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Research Brief

Framing, Reference Points, and Preferences for Life Annuities

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Abstract

Although rational models of risk-averse consumers have difficulty explaining limited annuity demand, we have shown in previous work that re-framing the decision in consumption terms rather than investment terms significantly increases the relative attractiveness of life annuities. In this paper we test the relative effectiveness of our two framing contexts when different reference points are introduced, testing for loss aversion in both investment and consumption frames. We find that the positive effect of the consumption frame on annuity preferences is unchanged when the frame includes an annuity purchase price, confirming that this effect was not driven by the omission of the most obvious investment-oriented reference point. Similarly, manipulations of other reference points (the level of principal protection in the investment frame or the level of habitual spending in the consumption frame) have minimal effects. Taken together, these findings provide little evidence that reference points are an important determinant of annuity demand in either frame. They also confirm our prior finding on the importance of consumption versus investment framing on the attractiveness of life annuities.

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A long line of research has examined the role that life annuities – insurance products that convert a lump-sum of wealth into guaranteed lifelong income – play in the portfolios of consumers. As noted in Brown (2007), however, the literature has yet to explain fully why observed rates of annuitization are so far below those generated in most life-cycle models. In prior work (*Brown et al 2008*), we provided evidence that the lack of demand for annuity products may not be a fully rational phenomenon. Specifically, we presented survey evidence suggesting that presenting annuities and other financial products using different frames (while retaining the identical underlying financial features) can significantly alter an individual's relative preferences for these products. When alternative financial products are presented in a consumption frame, which highlights consequences for consumption over the lifecycle, annuities were strongly preferred to other types of financial products, including savings accounts. When these same product choices are presented in an investment frame, which focuses more narrowly on risk and return features, savings accounts and other financial products were strongly preferred to annuities.

This paper extends that work by examining the effects on preferences for annuities within these frames of three potential reference points: the inclusion of the annuity purchase price in the consumption frame, the variation of levels of principal protection in the investment frame, and the inclusion of initial monthly spending levels in the consumption frame.

I. Theoretical Goals

Since the development of prospect theory, economists have increasingly understood the importance of framing in economic decisions (Tversky and Kahneman, 1981). Although prospect theory itself focuses on the deviation from the uniformly rational in how individuals treat gains and losses, the more general implication driving more psychologically rich models for economic decision making is that context and framing can have a significant effect on the valuation of identical choices.

An important aspect of this theory proposes a context-dependent reference point with respect to which the notion of a gain or loss is calculated by an individual. Around this reference point the utility function of the individual is discontinuous. In understanding how someone will respond to choices that generate welfare changes, it is important to identify the individual's starting position, which in some cases is assumed to be brought to the choice by the individual, and in other cases is believed to be introduced directly by the framing of the choice.

We have designed two different frames, the "investment" and the "consumption" frames, to provide a context in which consumers might make decisions to purchase annuities. The investment frame repeatedly uses the terms "invest" and "earnings", explicitly mentions rate of return, describes the potential for early withdrawal, and characterizes the final investment value upon death for a set of different financial products, including both life annuities and savings accounts. By contrast, the consumption frame instead uses the terms "spend" and "payments," mentions only the amount of money generated each month, and keeps the underlying financial details (like rate of return) opaque to the individual.

These two alternative frames may lead to different perceptions of gains and losses. In the consumption frame, annuities appear to provide insurance against losses in monthly spending due to an elongated lifespan, while, in the investment frame, annuities appear to create the risk of losses in upfront investment money due to premature death. In this paper, we explore the possibility that individuals may also exhibit loss aversion, and that this loss aversion will manifest itself differently in the two frames.

First, we recognize that the investment frame differs from the consumption frame not only in the language used to describe the financial products, but in the direct identification of their initial purchase price, which may function as a reference point for assessing the potential for losses in the investment frame, perhaps by creating an endowment effect. Although the underlying products and the income described are identical in the consumption frame, and all products are described as being actuarially fair, this frame does not include this figure and instead mentions only an undefined "portion of their savings". In this paper we introduce this amount into the consumption frame without adding any investment language, in order to test whether this obvious investment-oriented reference point influences the observed shift in preference for annuities under the consumption frame.

Second, in our prior work we found that in the investment frame twice as many individuals prefer a principal-protected annuity that guarantees return of the nominal value of their initial investment to a savings account as prefer an actuarially equivalent life annuity without such a guarantee. This is true despite the very similar monthly payouts of a life annuity and a principal-protected annuity. This suggests that people have a strong aversion to the potential loss of their initial investment in this context. We hypothesize that preferences for annuities might be sharply inflected around this specific dollar amount, and that people may show a strong preference for products that guarantee full rather than partial return of this initial investment.

Finally, our initial experiments did not directly identify a reference point present in the consumption frame. We hypothesize that introducing a habitual monthly consumption level into the hypothetical scenarios we describe might provide people with a baseline with respect to which to calculate the gains and losses for the consumption streams provided by different financial products. By varying the initial level of monthly consumption described in the different scenarios, we can ensure that some, all, or none of the available financial choices can successfully meet these desired spending levels, and we can see how averse people are to losing some of their prior consumption.

We therefore test three variations on our initial consumption and investment frames in this paper as potential reference points: 1) introducing the initial purchase amount into the consumption frame; 2) varying the dollar amount of the guaranteed repayment in the principal-protected annuity in the investment frame; and 3) introducing a variable dollar amount of habitual monthly spending into the consumption frame.

II. Experimental Design

We collected data to test these variations from two separate internet surveys. The first four-arm survey was conducted in December 2007 and is described in an earlier paper (Brown et al. 2008); the results from two of these arms are used in this paper as comparisons. The second seven-arm internet survey was conducted in April 2008 and retains much of the same methodology. The internet survey firm Zoomerang hosted both surveys 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 673 individuals participated in the two arms of the December survey we re-consider here. A total of 3,382 individuals, approximately 483 per arm (ranging from 406 to 606), completed the April 2008 survey. Combing all arms of both surveys, participants were 43% female and 57% male, with 54% over age 60 and 34% over age 65. 75% of respondents had children, 54% were married, and 76% rated their health as "good" or better.

In all arms of both surveys 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?" The exact wording of the products and the frames used in the different arms is provided in Appendix A. All arms had a number of features in common; for example, the choices were always described in terms of amounts and durations, while specific financial terms like "annuity", "savings account", or "bond" were never introduced. Several choices were compared in all arms: (1) a life annuity paying $650 each month until death (2) a traditional savings account bearing 4 percent interest (3) a consol bond paying $400 each month forever (4) a 35-year period annuity paying $500 each month and (5) a 20-year period annuity paying $650 each month. In the arms using the investment frame, an additional choice was used: 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 until death. Respondents were told that all choices were actuarially equivalent, and this was true in almost all cases (the principal-protected annuity with varying amounts of guaranteed repayment would need to provide slightly different monthly payments to be actuarially equivalent, but this small variation was ignored).

All arms are based on either the investment or the consumption frames. Briefly, the investment frame emphasized 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 consumption frame emphasized 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. Further detail about the frames, survey design, and validity of using stated rather than revealed preferences can be found in our earlier paper and references therein (Brown et al. 2008).

III. Results

Our first reference point test introduces the $100,000 purchase price of the different financial products into the consumption frame and compares the effect on annuity preferences of this modified frame to those of our original consumption and investment frames (Table 1). We see that 68% of respondents prefer the $650 per month provided by a life annuity to the consumption stream provided by a savings account of comparable actuarial value when both products are described using the modified consumption frame, as compared with 72% when described in the original consumption frame and 21% when described in the original investment frame. Similar fractions of the respondents exposed to the modified consumption frame preferred the life annuity to receiving $650 per month for 20 years (until age 85) – 79%; the life annuity to receiving $500 per month for 35 years (until age 100) – 73%; the life annuity to receiving $400 forever (the consol bond) – 70%. In all four cases, the proportion of respondents preferring the life annuity to the alternative products was not statistically distinguishable between the original consumption and the modified consumption frames, while the proportion preferring the life annuity to the alternative products was considerably lower in the investment frame.

Since the original consumption frame and the modified consumption frame have similar effects on annuity preferences compared with the original investment frame, it does not appear that the framing effect is driven by the initial purchase price present in the investment frame. Even with this $100,000 amount present and thus providing a possible reference point for measuring gains and losses of the different financial products, the consumption-oriented language of the modified consumption frame is sufficient to shift survey respondents' preferences significantly towards the life annuity.

Our second reference point test varies the guaranteed return of the principal-protected annuity within the investment frame and examines whether the strong preference for this modified annuity observed in our previous work is tightly anchored by the initial purchase price (Table 2, columns 1-4). The original investment frame used in the December survey guaranteed repayment of the full nominal value of the principal ($100,000), while in the April survey three different guaranteed amounts were used ($80,000, $90,000, and $110,000). We find that 47 percent of respondents prefer a principal-protected life annuity earning $625 per month with the full nominal value guaranteed to the savings account, whereas only 21 percent prefer a life annuity earning $650 per month but without the guarantee. A statistically indistinguishable 46% and 44% preferred the principal-protected annuity when the repayment was reduced below the nominal value of the initial investment to $90,000 and $80,000 respectively. An increase of the guarantee above the level of the initial investment to $110,000 led to 43% preferring the principal-protected annuity a savings account.

Varying the amount of the guaranteed repayments within the range we examined has no significant effect on people's preferences for the principal-protected annuity. Still, the significant difference in the fraction of people preferring the principal-protected annuity to a savings account and the fraction preferring the life annuity in the same comparison (differences of 20 to 26 percentage points, depending on the amount of guaranteed repayment by the principal-protected annuity) suggest that individuals are averse to the potential loss of principal, albeit not with a sharply defined reference point at the purchase price.

Finally, our third reference point test introduces an initial monthly spending level into the consumption frame (Table 2, columns 5-8). The three monthly spending amounts used, $1,200, $1,500, and $1,800, were chosen to have a differential relationship to the consumption streams provided by the different available financial products (in combination with expected Social Security payments). We find that with the $1,200 monthly amount, which could be provided for by any of the products, a higher proportion (80%) of respondents prefer the life annuity to a savings account, whereas 72% prefer the life annuity when no monthly spending is mentioned. With the $1,800 monthly amount, which cannot be stably provided for by any of the financial products consumption streams, the proportion of respondents preferring the life annuity is unchanged (72%); with the $1,500 monthly amount, an intermediate proportion of respondents prefer the life annuity (75%). These differences are small, but the direction is consistent, and the 8 percentage point increase when the smallest monthly spending amount is mentioned is statistically significant. When life annuities are compared to the other financial products, the inter-arm differences are smaller and less consistent.

The absence of any large differences when the dollar amount of monthly spending targeted is varied does not suggest that this information functions as a reference point in the consumption frame. Still, within a realistic range of expected monthly spending levels for the hypothetical retirees, survey respondents consistently prefer life annuities as a financial product when presented in a consumption frame.

We used linear probability models that included the individual characteristics of survey respondents (gender, age, marital status, children, and health status) to confirm the univariate findings regarding the effects of framing and to determine whether any of these characteristics affected either the likelihood of choosing an annuity over another product or the effect of framing on this choice. In general, the multivariate models confirmed the univariate findings, and the demographic variables had no effects with one exception. In the investment frame, females had a lower preference than males for the life annuity and for the principal-protected annuity. In the consumption frame, this difference between the genders was not observed. As one would therefore expect, the estimated effect of the consumption frame relative to the investment frame was greater for females than for males. For example, in the regression-adjusted comparison between the original consumption and investment frames, females are seven percentage points less likely than males to choose the annuity in the investment frame but the effect of framing is nine percentage points larger, leading to a total adjusted consumption frame effect of 58 percentage points for females as opposed to 48 percentage points for males.

IV. Conclusion

This paper builds on our prior investigation of how framing can influence individuals' preferences for annuities by testing three specific conjectures related to reference points. Our prior work indicated that survey respondents were significantly more likely to choose an annuity in a context that emphasized spending over the lifecycle as opposed to one that emphasized risk and return over an abstract time period and, among other things, directly referenced the initial purchase price of the annuity. In this work we find that this result persists even when the initial purchase price is also mentioned in the consumption frame, confirming that the main driver of the effect is the framing language used and not the mention of the purchase price. This finding is important to establishing the practical relevance of our result, because while it would be possible to fund an annuity via incremental contributions, in the majority of cases an annuity buyer is acutely conscious of the purchase price.

In addition, our prior work indicated that individuals greatly prefer an annuity that guarantees the return of principal as opposed to an annuity in which the bulk of principal can be lost in the event of early death. In this work we find that survey respondents' preferences are not sharply inflected around the exact purchase price, since it is not particularly important for return of the full principal ($100,000) as opposed to a slightly smaller amount (e.g. $80,000) to be guaranteed. Although individuals greatly value some protection, they do not inordinately value protection of the exact amount of the initial investment, a finding that dovetails with the emergence and popularity of many new financial products that blend life-contingent payments with a variety of guarantees but not necessarily return of principal per se.

Finally, we test whether introducing a monthly spending target would lead individuals to prefer an annuity specifically because they allow the purchaser to maintain a pre-existing level of consumption for life as opposed to products that require either a drop in consumption or the risk of running out of money altogether. We did not find that preferences were sharply inflected in this way, suggesting that, when viewed in a consumption frame, annuities can be appealing to a wide range of consumers, not just those with a specific relationship between their retirement income gap and their asset balance.

While these findings did not confirm the relevance of the specific reference points tested, they are consistent with consumers having other reference points that are well-defined in their own minds; for example, consumers might care about and have an exact figure for "most of my money" in the principal protection case or "enough to live on" in the consumption frame case.

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Table 1
Percent of Respondents Preferring Annuities to Alternative Products
Comparison of Investment, Consumption and Modified Consumption Frames

	Investment Frame % (1)	***Consumption Frame*** % (2)	***Modified Consumption Frame*** ***($100,000 initial investment mentioned for each product)*** % (3)
Life annuity ($650 per month) compared to:			
Traditional savings account 4% interest	21	72	68
20-year period annuity $650 per month	48	77	79
35-year period annuity $500 per month	40	76	73
Consol bond $400 per month forever	27	71	70
N	321	352	406
Survey Arm	IB	IA	IIA

Notes:

1. *Each question described two fictitious men's decisions for investing/spending in retirement and asked, "Who has made the better choice?" All decisions were described in terms of amount and duration; the terms "annuity", "savings account", and "bond" were not used to label decisi ons.*
2. *The Investment frame(Arm IB) used terms such as "invest" and "earnings," described periods in terms of years, mentioned the value of the initial investment ($100,000 in every case), and alluded to the account value at other points in the survey. The Consumption frame (Arm IA) used terms such as "spend" and "payment," described periods in terms of the individual's age, and never alluded to an account or its value. The Modified Consumption frame (Arm IIA) is the same as the Consumption frame, with the added mention of the initial payment ($100,000 in every case) and added allusions to this account value at other points in the survey.*
3. *Standard errors range from 2.0 to 2.8 percentage points.*
4. *All survey respondents were 50 years of age or older.*
5. *Survey Arms IA and IB were collected via an internet survey in December 2007; Survey Arm IIA was collected via a separate internet survey in April 2008.*

Table 2
Percent of Respondents Preferring Annuities to Alternative Products
Introduction of Different Reference Points into Consumption and Investment Frames

	Investment Frame				*Consumption Frame*			
	$80,000 principal protection % (1)	*$90,000 principal protection* % (2)	*$100,000 principal protection* % (3)	*$110,000 principal protection* % (4)	*no monthly spending mentioned* % (5)	*$1200 monthly spending* % (6)	*$1500 monthly spending* % (7)	*$1800 monthly spending* % (8)
Life annuity ($650 per month) compared to:								
Traditional savings account 4% interest	20	24	21	22	72	80	75	72
20-year period annuity $650 per month	45	51	48	52	77	82	79	77
35-year period annuity $500 per month	43	49	40	49	76	77	74	73
Consol bond $400 per month forever	24	29	27	26	71	70	68	70
Principal-protected life annuity ($625 per month) compared to:								
Traditional savings account 4% interest	44	46	47	43				
N	606	499	321	447	352	453	440	531
Survey Arm	IIE	IIF	IB	IIG	IA	IIB	IIC	IID

Notes:

1. *Each question described two fictitious men's decisions for investing/spending in retirement and asked, "Who has made the better choice?" All decisions were described in terms of amount and duration; the terms "annuity", "savings account", and "bond" were not used to label decisions.*
2. *Arms IA and IB are described in the notes for Table 1. Arms IIE, IIF, and IIG are identical to Arm IB except for varying the guaranteed return in principal-protected life annuity as noted in the t able headings above. Arms IIB, IIC, and IID are identical to Arm IA except for the introduction of suggested monthly spending amounts as noted in the table headings above.*
3. *Standard errors range from 1.7 to 2.8 percentage points.*
4. *All survey respondents were 50 years of age or older.*
5. *Survey Arms IA and IB were collected via an internet survey in December 2007; Survey Arms IIB-IIG were collected via a separate internet survey in April 2008.*

Appendix A: Text of Survey Instrument

Investment Frame

1. *The language in bold is varied as noted in the four investment frames (Arms IIE, IIF, IA, IIG).*

Introduction

On the following screens you will be asked seven questions. In each case, two people have made permanent decisions on how to invest a portion of their money in retirement. You are asked to judge which person has made a better choice.

In all scenarios, each person has some savings and receives $1,000 each month in social security, in addition to the portion of savings mentioned in each question. Each person has chosen a different way to invest this portion ($100,000) of their savings. They have already set aside money to leave for their children when they die. The choices are intended to be financially equivalent and based on personal preferences for investing in retirement.

Life annuity

Mr. Red: Mr. Red invests $100,000 in an account which earns $650 each month for as long as he lives. He can only withdraw the earnings he receives, not the invested money. When he dies, the earnings will stop and his investment will be worth nothing.

20-year period annuity

Mr. Orange: Mr. Orange invests $100,000 in an account which earns $650 each month for 20 years. He can only withdraw the earnings he receives, not the invested money. After 20 years, the earnings will stop and his investment will be worth nothing. However, if he dies before then, he may leave remaining earnings to charity.

35-year period annuity

Mr. Blue: Mr. Blue invests $100,000 in an account which earns $500 each month for 35 years. He can only withdraw the earnings he receives, not the invested money. After 35 years, the earnings will stop and his investment will be worth nothing. However, if he dies before then, he may leave remaining earnings to charity.

Consol bond

Mr. Green: Mr. Green invests $100,000 in an account which earns a 5% interest rate. He can only withdraw the interest he receives, not the invested money. When he dies, he may leave the remaining earnings, which continue forever, to charity.

Savings account

Mr. Gray: Mr. Gray invests $100,000 in an account which earns a 4% interest rate. He can withdraw some or all of the invested money at any time. When he dies, he may leave any remaining money to charity.

Principal-protected life annuity

Mr. Black: Mr. Black invests $100,000 in an account which earns $625 each month for as long as he lives. He can only withdraw the earnings he receives, not the invested money. If he dies before he has received **$80,000 (or $90,000/$100,000/110,000)** in total payments, he may leave the difference to charity.

Consumption Frame

1. **The language in bold is only present in the modified consumption frame (Arm IIA).**
2. *The language in italics is only present and is varied as noted in the three consumption frames with monthly spending levels (Arms IIB, IIC, IID).*

Introduction

On the following screens you will be asked seven questions. In each case, two people have made permanent decisions on how to spend a portion of their money in retirement. You are asked to judge which person has made a better choice.

In all scenarios, each person has some savings and can spend $1,000 each month from social security in addition to the portion of income mentioned in each question. *They are used to spending about $1,200 (or $1,500 / $1,800) each month before retirement.* **Each person has chosen a different financial product for a portion ($100,000) of their savings.** They have already set aside money to leave for their children when they die. The choices are intended to be financially equivalent and based on personal preferences for spending in retirement.

Life annuity

Mr. Red: Mr. Red **pays $100,000 at retirement so he** can spend $650 each month for as long as he lives in addition to social security. When he dies, there will be no more payments.

20-year period annuity

Mr. Orange: Mr. Orange **pays $100,000 at retirement so he** can spend $650 each month until he is 85 years old in addition to social security. When he turns 85, he will have no additional money left to spend. However, if he dies before he is 85, he may leave remaining payments to his children.

35-year period annuity

Mr. Blue: Mr. Blue **pays $100,000 at retirement so he** can spend $500 each month until he is 100 years old in addition to social security. When he turns 100, he will have no additional money left to spend. However, if he dies before he is 100, he may leave remaining payments to his children.

Consol bond

Mr. Green: Mr. Green **pays $100,000 at retirement so he** can spend $400 each month for as long as he lives in addition to social security. When he dies, he may leave remaining payments, which will continue forever, to his children.

Savings account

Mr. Gray: Mr. Gray **pays $100,000 at retirement so he** can choose an amount to spend each month in addition to social security. How long his money lasts depends on how much he spends. If he spends only $400 per month, he has money for as long as he lives. When he dies, he may leave the remainder to his children. If he spends $650 per month, he has money only until age 85. He can spend down faster or slower than each of these options.

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