

## Why Don't People Insure Late-Life Consumption? A Framing Explanation of the Under-Annuitization Puzzle

By JEFFREY R. BROWN, JEFFREY R. KLING, SENDHIL MULLAINATHAN,  
AND MARIAN V. WROBEL\*

According to standard economic models, a risk-averse consumer who faces uncertainty about length of life should place a high value on life annuities that provide guaranteed income for life. Yet numerous studies show that few consumers voluntarily annuitize their retirement savings. As public and private pension systems around the world continue the shift from traditional defined benefit plans, which typically pay benefits for life, to defined contribution structures, which rarely require annuitization, retirees find themselves increasingly exposed to longevity risk—the risk of being unable to sustain their consumption should they live longer than expected.

Numerous papers have attempted to resolve the puzzle of why so few individuals purchase life annuities despite the large individual welfare gains predicted by economic models (for a review of this literature, see Jeffrey R. Brown 2007). Studies have explored the role of high prices and asymmetric information, high fractions of wealth already annuitized by public pension plans, bequest motives and other forms of risk sharing within families, the option value of delayed annuitization, and incomplete

annuity markets, including the absence of inflation protection, the inability to insure against medical expenditure or other consumption shocks, and the limited ability to access the equity premium while annuitizing. By combining a number of these factors, it is possible to rationalize very low demand in some specific contexts.

As a whole, however, the literature has failed to find a sufficiently general explanation of consumer aversion to annuities. Many proposed “solutions” simply create new puzzles. For example, family risk-sharing implies that annuity demand should increase upon the death of one spouse, yet we do not observe this. Nor do we observe significantly different annuitization propensities between those who self-proclaim strong bequest motives and those who do not. Several hypotheses suggest that annuitization is optimal only at more advanced ages, yet we do not observe a substantial fraction of the population annuitizing at older ages. Additionally, the industry has created life annuities that overcome many of the product-based objections (e.g., inflation-protected annuities, annuities with payout streams linked to equity returns, policy riders that provide benefits for long-term care expenses), and yet few consumers buy these products.

Rather than attempting to rationalize the lack of annuity demand, this paper explores the idea that aversion to annuities is not a fully rational phenomenon. A large literature has documented behavioral biases in a wide range of activities that are important steps in the process of planning for retirement, including whether to participate in employer sponsored pension plans, how much to save, and how to allocate one's portfolio. To the extent that individuals exhibit biases in the wealth accumulation aspects of planning for retirement, it seems natural that similar biases might also extend to the wealth decumulation stage of retirement planning.

\* Brown: University of Illinois at Urbana-Champaign, 340 Wohlers Hall, MC-706, 1206 S. Sixth Street, Champaign, IL 61820, and NBER (e-mail: brownjr@uiuc.edu); Kling: Brookings Institution, 1775 Massachusetts Avenue, NW, Washington, DC 20036, and NBER (e-mail: jkling@brookings.edu); Mullainathan: Department of Economics, Harvard University, Littauer 208, Cambridge, MA 02138, and NBER (e-mail: mullain@fas.harvard.edu); Wrobel: Institute for Quantitative Social Science, Harvard University, 1737 Cambridge Street, Cambridge, MA 02138 (e-mail: mwrobel@iq.harvard.edu). We thank Abby Bookman and Garth Wiens for exceptional research assistance. We are grateful to the Pew Charitable Trusts and the TIAA-CREF Research Institute for support research. Kling also thanks the MacArthur and Mott Foundations for support. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the Pew Charitable Trusts, the TIAA-CREF Institute, or the MacArthur or Mott Foundations.

### I. The Framing Hypothesis

This paper suggests that a psychologically richer model of consumer behavior can explain under-annuitization. Since the development of prospect theory, economists have increasingly understood the importance of framing in economic decisions (Amos Tversky and Daniel Kahneman 1981). While loss/gain asymmetry—the differential responses when a choice is framed as a loss than when it is framed as a gain—is the most commonly discussed example, framing is a more general phenomenon. Put simply, experimental findings suggest that choices are not based solely on material consequences, but instead are filtered through the particular *frame* that individuals use to interpret the choices.

To understand our model of framing, it is useful to start with the standard, fully rational model. Suppose an individual planning for retirement maximizes the discounted sum of each period's utility of consumption:  $\sum_{t=0}^T \delta^t u(c_t)$ , where  $u(c_t)$  is concave,  $\delta < 1$  is the discount factor, and  $T$  (time of death) is a stochastic variable. In this setting, annuities provide valuable insurance by transferring resources from states where resources have no value (death) to states where resources provide utility through consumption. This is most easily seen in the two-period case where the individual has probability  $q$  of dying. If this individual invests wealth  $W$  in a simple bond with a return  $R$ , he can consume  $W(1 + R)$  in the second period. If, in contrast, he buys an actuarially fair life annuity, he is able to consume  $W(1 + R)/(1 - q)$  if he lives, which, by assumption, is all he cares about. To understand why the annuity allows for higher consumption, imagine all individuals pool their wealth at time 1 and share it among all survivors at time 2; this generates a mortality premium.

The model above implicitly has two components: an investment component, in which the individual decides how much to invest in each asset, and a consumption component, in which she decides how to spend the money from that investment. We propose that instead of viewing the problem through the *consumption frame* (focusing on the end result of what can be spent over time), many consumers adopt an *investment frame* (focusing on the intermediate results of return and risk features when

choosing assets and not considering the consequences for consumption). This assumption is closely related to the notion of choice bracketing and mental accounting (Richard H. Thaler 1985; Daniel Read, George Loewenstein, and Matthew Rabin 1999). Consumers effectively isolate one choice (how to invest) from others (how to consume) and focus on specific features of this choice, rather than viewing it as part of a broader, integrated set of choices. Specifically, suppose that individuals consider the rate of return and the variance of payouts, a natural frame for someone investigating alternative approaches to investing for retirement. In the example above, a bond has return  $R$  and poses no risk, since it pays the same irrespective of state. On the other hand, the annuity has a return  $(1 + R)/(1 - q)$  with probability  $1 - q$ , and return 0 with probability  $q$ . If the annuity is actuarially fairly priced and individuals have rational expectations about mortality, then the annuity has expected return  $R$ . Yet despite having the same return, the annuity appears *riskier* than the bond. *This reversal is key to our hypothesis: under the consumption frame, the annuity is attractive because it serves as a form of insurance. In contrast, under the narrow investment frame, the annuity is viewed as being riskier than a bond because its return depends on a random variable  $T$ .*

Practically, this framework suggests that the unattractive feature of the annuity in the investment frame will be the potential for the investment to lose money. This matches the qualitative intuition that practitioners provide: people react negatively to the possibility that they could lose money. Indeed, if an individual dies immediately after annuity purchase, he could lose his entire principal. Although not necessary for our analysis, loss aversion can strengthen this fear, as noted by Wei-Yin Hu and Jason S. Scott (2007). The possibility of loss is particularly problematic because the annuity does not offer a higher expected return to offset this extra "risk." This insight is also consistent with industry market research that has found that many consumers think of annuities as a "gamble" rather than as insurance. In fact, the annuity is even less attractive: life annuity payouts are typically less than actuarially fair due to administrative costs and adverse selection, meaning that the higher risk is bundled with a lower return. In addition, the risk of adverse selection also necessitates that

most annuity contracts are essentially irreversible, resulting in illiquidity.

To summarize, we argue that when choosing how to invest their money, individuals focus too narrowly on risk and return. The annuity, when viewed in this narrow investment frame, looks risky and unattractive. In the next section we test this hypothesis.

## II. Testing the Framing Hypothesis

In this paper, we provide a preliminary test of the framing hypothesis. We created descriptions of potential scenarios to be presented to potential consumers, some of which represent annuities and some of which represent competing non-annuitized products (such as a savings account). The essence of the test is that some of the subjects are presented these products in an investment frame, which emphasizes the depersonalized return on an account by using words such as “invest” and “earnings,” describing periods in terms of years, mentioning the value of the initial investment (\$100,000 in every case), and alluding to the account value at other points in the description. The other subjects are presented these products in a consumption frame, meaning that they are told how much each product would ultimately allow its purchaser to consume and for how long, using words such as “spend” and “payment,” describing periods in terms of the purchaser’s age, and never alluding to an account or its value. The key distinction is that the consumption frame shifts the frame: instead of simply considering the returns on the investment, individuals are presented with the consumption consequences of the investment. The consumption frame implicitly incorporates the results of investment decisions, as well as the time path of consumption, and, in this sense, is broader. The framing hypothesis suggests that the life annuity should be attractive in the consumption frame and unattractive in the investment frame.

We collected data to test this hypothesis in a four-arm Internet survey conducted in December 2007. The Internet survey firm Zoomerang hosted the survey and recruited respondents over age 50 from a pre-existing panel of individuals willing to participate in surveys in return for small incentives. A total of 1,342 individuals, approximately 335 per arm, completed the survey. All respondents answered

seven forced-choice questions. Each question described the investment/spending decisions of two fictitious people and asked, “Who has made the better choice?” In all arms of the survey, an introduction stated that both people receive \$1,000 each month from Social Security, have “some savings,” and have already set aside money for their children. The presence of savings and money for the children were intended to address respondents’ potential concerns about insurance from consumption shocks and bequests. In a real-life setting, such concerns could be addressed via partial annuitization.

Two arms of the survey presented the introduction and the choices using the investment frame, and two arms used the consumption frame. Brown et al. (2007) provide the exact wording of the products and the frames. In all four arms of the survey, the choices were described in terms of amounts and durations: the specific terms “annuity,” “savings account,” and “bond” were not used for labels. Several choices were compared in all arms: (a) a life annuity paying \$650 each month until death; (b) a traditional savings account bearing 4 percent interest; (c) a consol bond paying \$400 each month forever; (d) a 35-year period annuity paying \$500 each month; and (e) a 20-year period annuity paying \$650 each month. In all four arms of the survey, each respondent compared the life annuity separately to each of the other products. In addition, in the investment frame, each respondent compared a principal-protected life annuity (i.e., a life annuity that guaranteed enough payments so that the nominal value of the principal would be repaid even in the event of an early death) paying \$625 each month to the traditional savings account. All choices were designed to be actuarially equivalent, and respondents were informed of this fact. To avoid spurious effects, the survey included several other comparisons that did not feature the life annuity, varied the order of the comparisons, and varied whether the life annuity was presented first or second within a given comparison.

To further address the role of the bequest motive in suppressing annuitization, we added an additional dimension of variation in the survey. Half of the respondents in each frame were told that, after death, remaining earnings or payments went to charity (the weak bequest condition); the other half that they went to children (the strong bequest condition).

We note that while our survey results are based on hypothetical scenarios, these scenarios are very similar to actual financial decisions that respondents and people they know have made. This stands in sharp contrast to the frequently used (and criticized) contingent valuation situations, which attempt to value the existence of things outside of normal experience. Robert B. Barsky et al. (1997) showed that data on stated preferences regarding risk tolerance and consumption path preferences were related in sensible ways to predicted behaviors. More generally, in a review of studies using stated preference data versus revealed preference data, Jordan J. Louviere, David A. Hensher, and Joffre D. Swait (2002) found that estimates of parameters based on the two types of data are often quite similar. An advantage of this approach is that we can obtain stated preferences over alternatives that may not be offered in a market (and for which there are no revealed preferences) but that are constructed to directly test our hypothesis. While we do not intend these stated preference data to be conclusive, the results are useful for guiding future research, possibly including experiments using actual product choices.

### III. Results

When questions were presented in the consumption frame, the majority of individuals preferred the consumption stream consistent with a life annuity to the consumption streams available from other products of comparable actuarial value. Specifically, in this frame, when individuals were told that any payments after death went to charity, 72 percent of respondents preferred the \$650 per month that could be provided by a life annuity to the consumption stream from a savings account of comparable actuarial value. Of respondents, 77 percent preferred the life annuity to receiving \$650 per month for 20 years (age 85); 76 percent preferred the life annuity to receiving \$500 per month for 35 years (age 100); and 71 percent preferred the life annuity to receiving \$400 forever (the consol bond).

In contrast, when individuals faced the same choices in the investment frame, the proportions reversed, with the majority of individuals *not* choosing the life annuity. Specifically, only 21 percent of respondents preferred an account earning \$650 each month for life (i.e., a life annuity) to investing \$100,000 at 4 percent.

Further, only 48 percent preferred the life annuity to an account earning \$650 per month for 20 years; 40 percent preferred the life annuity to an account earning \$500 per month for 35 years; and only 27 percent preferred the life annuity to an account earning a 5 percent interest rate from which interest but not invested money could be withdrawn. Note that in the life and period annuity cases, the respondent was explicitly told that, at the end, the investment would be worth nothing. In every case, the difference in rates between the consumption and investment frames was statistically significant.

In order to explore the direct effect of bequest motives, as well as any interaction between bequests and framing, we also randomized the treatment of bequests in our sample. When individuals were told that remaining payments went to children, rather than to charity, the percentages of respondents preferring the life annuity in the consumption frame declined, although it remained above 50 percent in most cases. Specifically, 59 percent of respondents preferred the life annuity to a savings account; 65 percent preferred the life annuity to \$650 per month to age 85; 53 percent preferred the life annuity to \$500 per month to age 100; and 49 percent preferred the life annuity to \$400 “forever.” Importantly, however, the percentages of respondents preferring the life annuity also fell in the investment frame so that the magnitude of the between-frame differences remained quite similar. Thus, across both a strong and a weak framing of bequests, we find a substantially larger fraction of the population finds annuities attractive when framed in consumption, rather than investment, terms.

While the strong effect of the frame on the stated preferences for life annuities is the key finding of the survey, our research also provides insights into how the framing affects various features of the annuity product. Specifically, there are at least two distinct features of a life annuity that distinguish it from a savings account: (a) the conversion from flexible access to money (i.e., “liquidity” in the investment frame) to a fixed stream of payments; and (b) the application of the mortality premium to the annuity payments. We are able to isolate the effect of each of these factors by comparing alternative products within each frame.

In the consumption frame, we find that the loss of flexibility did not have much impact on

the respondents' evaluation of choices. Similar, albeit slightly lower, percentages of respondents preferred the life annuity to the savings account (flexible access) as preferred the life annuity to the period-certain annuity (fixed payment). In contrast, the loss of flexibility did matter in the investment frame: a smaller fraction of respondents chose the life annuity over the savings account than chose the life annuity over the period-certain annuity.

We also find that the mortality premium, which arises from pooling mortality risk, was a positive attribute in the consumption frame, with respondents consistently favoring life annuities relative to period-certain annuities. In contrast, the mortality premium was viewed neutrally or negatively in the investment frame, with respondents split equally on the choice of a life or 20 year annuity and a majority disliking the life annuity relative to its 35 year counterpart. These attitudes are consistent with our hypothesis: a dislike of illiquidity and loss of control are salient in the investment frame, but not in the consumption frame. Similarly, a desire to insure against longevity risk is salient in the consumption frame but not the investment frame.

Our survey also indicates that principal protection is highly valued in the investment frame: in the weak bequest condition, 47 percent of respondents believe that a principal-protected life annuity earning \$625 per month is a better choice than a savings account, while only 21 percent believe that an unprotected life annuity dominates. The result is more dramatic in the strong bequest arm. Again, this high valuation is consistent with our hypothesis, and specifically with an aversion to the loss of wealth with a reference point at the amount of the initial investment.

#### IV. Conclusion

We hypothesize that framing matters for annuitization decisions: in a consumption frame, annuities are viewed as valuable insurance, whereas in an investment frame, the annuity is a risky asset because the payoff depends on an uncertain date of death. Survey evidence is consistent with our hypothesis that framing matters: the vast majority of individuals prefer an annuity over alternative products when presented in a consumption frame, whereas the

majority of individuals prefer non-annuitized products when presented in an investment frame. To the extent that the investment frame is the dominant frame for consumers making financial planning decisions for retirement, this finding may help to explain why so few individuals annuitize.

This finding provokes the immediate question: if framing matters, why don't annuity providers use the consumption frame? We conjecture that the investment frame is the dominant frame in the market and in most younger customers' minds, both because it is simpler, due to the focus on nearer-term and impersonal outcomes, and because little is lost by using this frame during the wealth accumulation stage of life. We further conjecture that firms tend not to "convert" retirement-age customers to the consumption frame for several reasons: resources are required to incorporate additional personalized information and thus convert consumers to a more complex frame; a given firm may not capture the return from raising a customer's interest in particular products in the consumption frame because the converted customer can purchase from another lower-cost seller; the compensation of sales staff (e.g., through commissions) may be oriented to products most consonant with investment frame and the compensation system may involve sales people outside the direct control of a given firm; and invoking the consumption frame may undermine demand for the firm's other non-life-contingent products. Exploration of these conjectures would be valuable future work.

#### REFERENCES

- Barsky, Robert B., F. Thomas Juster, Miles S. Kimball, and Matthew D. Shapiro.** 1997. "Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study." *Quarterly Journal of Economics*, 112(2): 537-79.
- Brown, Jeffrey R.** 2007. "Rational and Behavioral Perspectives on the Role of Annuities in Retirement Planning." National Bureau of Economic Research Working Paper 13537.
- Brown, Jeffrey R., Jeffrey R. Kling, Sendhil Mullainathan, and Marian V. Wrobel.** 2007. "Why Don't People Insure Late Life Consumption? A Framing Explanation of

- the Under-Annuitization Puzzle." National Bureau of Economic Research Working Paper 13748.
- Hu, Wei-Yin, and Jason S. Scott.** 2007. "Behavioral Obstacles to the Annuity Market." *Financial Analysts Journal*, 63(6): 71–82.
- Louviere, Jordan J., David A. Hensher, and Joffre D. Swait.** 2002. *Stated Choice Methods*. Cambridge, UK: Cambridge University Press.
- Read, Daniel, George Loewenstein, and Matthew Rabin.** 1999. "Choice Bracketing." *Journal of Risk and Uncertainty*, 19(1–3): 171–97.
- Thaler, Richard.** 1985. "Mental Accounting and Consumer Choice." *Marketing Science*, 4(3): 199–214.
- Tversky, Amos, and Daniel Kahneman.** 1981. "The Framing of Decisions and the Psychology of Choice." *Science*, 211(4481): 453–458.

**This article has been cited by:**

1. Căzilia Loibl, Barbara Summers, Simon McNair, Wändi Bruine de Bruin. 2018. Pension Freedom Day in the United Kingdom: Early evaluation of consumer response. *International Journal of Consumer Studies* 14. . [[Crossref](#)]
2. Servaas van Bilsen, A. Lans Bovenberg. 2018. The decumulation period of a personal pension with risk sharing: investment approach versus consumption approach. *Journal of Pension Economics and Finance* 71, 1-30. [[Crossref](#)]
3. Nikolai Dokuchaev. 2018. A gap between rational annuitization price for producer and price for customer. *Journal of Revenue and Pricing Management* 66. . [[Crossref](#)]
4. Suzanne B. Shu, Stephen D. Shu. 2018. The Psychology of Decumulation Decisions During Retirement. *Policy Insights from the Behavioral and Brain Sciences* 5:2, 216-223. [[Crossref](#)]
5. Hippolyte d'Albis, Emmanuel Thibault. 2018. Ambiguous life expectancy and the demand for annuities. *Theory and Decision* 85:3-4, 303-319. [[Crossref](#)]
6. Terence J. McElvaney, Peter D. Lunn, Féidhlim P. McGowan. 2018. Do Consumers Understand PCP Car Finance? An Experimental Investigation. *Journal of Consumer Policy* 41:3, 229-255. [[Crossref](#)]
7. Hazel Bateman, Christine Eckert, Fedor Iskhakov, Jordan Louviere, Stephen Satchell, Susan Thorp. 2018. Individual Capability and Effort in Retirement Benefit Choice. *Journal of Risk and Insurance* 85:2, 483-512. [[Crossref](#)]
8. John Beshears, James J. Choi, David Laibson, Brigitte C. Madrian. Behavioral Household Finance 177-276. [[Crossref](#)]
9. MONIKA BÜTLER, KIM PEIJNENBURG, STEFAN STAUBLI. 2017. How much do means-tested benefits reduce the demand for annuities?. *Journal of Pension Economics and Finance* 16:04, 419-449. [[Crossref](#)]
10. LANS BOVENBERG, THEO NIJMAN. 2017. Personal pensions with risk sharing. *Journal of Pension Economics and Finance* 16:04, 450-466. [[Crossref](#)]
11. Christoph Merkle, Philipp Schreiber, Martin Weber. 2017. Framing and retirement age: The gap between willingness-to-accept and willingness-to-pay. *Economic Policy* 32:92, 757-809. [[Crossref](#)]
12. Kim Peijnenburg, Theo Nijman, Bas J.M. Werker. 2017. Health Cost Risk: A Potential Solution To the Annuity Puzzle. *The Economic Journal* 127:603, 1598-1625. [[Crossref](#)]
13. Ivo Vlaev, Antony Elliott. Defining and Influencing Financial Capability 187-205. [[Crossref](#)]
14. Jeremy Pincus, Katherine Hopewood, Robert Mills. 2017. Framing the decision to buy long-term care insurance: losses and gains in the context of statistical and narrative evidence. *Journal of Financial Services Marketing* 22:1, 33-40. [[Crossref](#)]
15. Raimond Maurer, Olivia S. Mitchell, Ralph Rogalla, Tatjana Schimetschek. 2017. W ILL T HEY T AKE THE M ONEY AND W ORK ? P EOPLE'S W ILLINGNESS TO D ELAY C LAIMING S OCIAL S ECURITY B ENEFITS FOR A L UMP S UM. *Journal of Risk and Insurance* 5. . [[Crossref](#)]
16. Hazel Bateman, Christine Eckert, Fedor Iskhakov, Jordan Louviere, Stephen Satchell, Susan Thorp. 2017. Default and naive diversification heuristics in annuity choice. *Australian Journal of Management* 42:1, 32-57. [[Crossref](#)]
17. Jing Ai, Patrick L. Brockett, Linda L. Golden, Wei Zhu. 2016. Health State Transitions and Longevity Effects on Retirees' Optimal Annuitization. *Journal of Risk and Insurance* 66. . [[Crossref](#)]
18. Philipp Schreiber, Martin Weber. 2016. Time inconsistent preferences and the annuitization decision. *Journal of Economic Behavior & Organization* 129, 37-55. [[Crossref](#)]

19. Kim Peijnenburg, Theo Nijman, Bas J.M. Werker. 2016. The annuity puzzle remains a puzzle. *Journal of Economic Dynamics and Control* **70**, 18-35. [[Crossref](#)]
20. Trond Døskeland, Lars Jacob Tynes Pedersen. 2016. Investing with Brain or Heart? A Field Experiment on Responsible Investment. *Management Science* **62**:6, 1632-1644. [[Crossref](#)]
21. Katharine G Abraham, Benjamin H Harris. 2016. The Market for Longevity Annuities. *The Journal of Retirement* **3**:4, 12-27. [[Crossref](#)]
22. KYONGHEE LEE. 2016. Analysis of payout choice from individual deferred annuities in Korea. *Journal of Pension Economics and Finance* **15**:02, 224-248. [[Crossref](#)]
23. Suzanne B. Shu, Robert Zeithammer, John W. Payne. 2016. Consumer Preferences for Annuity Attributes: Beyond Net Present Value. *Journal of Marketing Research* **53**:2, 240-262. [[Crossref](#)]
24. Hazel Bateman, Christine Eckert, John Geweke, Jordan Louviere, Stephen Satchell, Susan Thorp. 2016. Risk Presentation and Portfolio Choice. *Review of Finance* **20**:1, 201-229. [[Crossref](#)]
25. Piet de Jong, Shauna Ferris. 2016. SM Bonds-A New Product for Managing Longevity Risk. *Journal of Risk and Insurance* . [[Crossref](#)]
26. Christian Knoller. 2016. MULTIPLE REFERENCE POINTS AND THE DEMAND FOR PRINCIPAL-PROTECTED LIFE ANNUITIES: AN EXPERIMENTAL ANALYSIS. *Journal of Risk and Insurance* **83**:1, 163-179. [[Crossref](#)]
27. Jeffrey R. Brown, Arie Kapteyn, 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. [[Crossref](#)]
28. Charles Sutcliffe. Annuities 247-299. [[Crossref](#)]
29. O.S. Mitchell, J. Piggott. Workplace-Linked Pensions for an Aging Demographic 865-904. [[Crossref](#)]
30. B. Kaschützke, R. Maurer. Investing and Portfolio Allocation for Retirement 567-608. [[Crossref](#)]
31. H. Fang. Insurance Markets for the Elderly 237-309. [[Crossref](#)]
32. Michael A Guillemette, Terrance K Martin, Benjamin F Cummings, Russell N James. 2016. Determinants of the Stated Probability of Purchase for Longevity Insurance. *The Geneva Papers on Risk and Insurance - Issues and Practice* **41**:1, 4-23. [[Crossref](#)]
33. Felix Reichling, Kent Smetters. 2015. Optimal Annuitization with Stochastic Mortality and Correlated Medical Costs. *American Economic Review* **105**:11, 3273-3320. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]
34. Mark J Warshawsky. 2015. Distribution Methods for Assets in Individual Accounts for Retirees: Life Income Annuities and Withdrawal Rules. *The Journal of Retirement* **3**:2, 105-122. [[Crossref](#)]
35. Bruce A. Babcock. 2015. Using Cumulative Prospect Theory to Explain Anomalous Crop Insurance Coverage Choice. *American Journal of Agricultural Economics* **97**:5, 1371-1384. [[Crossref](#)]
36. JAMES BANKS, ROWENA CRAWFORD, GEMMA TETLOW. 2015. Annuity choices and income drawdown: evidence from the decumulation phase of defined contribution pensions in England. *Journal of Pension Economics and Finance* **14**:04, 412-438. [[Crossref](#)]
37. Johannes Hagen. 2015. The determinants of annuitization: evidence from Sweden. *International Tax and Public Finance* **22**:4, 549-578. [[Crossref](#)]
38. Thomas Davidoff. 2015. Can "High Costs" Justify Weak Demand for the Home Equity Conversion Mortgage?. *Review of Financial Studies* **28**:8, 2364-2398. [[Crossref](#)]
39. Mark J Warshawsky. 2015. Illustrating Retirement Income for Defined Contribution Plan Participants: A Critical Analysis of the Department of Labor Proposal. *The Journal of Retirement* 150717051158006. [[Crossref](#)]



40. Mark J Warshawsky. 2015. Illustrating Retirement Income for Defined Contribution Plan Participants: A Critical Analysis of the Department of Labor Proposal. *The Journal of Retirement* 3:1, 12-26. [[Crossref](#)]
41. Julie R. Agnew, Lisa R. Anderson, Lisa R. Szykman. 2015. An Experimental Study of the Effect of Market Performance on Annuitization and Equity Allocations. *Journal of Behavioral Finance* 16:2, 120-129. [[Crossref](#)]
42. Luigi Guiso. 2015. A Test of Narrow Framing and its Origin. *Italian Economic Journal* 1:1, 61-100. [[Crossref](#)]
43. Ivo Vlaev, Jeroen Nieboer, Steve Martin, Paul Dolan. 2015. How behavioural science can improve financial advice services. *Journal of Financial Services Marketing* 20:1, 74-88. [[Crossref](#)]
44. EDMUND CANNON, RALPH STEVENS, IAN TONKS. 2015. Price efficiency in the Dutch Annuity Market. *Journal of Pension Economics and Finance* 14:01, 1-18. [[Crossref](#)]
45. Robert L. Clark, Melinda Sandler Morrill, David Vanderweide. 2014. Defined benefit pension plan distribution decisions by public sector employees. *Journal of Public Economics* 116, 73-88. [[Crossref](#)]
46. John Beshears, James J. Choi, David Laibson, Brigitte C. Madrian, Stephen P. Zeldes. 2014. What makes annuitization more appealing?. *Journal of Public Economics* 116, 2-16. [[Crossref](#)]
47. Shinichi Nishiyama, Kent Smetters. 2014. Financing Old Age Dependency. *Annual Review of Economics* 6:1, 53-76. [[Crossref](#)]
48. Costanza Nosi, Antonella D'Agostino, Margherita Anna Maria Pagliuca, Carlo Alberto Pratesi. 2014. Saving for Old Age: Longevity annuity Buying Intention of Italian Young Adults. *Journal of Behavioral and Experimental Economics* . [[Crossref](#)]
49. Catherine Donnelly, Montserrat Guillén, Jens Perch Nielsen. 2014. Bringing cost transparency to the life annuity market. *Insurance: Mathematics and Economics* 56, 14-27. [[Crossref](#)]
50. Andreas Richter, Jörg Schiller, Harris Schlesinger. 2014. Behavioral insurance: Theory and experiments. *Journal of Risk and Uncertainty* 48:2, 85-96. [[Crossref](#)]
51. Jeffrey R Brown, Scott J Weisbenner. 2014. Defined Contribution Plans as a Foundation for Retirement Security. *The Journal of Retirement* 1:4, 22-45. [[Crossref](#)]
52. Antoine Bommier, François Le Grand. 2014. Too risk averse to purchase insurance?. *Journal of Risk and Uncertainty* 48:2, 135-166. [[Crossref](#)]
53. David Blake, Tom Boardman. 2014. Spend More Today Safely: Using Behavioral Economics to Improve Retirement Expenditure Decisions With S P E E D O M E T E R Plans. *Risk Management and Insurance Review* 17:1, 83-112. [[Crossref](#)]
54. Jeffrey R. Brown. 2014. Income as the Outcome: How to Broaden the Narrow Framing of U.S. Retirement Policy. *Risk Management and Insurance Review* 17:1, 7-16. [[Crossref](#)]
55. John Scott, Jeffrey Diebold. 2014. Annuities, Credits and Deductions: An Experimental Test of the Relative Strength of Economic Incentives. *The Journal of Retirement* 1:3, 77-96. [[Crossref](#)]
56. HAZEL BATEMAN, CHRISTINE ECKERT, JOHN GEWEKE, JORDAN LOUVIERE, STEPHEN SATCHELL, SUSAN THORP. 2014. Financial competence, risk presentation and retirement portfolio preferences. *Journal of Pension Economics and Finance* 13:01, 27-61. [[Crossref](#)]
57. VANYA HORNEFF, BARBARA KASCHÜTZKE, RAIMOND MAURER, RALPH ROGALLA. 2013. Welfare implications of product choice regulation during the payout phase of funded pensions. *Journal of Pension Economics and Finance* 1-25. [[Crossref](#)]
58. Giuseppe Cappelletti, Giovanni Guazzarotti, Pietro Tommasino. 2013. What Determines Annuity Demand at Retirement?. *The Geneva Papers on Risk and Insurance - Issues and Practice* 38:4, 777-802. [[Crossref](#)]

59. Jeffrey R Brown, Jeffrey R Kling, Sendhil Mullainathan, Marian V Wrobel. 2013. Framing Lifetime Income. *The Journal of Retirement* 1:1, 27-37. [[Crossref](#)]
60. Darren Duxbury, Barbara Summers, Robert Hudson, Kevin Keasey. 2013. How people evaluate defined contribution, annuity-based pension arrangements: A behavioral exploration. *Journal of Economic Psychology* 34, 256-269. [[Crossref](#)]
61. John W. Payne, Namika Sagara, Suzanne B. Shu, Kirstin C. Appelt, Eric J. Johnson. 2013. Life expectancy as a constructed belief: Evidence of a live-to or die-by framing effect. *Journal of Risk and Uncertainty* 46:1, 27-50. [[Crossref](#)]
62. Eline van der Heijden, Tobias J. Klein, Wieland Müller, Jan Potters. 2012. Framing effects and impatience: Evidence from a large scale experiment. *Journal of Economic Behavior & Organization* 84:2, 701-711. [[Crossref](#)]
63. J. Chalmers, J. Reuter. 2012. How Do Retirees Value Life Annuities? Evidence from Public Employees. *Review of Financial Studies* 25:8, 2601-2634. [[Crossref](#)]
64. Ulrike Doerr,, Katharina Schulte. 2012. Betting on a Long Life – the Role of Subjective Life Expectancy in the Demand for Private Pension Insurance of German Households. *Schmollers Jahrbuch* 132:2, 233-263. [[Crossref](#)]
65. Paul Dolan, Antony Elliott, Robert Metcalfe, Ivo Vlaev. 2012. Influencing Financial Behavior: From Changing Minds to Changing Contexts. *Journal of Behavioral Finance* 13:2, 126-142. [[Crossref](#)]
66. Lee M. Lockwood. 2012. Bequest motives and the annuity puzzle. *Review of Economic Dynamics* 15:2, 226-243. [[Crossref](#)]
67. Julie Richardson Agnew. Pension Participant Behavior 577-594. [[Crossref](#)]
68. James Poterba,, Steven Venti,, David Wise. 2011. The Composition and Drawdown of Wealth in Retirement. *Journal of Economic Perspectives* 25:4, 95-118. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]
69. Jeffrey R. Brown,, Amy Finkelstein. 2011. Insuring Long-Term Care in the United States. *Journal of Economic Perspectives* 25:4, 119-142. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]
70. Shlomo Benartzi,, Alessandro Previtero,, Richard H. Thaler. 2011. Annuitization Puzzles. *Journal of Economic Perspectives* 25:4, 143-164. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]
71. Ting Wang, Virginia R. Young. 2011. Optimal commutable annuities to minimize the probability of lifetime ruin. *Insurance: Mathematics and Economics* . [[Crossref](#)]
72. Carlotta Balestra, Davide Dottori. 2011. Aging society, health and the environment. *Journal of Population Economics* . [[Crossref](#)]
73. JOHN BESHEARS, JAMES J. CHOI, DAVID LAIBSON, BRIGITTE C. MADRIAN. 2011. Behavioral economics perspectives on public sector pension plans. *Journal of Pension Economics and Finance* 10:02, 315-336. [[Crossref](#)]
74. Jason S. Scott, John G. Watson, Wei-Yin Hu. 2011. What Makes a Better Annuity?. *Journal of Risk and Insurance* 78:1, 213-244. [[Crossref](#)]
75. Charles Hsu, William Kross. 2011. The Market Pricing of Special Items That Are Included in versus Excluded from Street Earnings\*. *Contemporary Accounting Research* no-no. [[Crossref](#)]
76. Kyonghee Lee, Jooho Sung. 2010. A New Korean Defined Contribution Plan Framework to Enhance Retirement Income Security: Combining Lifecycle Funds with Compulsory Annuitisation. *The Geneva Papers on Risk and Insurance Issues and Practice* 35:S1, S50-S67. [[Crossref](#)]
77. Roman N. Schulze, Thomas Post. 2010. Individual Annuity Demand Under Aggregate Mortality Risk. *Journal of Risk and Insurance* 77:2, 423-449. [[Crossref](#)]

78. Zvi Bodie, Jérôme Detemple, Marcel Rindisbacher. 2009. Life-Cycle Finance and the Design of Pension Plans. *Annual Review of Financial Economics* 1:1, 249-286. [[Crossref](#)]