

# ARE COGNITIVE CONSTRAINTS A BARRIER TO ANNUITIZATION?

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## Introduction

With the shift from defined benefit pensions to 401(k) plans, individuals are increasingly responsible not only for saving for retirement but also for drawing down their assets in retirement. These drawdown decisions require substantial cognitive effort and are very difficult for the average person. Yet most models of asset decumulation ignore the possibility that individuals may differ in their decision-making abilities. Indeed, many models suggest that consumers facing the risk of outliving their resources should find annuities of substantial value, but few people buy them. Researchers have advanced a host of plausible explanations for the limited take-up. But no single factor, or combination of factors, has solved the puzzle.

This *brief*, based on a recent study, examines whether consumers do not buy annuities because they find them hard to value.<sup>1</sup> Specifically, this research explores whether individuals differ in their ability to value a stream of annuity income relative to a lump sum, and whether this ability is correlated with measures of cognitive ability. These findings raise questions about whether consumers are able to make well-informed choices when confronted with a decision about whether to buy an annuity.

The discussion proceeds as follows. The first section briefly reviews the annuity literature. The second section describes an experiment to identify how difficult it is for individuals to value an annuity. The third section presents the results of the experiment. The final section concludes that annuities are hard for individuals to value, particularly those with lower cognitive ability.

## Annuities and Cognitive Limitations

Annuities allow individuals to exchange a lump sum of wealth for an income stream that is guaranteed to last for life. Many studies have shown that the insurance feature of annuities is valuable and that an optimal decumulation path in retirement would involve annuitizing a very large fraction of assets.<sup>2</sup> These models, however, typically assume fully rational individuals who engage in sophisticated optimizing behavior in the face of uncertainty.

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Yet a large and growing literature relates limitations in financial literacy and decision-making abilities to economic behavior. For example, researchers have found that households make mistakes when managing their financial affairs and often lack basic financial knowledge.<sup>3</sup> Research has also shown that financial literacy is correlated with investing in financial markets as well as participating in a retirement plan.<sup>4</sup> Yet other work has documented that cognitive abilities help explain retirement wealth accumulation.<sup>5</sup> Taken together, these and many other studies suggest that people differ in their financial decision-making abilities and that these differences are important correlates of financial well-being late in life.

Specific to annuities, an emerging line of research suggests that retirees may not be making rational, well-informed decisions. A series of studies have examined the decisions of workers with defined benefit pensions who were given the option of taking a lump sum of similar actuarial value.<sup>6</sup> Unlike retirees with 401(k) plans, who almost never choose to annuitize, most studies find that well over half of retirees with DB pensions keep their annuities. This result may suggest a strong bias in favor of the pre-existing default – rather than rational, well-informed decisions.

Behavioral experiments show that individuals can be steered toward or away from annuities depending on how the product is described. In one experiment, choosing an annuity was much more popular when it was presented in a “consumption” frame, which stressed the ability to consume for life, compared to an “investment” frame, which emphasized guaranteed returns for life. Another study found that men were more easily swayed than women. The fact that individuals are significantly influenced by framing and that gender has a large effect also implies that annuities are not easily valued.<sup>7</sup> These types of studies suggest that many individuals may have difficulty in making rational decisions about annuities, perhaps due both to the complexity of the product and their own cognitive limitations.

## Methodology and Data

To test whether decision-making abilities influence annuitization decisions, 2,210 individuals from the American Life Panel, a sample broadly representative

of the U.S. population, were asked to value hypothetical changes in their monthly Social Security benefit.<sup>8</sup> Social Security benefits are annuities that essentially all Americans know and understand. These benefits also lack complications found in private market annuities, such as the absence of inflation protection and counterparty risk. Individuals should thus find it easier to value a change in their Social Security benefit than a private market annuity.

Respondents in the experiment were asked to value both an increase and a decrease in their current (or expected) monthly benefit. To value an increase, as a starting point, they were asked if they would pay \$20,000 to raise their benefit by \$100 a month. Depending on their answer, the amount was raised or lowered until the respondents identified a specific price they were willing to pay. To value a decrease, respondents were asked if they would accept \$20,000 in exchange for a \$100 cut in their monthly benefit, with the amount adjusted until it reached a price the respondents would accept to sell the \$100 monthly annuity.

In theory, the value that individuals place on an annuity would be the same whether they were buying or selling. However, if valuing an annuity is difficult, research indicates that individuals will only be willing to buy or sell when the deal is clearly advantageous: the respondents would only be willing to buy an additional \$100 a month at a low price, and would only sell \$100 a month at a higher price. Thus, the gap between the two prices should be significant, and the gap should widen as cognitive ability declines. The results, described in the next section, do show such a gap, along with the expected relationship with cognitive ability. As other factors could influence how individuals value annuities, the study also conducted a series of tests to examine competing explanations, which provide supporting evidence for the baseline results.

## Evidence on How Individuals Value Annuities

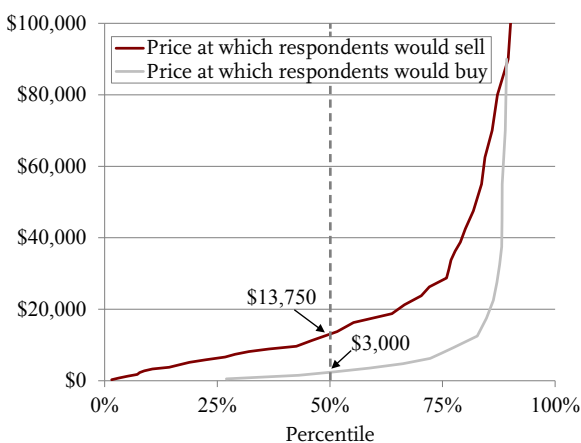
The results of the baseline experiment are consistent with the notion that the respondents had difficulty valuing a \$100 change in their Social Security annuity. Figure 1 on the next page presents the amounts that respondents were willing to pay and the amounts

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Valuing annuities is hard, especially for  
individuals with less cognitive ability.

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FIGURE 1. “BUY” AND “SELL” PRICES FOR A HYPOTHETICAL \$100 CHANGE IN SOCIAL SECURITY BENEFIT



Note: The figure does not display the top decile of the distribution, which has valuations exceeding \$100,000.  
Source: Brown et al. (2015).

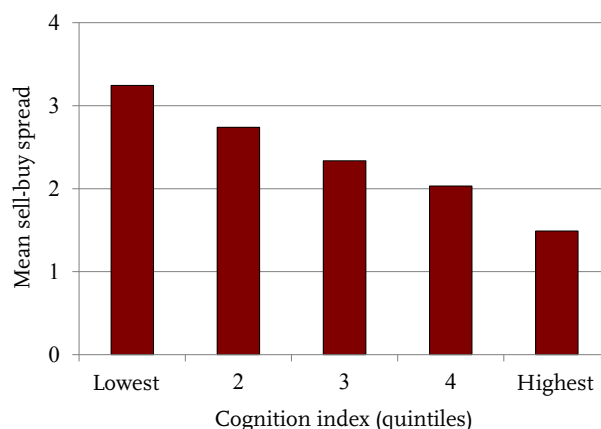
they were willing to accept for a \$100 change in their monthly benefit. The figure shows that most respondents were only willing to buy the \$100 annuity when the price was very low. The median price they were willing to pay was \$3,000 – an amount they would recoup in monthly payments in just two and a half years. And they were only willing to sell the \$100 annuity at a much higher price: the median selling price was \$13,750. As a point of reference, the actuarial value of \$100 in Social Security benefits – using mortality and interest rate assumptions from the Social Security Administration’s Trustees – is \$16,855.<sup>9</sup>

Also consistent with the notion that valuing annuities is hard is the wide variation in these prices among the respondents, especially the prices that they were willing to accept to sell \$100 in monthly benefits. About 5 percent would accept \$1,500 or less – an amount far too low to be explained by any rational economic model. At the other extreme, about 15 percent of respondents demanded at least \$60,000 and more than 6 percent at least \$200,000. In the latter case, even if the lump sum yielded only 0.6 percent above inflation, just the *interest earnings* on this amount would replace the foregone Social Security benefit, leaving the \$200,000 untouched.

If the gap between the buying and selling prices in Figure 1 were due to the difficulty of valuing annuities, it should be larger for those with more limited cognitive ability. Figure 2 shows the relationship

between a broad measure of cognition – which covers financial literacy, numerical ability, and education level – and the gap between the logs of the prices that individuals are willing to buy and sell the \$100 change in Social Security benefits. As expected, those with lower cognition do have a larger gap.<sup>10</sup> Regression analysis confirmed this pattern.

FIGURE 2. GAP BETWEEN ANNUITY “BUY” AND “SELL” PRICES BY COGNITIVE ABILITY



Note: The gap is the absolute value of the difference between the log sell valuation and the log buy valuation of a \$100 change in monthly Social Security benefits.  
Source: Brown et al. (2015).

While these findings are consistent with the notion that complexity and limited cognitive ability make it difficult for individuals to value a stream of annuity payments, other factors could also be responsible. The study thus conducted a series of tests to gauge the robustness of the findings. Three of these tests are described below.<sup>11</sup>

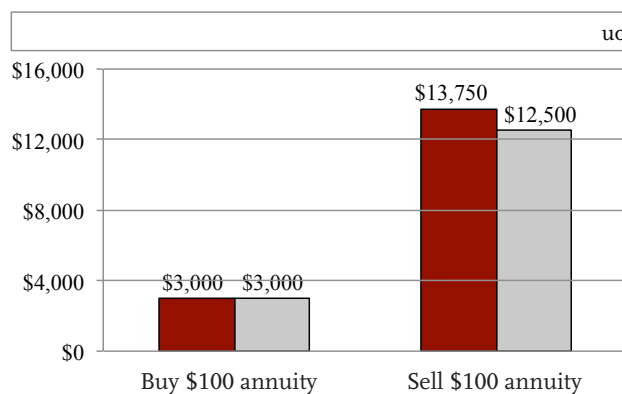
### Do Participants Simply Prefer What They Have?

Previous research has shown that individuals tend to place a higher value on items that they already have; this inclination toward the status quo is known as the “endowment effect.” For example, individuals who are given a coffee mug will sell it only at a much higher price than the price that they would pay for the mug if they did not have it.<sup>12</sup> A similar effect could be impeding individuals from buying or selling the \$100 of monthly Social Security benefits.

To test for the endowment effect, the respondents were given an offer that was financially identical to the baseline offer, but this time the choice was not framed in the same way – i.e., it was *not* posed as a contrast between the status quo benefit and a change in that benefit. Instead, the choice was between two scenarios that both involved a change in the respondents' finances. Specifically, they were asked: 1) whether, *in addition to their base benefit*, they would prefer a \$20,000 lump-sum payment *or* an additional \$100 a month in their Social Security annuity; and 2) whether they would rather pay \$20,000 *or* give up \$100 a month from their base benefit. If the endowment effect is a significant factor behind the baseline responses in Figure 1, then removing the status quo reference from the question should elicit responses that differ from the baseline amounts.

Interestingly, the responses turned out to be very similar.<sup>13</sup> When the status quo reference was removed, the median price that respondents were willing to pay for a \$100 increase in monthly benefits remained \$3,000 and the median amount they were willing to accept in exchange for a \$100 cut declined only slightly, from \$13,750 to \$12,500 (see Figure 3). This finding suggests that endowment effects do not explain the observed results.

FIGURE 3. MEDIAN “BUY” AND “SELL” PRICES FOR QUESTION FRAMING WITH AND WITHOUT REFERENCE TO THE STATUS QUO



Source: Brown et al. (2015).

### *Are Participants Cash Strapped?*

Another factor that could affect the particularly low amounts that respondents are willing to pay for an additional \$100 in annuity income is their own lack of financial resources. Those with such a “liquidity constraint” might respond – even to the hypothetical questions in the experiment – by offering only a modest amount.

The experiment tested for liquidity constraints by asking respondents about their ability to come up with the money needed to pay for the additional \$100 in annuity income. Only 18 percent of respondents said that they were unable to come up with more money than they had agreed to pay. And half of this constrained group said that they would not pay more *even if they had the money*, so liquidity was not influencing their valuations. Finally, even when those with a liquidity constraint are excluded from the sample, a clear gap in valuations persists.

### *Are Participants Affected by Changes in Question Cues?*

If annuities are hard to value, participants may be affected by question cues – such as the starting value of the dollar amounts or the ordering of questions – that have no relevance to the financial deal being offered. The intuition here is that those with insufficient knowledge to determine the value of the annuity may be distracted by the cues, causing them to anchor their responses to the amounts used in the question.

To test for anchoring effects, various dollar amounts used in the baseline questions were changed. For example, these tests included: 1) varying the initial amount of the lump sum from \$20,000 to \$30,000 or \$10,000; and 2) changing the order in which different sizes of the annuity increment were offered; for example, asking the respondent to value a \$500 increase in Social Security benefits before valuing the baseline amount of \$100. Regression analysis was then used to test how these changes affected the price at which respondents would sell their annuity. The results showed large, statistically significant anchoring effects. Specifically, using an initial lump sum of \$30,000 increased respondents' “sell” price by

nearly 20 percent. And asking respondents to value a larger annuity amount before the baseline amount increased the baseline sell price by about 70 percent. Separate regressions were run on those in the top and bottom quintiles of the cognition index, with the results suggesting that those with lower cognition are more sensitive to anchoring effects. In short, the effects of the irrelevant cues support the notion that respondents found it hard to value the annuity and thus were easily swayed.

## Conclusion

Many individuals have difficulty valuing annuities and, as a result, may only actively buy an annuity when offered a very good deal. This finding is especially true for individuals with less cognitive ability. The findings suggest that the observed lack of annuitization does not necessarily mean that people are better off without annuities.

The results are directly relevant to current policy debates. For example, U.S. policymakers have expressed interest in encouraging annuitization of balances in 401(k) plans, and a debate has emerged over whether to encourage or discourage “de-risking” efforts by corporate defined benefit pensions that allow retirees to choose a lump sum instead of an annuity. The findings of this study indicate that policymakers need to be aware that many individuals, on their own, are unable to make good decisions about managing their money in retirement.

## Endnotes

- 1 Brown et al. (2015).
- 2 See Yaari (1965); Davidoff, Brown, and Diamond (2005); and Peijnenburg, Nijman, and Werker (2010a; 2010b).
- 3 Lusardi and Mitchell (2014) provide a comprehensive overview of the literature.
- 4 For the propensity to invest in financial markets, see, for example, Arrondel, Debbich, and Savignac (2013). For retirement plan participation, see Fornero and Monticone (2011).
- 5 McArdle, Smith, and Willis (2011) and Banks, O’Dea, and Oldfield (2010).
- 6 See Hurd and Panis (2006); Benartzi, Previtro, and Thaler (2011); and Büttler and Teppa (2007).
- 7 See Brown et al. (2008) and Agnew et al. (2008).
- 8 For respondents who had not yet claimed, the study provided a projected benefit based on their earnings and self-reported expected claiming age.
- 9 Estimates that incorporate the insurance value provided by Social Security benefits are somewhat higher.
- 10 The analysis also tested the effects of the individual components of the cognition index and found similar results.
- 11 Brown et al. (2015) provides a more thorough discussion of these and other robustness tests.
- 12 Kahneman, Knetsch, and Thaler (1991).
- 13 These similarities are particularly striking because respondents were given the alternative offers and the baseline offers two weeks apart to reduce the likelihood that one set of responses would influence the other.

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