

HOW CAN WE REALIZE THE VALUE THAT ANNUITIES OFFER IN A 401(K) WORLD?

BY STEVEN A. SASS*

Introduction

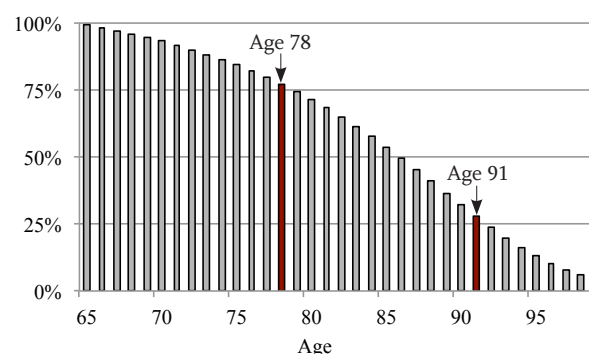
Annuities have long been the basic building blocks of the U.S. retirement income system. Both Social Security and traditional employer pensions are annuities, paying retirees a specified sum each month for as long as they live. But due to the decline in Social Security replacement rates, for any given retirement age, and the shift in employer plans from defined benefit pensions to 401(k)s, a growing number of workers are entering retirement with more financial savings and less annuity income.

Economists generally agree that many retirees would benefit if they annuitized at least some of their 401(k) savings. This *brief* reviews studies by the U.S. Social Security Administration's Retirement Research Consortium that assess how best to meet this goal. The discussion proceeds as follows. The first section presents the value that annuities offer. The second section explains how this value is affected by medical expense risk and bequest motives. The third section identifies key behavioral impediments to annuitization. The fourth section reviews initiatives that address these impediments. The fifth section concludes that accustoming 401(k) participants to focus on retirement income rather than accumulations and developing an effective default distribution for 401(k) assets are promising initiatives to explore.

The Value Annuities Offer

Annuities assure retirees an income for as long as they live. This assurance is quite valuable, as it is very hard to predict how long a given individual will live. A healthy 65-year old man in an employer pension plan has a 25-percent chance of dying by age 78, or of living to age 91 or beyond. How many people will live to a particular age, by contrast, is far more predictable. About 75 percent will live to age 78 and 25 percent to age 91 (see Figure 1). This predictabil-

FIGURE 1. PERCENTAGE OF HEALTHY MEN AGE 65 IN EMPLOYER PENSIONS WHO SURVIVE TO SPECIFIED AGES



Source: Author's calculations from Society of Actuaries Retirement Plans Experience Committee (2014).

* Steven A. Sass is a research economist at the Center for Retirement Research at Boston College. The author thanks Jorge Ramos-Mercado for excellent research assistance.

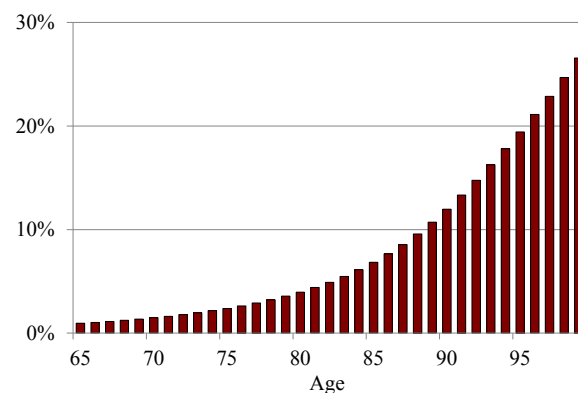
ity allows insurers to set monthly annuity payments at a level they can assure will continue as long as all in the pool are alive. Annuities work by allowing the resources of those who die to provide benefits to those who survive. These “mortality credits,” all else equal, raise monthly payments above what individuals themselves can safely draw from a given amount of savings.¹

A series of studies quantify the value that annuities provide by estimating “annuity equivalent wealth” (AEW) – the wealth retirees would need to get the same expected utility that an annuity provides.²

A pioneering study by Olivia Mitchell, James Poterba, Mark Warshawsky, and Jeffrey Brown estimates AEW assuming retirement at age 65, with half the retiree’s wealth already annuitized, and with all savings, annuitized or not, invested in riskless bonds.³ The AEW estimate for an “actuarially fair” annuity – an annuity not burdened by the costs found in commercial annuities – is 1.33. That number means that retirees pursuing an optimal drawdown strategy would need a third more wealth to get the same expected utility as an actuarially fair annuity. The study then incorporates the costs associated with commercial annuities, estimating that they reduce the present value of annuity payments by about 8 percent. This reduction lowers AEW for current annuitants to about 1.2. That is, they would need 20 percent more wealth to get the same expected utility using an optimal drawdown strategy.⁴

A study by Anthony Webb and Irena Dushi extends the analysis to include higher levels of pre-existing annuitized wealth and the option to annuitize at older ages.⁵ The study shows that the value of annuitization is quite sensitive to pre-existing annuitized wealth: the lower the level of annuitized wealth, the more valuable is the annuity’s assurance of a basic retirement income. When Social Security, defined benefit pensions, and housing accounted for most of the wealth of retirees, the costs of commercial annuities more than offset the value of the insurance they provided. When only half of a household’s wealth is annuitized, which is increasingly the case, commercial annuities do add value. The longevity insurance they provide is less valuable for couples, as couples pool longevity risk, and most individuals retire as couples. The study nevertheless finds that for couples with half their wealth pre-annuitized, commercial annuities become attractive when they are in their mid- to late-70s. Around this point, annuitant mortality rates begin to rise rapidly, accelerating from below 5 percent to above

FIGURE 2. MORTALITY RATES FOR HEALTHY MEN IN EMPLOYER PENSIONS



Source: Author’s calculations from Society of Actuaries Retirement Plans Experience Committee (2014).

10 percent for those in their 80s (see Figure 2). These rising mortality rates push up the value of annuitant mortality credits in a similar fashion.

Studies by Wolfram Horneff, Raimond Maurer, Olivia Mitchell, Ivica Dus, and Michael Stamos extend the analysis to include investments in equities.⁶ The higher expected returns on equities enhance the value of drawing an income out of savings, reducing the incentive to annuitize. But the effect is to delay, not eliminate, annuitization. For moderately risk-averse households, the optimal strategy is to annuitize when they reach their early 80s.

Delay is not the only way to buy longevity insurance at older ages, when mortality credits are most valuable. Retirees can also buy advanced life deferred annuities (ALDAs) – an annuity purchased at retirement that begins payments much later, say at age 85. A study by Guan Gong and Anthony Webb compares ALDAs to conventional annuities and finds that ALDAs provide a significant share of the value at a much lower cost.⁷ The study’s estimates show that using about one-sixth of the household’s savings to buy an ALDA at age 65, which begins payments at age 85, provides two-thirds of the insurance value of an annuity that begins payment immediately. Drawing an income out of the remaining savings to age 85, when the ALDA payments start, is also much simpler than drawing an income from savings over an uncertain lifetime. Simply drawing the same amount in real terms each year for twenty years is also nearly as good as the far more complicated “optimal” approach. Households that buy an ALDA and pursue this naïve strategy would also be better off than if they optimally decumulate or buy an immediate annuity at age 65.

Medical Expenses, Bequest Motives, and the Value of Annuitization

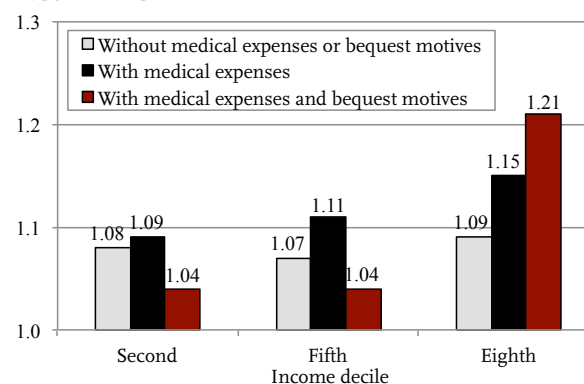
Retirees use their savings not only as a source of income. They also hold savings as precautionary reserves, primarily to cover potential medical and long-term care expenses or to be left as bequests. As savings used to buy an annuity cannot be used in an emergency or left as a bequest, these other uses are often assumed to reduce the value of annuitization.

A theoretical analysis by Thomas Davidoff, Jeffrey Brown, and Peter Diamond finds that it is optimal to hold precautionary reserves to cover medical expenses if these expenses occur early in retirement.⁸ But if they shoot up late in life, the analysis finds that households would be better off with an annuity. The reason is that consumption in an optimal drawdown declines with age, even if medical expenses rise, as the likelihood of survival declines. Annuities use mortality credits – the flip side of declining survival probabilities – to provide higher incomes at these older ages to help cover rising medical expenses.

A study by Mariacristina De Nardi, Eric French, and John Bailey Jones shows that medical expense risk indeed rises sharply at advanced ages.⁹ This pattern is especially true for higher income households most likely to have significant 401(k) balances, as they are more likely to survive to these ages, more able to pay for expensive care, and less likely to qualify for means-tested Medicaid benefits. The study also finds that retirees decumulate their savings quite slowly, consistent with a strategy of retaining precautionary reserves to cover late-life medical costs.

A study by Gaobo Pang and Mark Warshawsky confirms the hypothesis that the pattern of medical expenditures enhances, rather than diminishes, the value of annuitization.¹⁰ The study identifies the utility-maximizing mix of equity, bond, and annuity investments over the course of retirement. It finds that households maximize utility early in retirement by reducing consumption and building up precautionary reserves to cover potential near-term medical expenses. But as mortality rates and the value of mortality credits increase, the prospect of rising medical expenses down the road makes annuitization more attractive, as shown in Figure 3 in which the black bars exceed the value of the gray bars. The analysis also indicates that medical expense risk has the greatest positive effect on the value of annuities for higher income households.

FIGURE 3. ANNUITY EQUIVALENT WEALTH AND EFFECT OF MEDICAL EXPENSE RISK AND BEQUEST MOTIVES, BY INCOME DECILE



Source: Author's calculations using data from Pang and Warshawsky (2010).

In addition to medical expenses, the study also estimates the effect of bequest motives on annuity value (see the red bars in Figure 3). It finds the desire to leave a bequest reduces, but does not eliminate, the value of annuitization for low- and middle-income households (as the red bars still exceed 1.0), and actually increases the value of annuitization for higher-income households. For higher-income households, basic consumption needs take a smaller share of their income and wealth. By assuring these needs are met, annuitization allows a greater share of their wealth to be invested in equities, increasing the expected size of bequests. The study thus shows that medical expense risk and bequest motives do not negate the value of annuitization for most U.S. households – and significantly *increase* the value of annuitization for higher-income households most likely to have significant 401(k) balances.

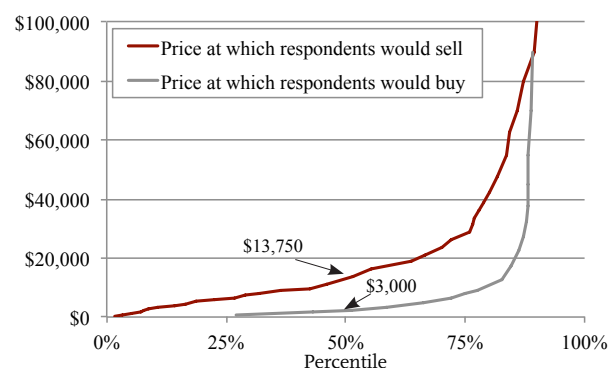
Behavioral Barriers to Annuitization

Given the value that annuities provide, economists have been puzzled by the fact that very few retirees buy them. To address this question, researchers have conducted a series of experiments that identify powerful behavioral factors that impede annuitization. Among the most potent are the ways that individuals respond to the complexity of annuitization decisions, to how the options are framed, and to the possibility of dying before reaching the “break-even” age.

Complexity of Annuitization Decisions

As the above discussion makes clear, the value that commercial annuities provide is hardly self-evident. An experiment by Jeffrey Brown, Arie Kapteyn, Erzo Luttmer, and Olivia Mitchell shows how difficult it is for the typical consumer, not versed in the latest economic research, to assess the value of a far more familiar and actuarially fair annuity – monthly Social Security benefits – and how this complexity impedes annuitization.¹¹ The experiment asked subjects to value a \$100 change in monthly benefits in two separate sessions. In one session, subjects were asked how much they would pay to buy a \$100 increase in their benefits; in the other they were asked how much they would demand to sell \$100 in monthly benefits. When value is hard to assess, people are only willing to buy or sell at a “very good” price. The median price the subjects were willing to pay, \$3,000, was dramatically less than their \$13,750 median selling price (see Figure 4), indicating significant difficulty in assessing the value of the \$100 monthly benefit.¹²

FIGURE 4. “BUY” AND “SELL” PRICES FOR A HYPOTHETICAL \$100 CHANGE IN SOCIAL SECURITY BENEFIT



Source: Brown et al. (2013).

How the Options Are Framed

Given the difficulty retirees have in assessing the value of an annuity, it is not surprising that the way annuities are presented affects how they are valued. In an experiment by Jeffrey Brown, Jeffrey Kling, Sendhil Mullainathan, and Marian Wrobel, subjects were asked to choose between an annuity and a draw-

down option, with the choice presented to half the subjects in a consumption frame and to the other half in an investment frame.¹³

- The consumption frame presented the options solely in terms of how much retirees could spend and never mentioned the \$100,000 used to generate that income. Subjects were told that option A (the annuity) allowed retirees to spend \$650 a month for life, and the payments would stop at death. Option B (the drawdown option) allowed retirees to spend a greater or smaller amount each month at their discretion. With Option B, they were told that if they spent \$650 a month they would run out of money at age 85 but that reducing monthly spending to \$400 would ensure that they had enough for life. Regardless of the amount they decided to spend under Option B, any funds remaining at death would be left as a bequest.
- The investment frame presented the choice in terms of how much an investment of \$100,000 earns and the retiree’s access to the funds invested. Option A (the drawdown option) earns 4-percent, allows retirees to access their funds at any time, and any funds remaining at death are left as a bequest. In option B (the annuity), retirees invest \$100,000 in an account that earns \$650 a month, the amount that they receive. In addition, they were told that they could not access the funds invested, and the earnings would stop at death with the investment then worth nothing.

Although the options are essentially the same in either frame, 72 percent preferred the annuity when presented in the consumption frame, versus only 21 percent when presented in the investment frame.

Prospect of Dying Before “Break-even” Age

Loss aversion is a powerful behavioral impulse, and an experiment by Julie Agnew, Lisa Anderson, Jeffrey Gerlach, and Lisa Szykman highlights its significance in annuitization decisions.¹⁴ The experiment asked subjects to choose between an annuity and an investment option after viewing one of three five-minute slide shows. One emphasized “potential financial losses associated with investing in the stock market;” the second emphasized “losses associated with purchasing an annuity and dying early before recouping the benefits;” and the third was neutral and did

not highlight a risk of loss. The results show that: 1) highlighting the risk of loss in the stock market made men, but not women, more likely to choose the annuity; and 2) highlighting the risk of dying before recouping the benefits of annuitization made both men and women more likely to reject the annuity. The results identify loss aversion – an aversion to exchanging money in-hand for payments that could terminate “prematurely” – as a potent impediment to annuitization.¹⁵

How Can We Realize the Value Annuities Provide?

Given the value that annuities provide, helping households overcome the behavioral impediments to annuitization has become an important policy objective. Several proposed initiatives could help.

The government requires 401(k) plans to send participants periodic statements reporting their account balance, a requirement that puts retirement planning in an investment frame. The government has announced its intention to require these statements to also report the lifetime income streams these balances could provide, with monthly amounts calculated based on the availability of an actuarially fair annuity.¹⁶ While such annuities are not available in the marketplace, this requirement puts retirement planning in a consumption frame and provides a benchmark for assessing other ways of drawing an income out of savings at retirement. At retirement, other proposals would:

- Require 401(k) and IRA providers to offer annuitization options, perhaps from a government-sponsored clearinghouse similar to the recently established health insurance exchanges. This provision would greatly simplify the task of shopping for an annuity; lower the price of an annuity by reducing marketing costs and perhaps also adverse selection; and provide greater assurance that the insurer is financially sound.
- Allow participants to annuitize just a portion of their balance. A survey by John Beshears, James Choi, David Laibson, Brigitte Madrian, and Stephen Zeldes found that a substantial share of respondents would annuitize a portion of their savings in response to a desire “to make sure I have enough income later in life” while retaining the remainder in response to a desire for “flexibility in the timing of my spending.”¹⁷

- Make an annuity the default distribution of a portion of the participant’s balance at retirement. Defaults significantly increase the share of workers who contribute to a 401(k), and a properly designed default could significantly increase the share of workers who purchase an annuity.

That properly designed default could well be an ALDA, an annuity explicitly designed to assure an income later in life, combined with a simple drawdown program to the age at which ALDA payments begin.¹⁸ An ALDA provides most of the longevity insurance an immediate annuity provides, takes only a portion of a participant’s savings, and greatly simplifies the task of drawing an income out of the retiree’s remaining savings. The Treasury Department aimed to encourage the use of ALDAs in 2014 when it exempted ALDAs purchased with 401(k)/IRA savings (up to a maximum of \$125,000) from the Internal Revenue Service’s required minimum distribution rules.¹⁹ An ALDA default would not suit all participants, and all would be free to opt out. But it should suit most, and could be attractive enough for most to accept.

Conclusion

Given the value that annuities provide, the shift to less annuitized income from Social Security (at any given retirement age) and employer defined benefit plans is a significant loss for workers now entering retirement. While commercial annuities have higher costs and are subject to adverse selection, they provide significant value at older ages when mortality rates rise and those who survive are likely to incur significant medical expenses. Realizing that value will not be easy, given the powerful behavioral impediments to annuitization. Nevertheless, encouraging 401(k) participants to view retirement planning through a consumption frame and making an ALDA the default distribution for a portion of account balances are promising initiatives to explore.

Endnotes

1 Yaari (1965).

2 Annuity equivalent wealth should be seen as a lower bound on the value that annuities provide, as it assumes that retirees who do not annuitize would use an *optimal* drawdown strategy identified using sophisticated numerical techniques – a strategy that retirees are clearly ill equipped to identify.

3 Mitchell, et al. (1999).

4 Annuitants tend to have above-average longevity. Median life expectancy at age 65 is 18 years for all men and 21 years for male annuitants. As annuity payments are based on annuitant mortality, this “adverse selection” reduces the value of commercial annuities for retirees with average longevity. The study estimated that the expected present value of annuity payments for individuals with average longevity fell to about 83 percent of the price of the annuity. While annuitization remains advantageous for individuals with average longevity, AEW falls to about 1.1 (see Bell and Miller 2005 and U.S. Department of the Treasury, Internal Revenue Service 2013). But as workers entering retirement with significant 401(k) balances tend to have above-average longevity, the study’s results suggest that most would benefit by annuitizing at least some of their savings.

5 Dushi and Webb (2004).

6 Horneff, Maurer, and Stamos (2006), Horneff et al. (2008), and Horneff et al. (2009).

7 Gong and Webb (2010). Also see Horneff and Maurer (2008).

8 Davidoff, Brown, and Diamond (2005).

9 De Nardi, French, and Jones (2006).

10 Pang and Warshawsky (2010).

11 Brown, Kapteyn, Luttmer, and Mitchell (2013).

12 The difficulty in assessing the value of an annuity is indicated by the fact that the median price at which the subjects were willing to sell was less than the expected present value of future benefits (\$17,000) and even further below annuity equivalent wealth – the savings needed to get the same expected utility using an optimal drawdown strategy (\$22,500) – using the 1.33 AEW factor estimated in Mitchell et al. (1999).

13 Brown et al. (2008).

14 Agnew, et al. (2008).

15 Also see Brown, Kapteyn, and Mitchell (2016) and Payne, et al. (2015).

16 U.S. Department of Labor, Employee Benefits Security Administration (2013).

17 Beshears, et al. (2014).

18 See Ambachtsheer (2016) for one such proposal, which includes a gradual transition from accumulation to decumulation.

19 U.S. Department of the Treasury (2014).

References

- Agnew, Julie R., Lisa R. Anderson, Jeffrey R. Gerlach, and Lisa R. Szykman. 2008. "Who Chooses Annuities? An Experimental Investigation of the Role of Gender, Framing, and Defaults." *American Economic Review* 98(2): 418-422.
- Ambachtsheer, Keith. 2016. "Solving the 'Annuity Puzzle': It's All in How You Ask the Question." *The Ambachtsheer Letter*, February. Toronto, ON: KPA Advisory Services.
- Bell, Felicitie C. and Michael L. Miller. 2005. *Life Tables for the United States Social Security Area 1900-2100*. Actuarial Study No. 120. Office of the Chief Actuary. Baltimore, MD: Social Security Administration.
- Beshears, John, James J. Choi, David Laibson, Brigitte C. Madrian, and Stephen P. Zeldes. 2014. "What Makes Annuitization More Appealing?" *Journal of Public Economics* 16: 2-16.
- Brown, Jeffrey R., Arie Kapteyn, Erzo F.P. Luttmer, and Olivia S. Mitchell. 2013. "Cognitive Constraints on Valuing Annuities." WP 19168. Cambridge, MA: National Bureau of Economic Research.
- Brown, Jeffrey R., Arie Kapteyn, and Olivia S. Mitchell. 2016. "Framing and Claiming: How Information-Framing Affects Expected Social Security Claiming Behavior." *Journal of Risk and Insurance* 83(1): 139-162.
- Brown, Jeffrey R., Jeffrey R. Kling, Sendhil Mullainathan, and Marian V. Wrobel. 2008. "Why Don't People Insure Late Life Consumption? A Framing Explanation of the Under-Annuitization Puzzle." WP 13748. Cambridge, MA: National Bureau of Economic Research.
- Davidoff, Thomas, Jeffrey R. Brown and Peter A. Diamond. 2005. "Annuities and Individual Welfare," *American Economic Review* 95(5): 1573-1590.
- De Nardi, Mariacristina, Eric French, John Bailey Jones. 2006. "Differential Mortality, Uncertain Medical Expenses, and the Saving of Elderly Singles." WP 12554. Cambridge, MA: National Bureau of Economic Research.
- Dushi, Irena and Anthony Webb. 2004. "Household Annuitization Decisions: Simulations and Empirical Analysis." *Journal of Pension Economics and Finance* 3(2): 109-43.
- Gong, Guan and Anthony Webb. 2010. "Evaluating the Advanced Life Deferred Annuity – An Annuity People Might Actually Buy." *Insurance: Mathematics and Economics* 46: 210-221.
- Horneff, Wolfram J. and Raimond H. Maurer. 2008. "Deferred Annuities and Strategic Asset Allocation." Working Paper 2008-178. Ann Arbor, MI: University of Michigan Retirement Research Center.
- Horneff, Wolfram J., Raimond Maurer, Olivia Mitchell, and Ivica Dus. 2008. "Following the Rules: Integrating Asset Allocation and Annuitization in Retirement Portfolios." *Insurance: Mathematics and Economics* 42: 396-408.
- Horneff, Wolfram J., Raimond H. Maurer, Olivia S. Mitchell, and Michael Z. Stamos. 2009. "Asset Allocation and Location over the Life Cycle with Survival-Contingent Payouts." *Journal of Banking & Finance* 33(9): 1688-1699
- Horneff, Wolfram J., Raimond Maurer, and Michael Stamos. 2006. "Life-Cycle Asset Allocation With Annuity Markets: Is Longevity Insurance a Good Deal?" *Journal of Economic Dynamics and Control* 32(11): 3590-3612.
- Mitchell, Olivia S., James M. Poterba, Mark Warshawsky, and Jeffrey R. Brown. 1999. "New Evidence on the Money's Worth of Individual Annuities." *American Economic Review* 89(5): 1299-1318.

- Pang, Gaobo and Mark Warshawsky. 2010. "Optimizing the Equity-Bond-Annuity Portfolio in Retirement: The Impact of Uncertain Health Expenses." *Insurance: Mathematics and Economics* 46: 198-209.
- Payne, John W., Suzanne Shu, Elizabeth Webb, and Namika Sagara. 2015. "Individual Heterogeneity in Loss Aversion and Its Impact on Social Security Claiming Decisions." NB 15-07. Cambridge MA: NBER Retirement Research Center.
- Society of Actuaries Retirement Plans Experience Committee. 2014. *RP-2014 Mortality Tables Report*. Schaumburg, IL: Society of Actuaries.
- U.S. Department of Labor, Employee Benefits Security Administration. 2013. "Fact Sheet: Lifetime Income Illustration." Washington, DC: U.S. Department of Labor. Available at: <http://www.dol.gov/ebsa/newsroom/fsanprm.html>
- U.S. Department of the Treasury, Internal Revenue Service. 2013. "Updated Static Mortality Tables for the Years 2014 and 2015." Notice 2013-49. Available at: <https://www.irs.gov/pub/irs-drop/n-13-49.pdf>
- U.S. Department of the Treasury. 2014. "Treasury Issues Final Rules Regarding Longevity Annuities." Press Center Release, July 1. Available at: <https://www.treasury.gov/press-center/press-releases/Pages/jl2448.aspx>
- Yaari, Menahem E. 1965. "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer," *Review of Economic Studies* 32(2): 137-50.

About the Center

The mission of the Center for Retirement Research at Boston College is to produce first-class research and educational tools and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception in 1998, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

Affiliated Institutions

The Brookings Institution
Massachusetts Institute of Technology
Syracuse University
Urban Institute

Contact Information

Center for Retirement Research
Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467-3808
Phone: (617) 552-1762
Fax: (617) 552-0191
E-mail: crr@bc.edu
Website: <http://crr.bc.edu>

© 2016, by Trustees of Boston College, Center for Retirement Research. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that the author is identified and full credit, including copyright notice, is given to Trustees of Boston College, Center for Retirement Research.

The research reported herein was performed pursuant to a grant from the U.S. Social Security Administration (SSA) funded as part of the Retirement Research Consortium. The opinions and conclusions expressed are solely those of the author and do not represent the opinions or policy of SSA or any agency of the federal government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of the contents of this report. Reference herein to any specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply endorsement, recommendation or favoring by the United States Government or any agency thereof.