many cases, this outcome is less than the optimal saving necessary for retirement security.
- **Overconfidence:** This is the bias whereby individuals tend to put too much faith in their own judgment or abilities. For example, people with this behavioral trait may believe that they can predict market performance, which results in excessive trading.
- **Regret Aversion:** People wish to avoid the regret caused by losses (both financial and emotional) associated with their own decisions. Holding on to an asset that has been losing money or trying to avoid markets that experienced recent losses but offer great deals in terms of investments can be associated with regret aversion.
- **Mental Accounting:** Individuals tend to organize their portfolios in separate mental accounts even though they belong to the same financial pool. A common example of mental accounting would be earmarking savings in multiple categories such as retirement saving, college saving or vacation saving.

**Figure 3. 401(k) Participation: Effect of Automatic Enrollment**



Source: Choi et al. 2001.

■ *Automatic Enrollment:* In recent years, an increasing number of companies have chosen to sign their workers up for the company 401(k) plan automatically. According to the 49th Annual Survey of Profit Sharing and 401(k) Plans, in 2005, 16.9 percent of companies had automatic enrollment.<sup>7</sup> The decision is reversible (i.e., workers have the right to opt out). Looking at administrative data for three companies, Professors Choi, Laibson, Madrian and Metrick compared participation trends before and after the adoption of automatic enrollment. As shown in Figure 3, there is a large immediate impact. Participation is higher under automatic

#### IV. BEHAVIORAL ECONOMICS AND RETIREMENT SAVINGS

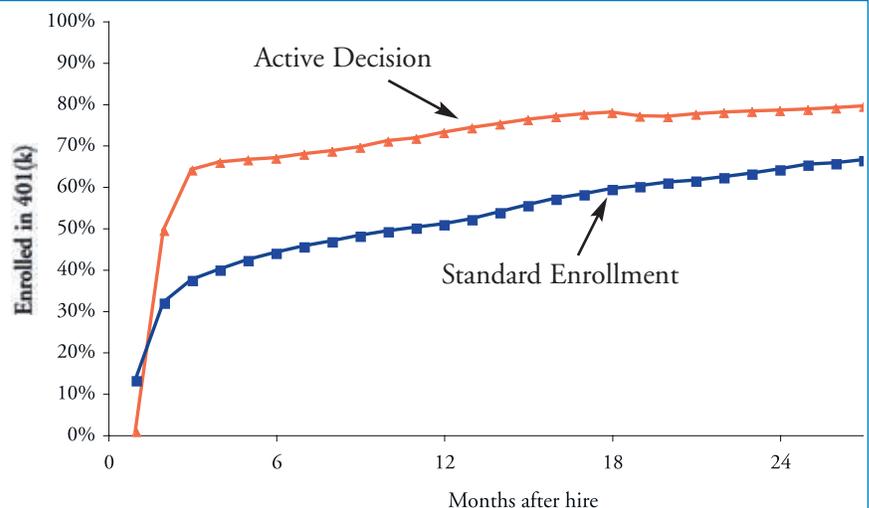
Recently, the findings of behavioral economics have been influential both in government reforms and in the design of private pension plans. Knowing the various behavioral obstacles in retirement planning, governments tend to follow a more paternalistic approach, which channels individuals in the right direction. In fact, according to a recent study, the characteristics of pension reforms and emerging pension plans can be described as “asymmetrically paternalistic.” By this, it is meant that the new rules create large benefits for those who would otherwise make errors, while having little or no impact on those who are fully rational.<sup>6</sup> The impact of behavioral economics on pension reform and design can be clearly seen on three important steps in the accumulation phase:

**1. Participation:** Retirement planning is a highly complex task. Deciding whether or not to participate in a plan is the first hurdle that workers face. Behavioral economists have looked at the pros and cons of alternative approaches for decreasing nonparticipation resulting from procrastination and inertia. These approaches include:

enrollment. The merits of this system have also been acknowledged by the Pension Protection Act of 2006, which made it easier for corporations to set up automatic enrollment. The major down-side of automatic enrollment is that people are put into default choices and rarely make any changes that might be more suitable for their specific needs.

■ *Active Decision-Making:* Another approach to increase participation among procrastinators is to design the plan such that it would require individuals to make active decisions by an explicitly stated deadline. A 2005 study by Professors Choi, Laibson, Madrian and Metrick illustrates the positive impact of this approach.

**Figure 4. 401(k) Participation: Effect of Active Decision Making**



Source: Choi et al. 2005.

Figure 4 shows that while the average participation during the first 3 months under standard enrollment was 49%, active decision enrollment was 69% for the same time period. Even though this approach produces a better outcome than standard enrollment, it does not do as well as the automatic enrollment approach, as it still requires individuals to face the complex task of retirement planning.

■ **Simplifying Choices:** The choice overload in plan designs can also be a deterrent to plan participation. For example, research by Professors Sheena S. Iyengar, Wei Jiang and Gur Huberman of Columbia Business School shows that, for every ten funds added to the choice menu, the probability of average employee participation decreases between 1.5 percent and 2 percent. Another study by Professors Choi, Laibson, Madrian and Ph.D. candidate John Beshears of Harvard University re-emphasizes this fact by showing that decreasing the choices available to workers increases participation by 10 percent to 20 percent. Even though traditional economic theory argues for the availability of numerous choices in the retirement world, behavioral economics supports simplicity and a limited number of choices.

**2. Contribution:** In general, contribution rates depend on the design of the retirement plan. Under automatic enrollment, people tend to stick with the default saving rate for the plan.<sup>8</sup> However, if the plan is a standard enrollment plan, people tend to use heuristics such as picking a contribution rate that is anchored to their employer matching rate or picking round numbers, such as multiples of 5.<sup>9</sup> Once the decision is made, plan participants rarely revisit those decisions to make changes. To overcome this shortcoming, Professors Benartzi and Thaler developed a program called “Save More Tomorrow™”, which has been adopted by many plan providers. This system actually ties the increase in contribution rates to salary increases with an automatic escalation feature. The system has been successful in increasing saving rates by taking advantage of procrastination and inertia.

**3. Asset Allocation:** Like contribution rates, asset allocation is also greatly affected by the design of the retirement plan. Under automatic enrollment, default choices dictate the outcome. In the case of standard enroll-

ment, heuristics take over. Faced by multiple asset choices, participants tend to divide their contributions equally between available options. Furthermore, faced with choice overload, workers tend to prefer safer, more conservative funds.<sup>10</sup> Today, many plan sponsors offer “lifestyle” funds that use different investment mixes to simplify the choices based on risk tolerance: conservative, moderate and high risk. One shortcoming of this strategy is that plan participants fail to recognize that each of these funds is already diversified and divide their contribution across these funds, resulting in either overexposure or underexposure of their preferred risk level.

## V. BEHAVIORAL ECONOMICS: LESSONS FOR THE RETIREMENT YEARS

Any retirement planning strategy that fails to address how to spend down accumulated assets during retirement years is far from complete. The majority of workers have no concrete plans for their golden years. As a result of the shift to DC plans, the burden of making these decisions has been moving towards the employees. Given uncertainties about the future - longevity, investment performance, health shocks, inflation - the task becomes more and more difficult. One possible solution to this problem is to integrate private annuities into retirement decision making. In combination with other assets and investment vehicles, annuities can simplify the task and provide an element of certainty about the financial future.

Behavioral economics provides valuable approaches for employers to use to simplify the decision-making process for their employees and to promote beneficial choices.

■ **Building on Automatic Enrollment:** As mentioned earlier, automatic enrollment in a company's 401(k) during the accumulation years has been proven quite effective in increasing participation. A default option of turning a specific percentage of accumulated retirement assets into an annuity would increase their uptake immensely. Just the inclusion of the choice in default options can be seen as the stamp of approval by plan providers. The drawback of defaulting a retiree into an irrevocable annuitization might be overcome by more

flexible but still guaranteed income arrangements that can be reversed by the plan participant.

■ **Active Decision-Making:** During initial enrollment for retirement plans, individuals could be given the choice of electing a percentage of their accumulated assets to be converted into an annuity upon retirement. Even though this process would have an explicitly stated date for the final decision, it should always be possible for the plan participants to revisit this in order to avoid regret aversion.

■ **Simplifying Choices:** In today’s retirement market, there are a number of annuity products with different characteristics (please refer to Appendix). Including a preselected annuity as a default option can simplify the decision-making and increase the uptake of annuities as shown by existing 401(k) research discussed in previous section.

■ **Timing of Annuitization Decision:** According to Professors Thaler and Benartzi, it is easier for individuals to accept restrictions on their future choices. The results of the 2007 Retirement Confidence Survey support the validity of this point. Survey participants aged 45 and below indicated that they would be more likely to purchase an income annuity at retirement than older workers. Incorporating the revocable decision to annuitize early in the working years rather than waiting until retirement can be a sensible way to increase annuitization.

■ **Framing of Annuitization Choice:** It is important for plan sponsors and designers to frame the annuitiza-

tion choice in the right way. When faced with the choice of taking the total amount accumulated in their retirement accounts as a lump sum payment versus a lifetime annuity, the large difference between the two amounts tends to bias retirees towards the lump sum. According to a study conducted by John T. Warner of Clemson University and Saul Pleeter of the U.S. Department of Defense, when this choice was provided during a military downsizing, 90 percent of enlisted personal chose lump sums even though extensive information about the internal rate of return on the annuity was communicated. The internal rate of return for the annuity was 17 percent, which is quite favorable compared to current stock market returns. Even the wording of the choice can be a deterrent. **Table 2** shows the likelihood of workers purchasing an annuity if they face the same option worded differently. The first statement in the table takes advantage of loss aversion by mere use of the words “guaranteed income.”

Another recent study by Wei-Yin Hu and Jason S. Scott of Financial Engines, Inc. shows the negative impact of mental accounting on annuitization decisions. According to their work, if individuals segregate annuity income from other retirement income mentally, they perceive the purchase as a gamble where a short life span of the policyholder means a loss. In that sense, it is important to emphasize the longevity insurance feature of annuities that reduces risk by reducing the need for precautionary saving and in return allows for increased consumption in retirement.

■ **Implication for Public Policy:** There are different ways to structure public policy. Tax policy can be used

**Table 2. Likelihood of Workers Purchasing an Annuity**

How likely do you think you and your spouse will be	Very Likely	Somewhat Likely	Not too Likely	Not at all Likely	Don't Know
To purchase a financial product or select a retirement plan option that will pay you guaranteed income each month for the rest of your life?	11%	39%	25%	21%	4%
To purchase an income annuity or select an annuity option from a retirement plan?	7	32	29%	27	5

Source: 2007 Retirement Confidence Survey.

to increase the demand for guaranteed lifetime income over lump sum by providing small financial incentives. On the other hand, making it easier to include annuitization choice in defaults with reforms similar to PPA could provide a similar result. Both of these policies would indicate government approval and decrease uncertainty in participants' minds.

As the needs of current and future retirees change, markets adjust accordingly. The movement towards self-reliance in retirement planning pushed markets to develop new products that can be easily tailored to individual preferences. Many of these changes take advantage of findings of behavioral economics. Guaranteed lifetime benefits (please refer to appendix for a more detailed discussion of types of guaranteed lifetime benefits) as well as death benefits offered by this new generation of products introduce flexibility and control, as well as protection against adverse investment performance that would overcome regret and loss aversion by avoiding a "bad bet" if the contract holder were to die too soon. Currently, the cost of these additional features could be high for some individuals, but as the markets develop further and competition picks up among annuity providers, this new generation of products could become increasingly more attractive in the retirement landscape.

## VI. CONCLUSIONS

Retirement planning, including figuring out how to make one's savings last as long as possible after retirement, is a difficult task, not only due to financial constraints, but also because of the behavioral restraint required for self control and the need to develop and follow a long-term plan. The findings of behavioral economics can be the key to creating an environment that will guide individuals in choosing a path to a secure and comfortable retirement. Making guaranteed lifetime income part of a retirement income portfolio could help improve retirement outcome for many individuals at varying income levels.

### APPENDIX: TYPES OF ANNUITIES\*

In today's financial market, there are a variety of annuity products that meet the specific needs of individuals

in insuring against retirement risks. Many of the newly introduced features of annuity products were designed to address some of the reasons noted above for the hesitancy of investors to annuitize. Annuity products can be classified into two main categories:

- **Immediate versus Deferred:** While immediate annuities begin paying out immediately after the payment of a single premium, deferred annuities provide for the tax-deferred accumulation of assets after the payment of a single premium, or multiple premium payments, until withdrawals are made at some set date in the future.

- **Fixed versus Variable:** Returns on fixed annuities are guaranteed and fixed during a specified period of time. In contrast, the stream of income from variable annuities depends on the underlying portfolio chosen by the annuitant, based on his or her risk preference.

In response to growing need for individuals to generate their own guaranteed income streams, annuity providers have introduced a new generation of annuity products with optional guarantees that may be added to variable annuity contracts for an additional fee. These "guaranteed living benefits," afford more flexibility and control and help address many of the investor concerns identified by behavioral economists. These optional benefits have been the leading factor in strong growth in variable annuity market, and can be classified in three main categories:

- **Guaranteed Minimum Accumulation Benefits (GMAB):** A guarantee that ensures that the value of a variable annuity contract will be at least equal to a certain minimum amount (such as the amount invested or the amount invested plus some lock-in of market gains) after a specified number of years. This protects the value of the annuity from market fluctuations.

- **Guaranteed Minimum Income Benefits (GMIB):** A guarantee that ensures, under certain conditions, that the owner may annuitize the contract based on the greatest of the actual account value, a payout base equal to premiums plus some interest rate, or the maximum anniversary value of the account prior to annuitization. This guarantees minimum lifetime monthly income payments once the contract is annuitized.

■ Guaranteed Minimum Withdrawal Benefits

(GMWB): A guarantee that ensures that a certain percentage of a guaranteed benefit base (such as paid premiums or a "greatest of three" such as that described for the GMIB) can be withdrawn annually, regardless of market performance or the actual account balance. Withdrawal percentages typically range from 5% for life to 7% for a specified period.

*\* The majority of this section is taken from "Can Annuities Enhance Retirement Lifestyles?" by Dr. Pınar Çebi Wilber.*

## NOTES

1. For further discussion, please refer to “Can Annuities Enhance Retirement Lifestyles?” by Dr. Pinar Çebi Wilber. (<http://www.accf.org/pdf/Annuities-Special-Report.pdf>).
2. According to the latest data by Bureau of Economic Analysis, the U.S. personal saving rate has been -1.2% of personal disposable income for the first two months of 2007. Negative personal savings rates have been a worrisome trend since 2005.
3. James Poterba, Steven Venti and David A. Wise, “The Decline of Defined Benefit Plans and Asset Flows”, NBER Working Paper 12834, January 2007, pg 36, Figure 8-1a.
4. Employee Benefit Research Institute, Issue Brief, “The Retirement System in Transition: The 2007 Retirement Confidence Survey”, April 2007, pg 10.
5. Richard H. Thaler and Shlomo Benartzi, “The Behavioral Economics of Retirement Savings Behavior”, pg. 2.
6. Colin Camerer, Samuel Issacharoff, George Loewenstein, Ted O’Donoghue, and Matthew Rabin, “Regulation for Conservatives: Behavioral Economics and The Case for ‘Asymmetric Paternalism’”, University of Pennsylvania Law Review, pg. 1211.
7. For companies with more than 5,000 workers, this rate was 34.3 percent. Please refer to Profit Sharing/401(k) Council of America’s web page. <http://www.pasca.org/PRESS/P2006/oct4.html>.
8. According to Beshears et al. paper, when the company of interest used 3% as the default contribution rate, so did the majority of workers. When the company switched the default to 6%, no new hires picked 3% as a contribution rate.
9. Richard H. Thaler and Shlomo Benartzi, “The Behavioral Economics of Retirement Savings Behavior”, pg. 4.
10. Sheena Iyengar and Wei Jiang, “How More Choices are Demotivating: Impact of More Options on 401(k) Investments.”

## REFERENCES

Beshears, John, James J. Choi, David Laibson and Brigitte Madrian. 2006. “Simplification and Saving.”

Working Paper 12659. Cambridge, Mass.: National Bureau of Economic Research. October.

Camerer, Colin, Samuel Issacharoff, George Loewenstein, Ted O’Donoghue, and Matthew Rabin. 2003. “Regulation for Conservatives: Behavioral Economics and The Case for ‘Asymmetric Paternalism’.” University of Pennsylvania Law Review, Vol. 151: 1211-1254.

Çebi Wilber, Pinar. 2006 “Can Annuities Enhance Retirement Lifestyles?” ACCF. Washington D.C. April. <http://www.accf.org/pdf/Annuities-Special-Report.pdf>

Choi, James J., David Laibson, Brigitte Madrian and Andrew Metrick. 2001. “For Better and Worse: Default Effects and 401(k) Savings Behavior.” Working Paper 8651. Cambridge, Mass.: National Bureau of Economic Research. December.

Choi, James J., David Laibson, and Brigitte Madrian. 2004. “\$100 Bills on the Sidewalk: Violation of No-Arbitrage in 401(k) Accounts.” Working Paper. University of Pennsylvania.

Choi, James J., David Laibson, Brigitte Madrian and Andrew Metrick. 2005. “Optimal Defaults and Active Decisions.” Working Paper 11074. Cambridge, Mass.: National Bureau of Economic Research. January.

Copeland, Craig. 2007. “How Are Retirees Doing Financially in Retirement?” EBRI. Washington D.C. February.

Diamond, Peter A., and Peter R. Orszag. 2005. “Saving Social Security: A Balanced Approach.” Brookings Institution. Washington, D.C.

Employee Benefit Research Institute. 2007. “The Retirement System in Transition: The 2007 Retirement Confidence Survey.” EBRI. Washington D.C. April.

Fronstin, Paul. 2006. “Savings Needed to Fund Health Insurance and Health Care Expenses in Retirement.” EBRI. Washington D.C. July.

Hu, Wei-Yin, and Jason S. Scott. 2007. “Behavioral Obstacles to the Annuity Market.” Pension Research Council Working Paper. The Wharton School, University of Pennsylvania.

Iyengar, Sheena S. and Wei Jiang. 2003. “How More Choices are Demotivating?: Impact of More Options

on 401(k) Investments.” Working Paper.

Iyengar, Sheena S., Wei Jiang Gur Huberman. 2003. “How Much Choice is too Much?: Contributions to 401(k) Retirement Plans.” Pension Research Council Working Paper. The Wharton School, University of Pennsylvania.

Kahneman, D. and A. Tversky. 1974. “Judgement Under Uncertainty: Heuristics and Biases.” *Science* (185): 1124-1131.

Kahneman, D. and A. Tversky. 1979. “Prospect Theory: An Analysis of Decision Making Under Risk.” *Econometrica*, 47(2): 263-291.

Poterba, James, Steven Venti and David A. Wise. 2007. “The Decline of Defined Benefit Plans and Asset Flows.” Working Paper 12834. Cambridge, Mass.: National Bureau of Economic Research. January.

Poterba, James, Steven Venti and David A. Wise. 2007. “New Estimates of the Future Path of 401(k) Assets.” Working Paper 13083. Cambridge, Mass.: National Bureau of Economic Research. May.

Purcell, Patricia and Debra B Whitman. 2006. “Topics in Aging: Income of Americans Age 65 and Older, 1969 to 2004.” CRS Report for Congress. April.

Thaler, Richard H. and Shlomo Benartzi. 2007. “The Behavioral Economics of Retirement Savings Behavior.” AARP. Washington D.C. January.

VanDerhei, Jack. 2006. “Measuring Retirement Income Adequacy: Calculating Realistic Income Replacement Rates.” EBRI. Washington D.C. September.

Warner, John T. and Saul Pleeter. 2001. “The Personal Discount Rate: Evidence from Military Downsizing Programs.” *The American Economic Review*. Vol 91(1). March.