What Matters for Annuity Demand: Objective Life Expectancy or Subjective Survival Pessimism?

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Introduction

Motivation

- Individuals are pessimistic about their survival when they make irreversible annuitization decisions.
  - A standard life-cycle model predicts that this should be quantitatively important (O'Dea and Sturrock 2023).

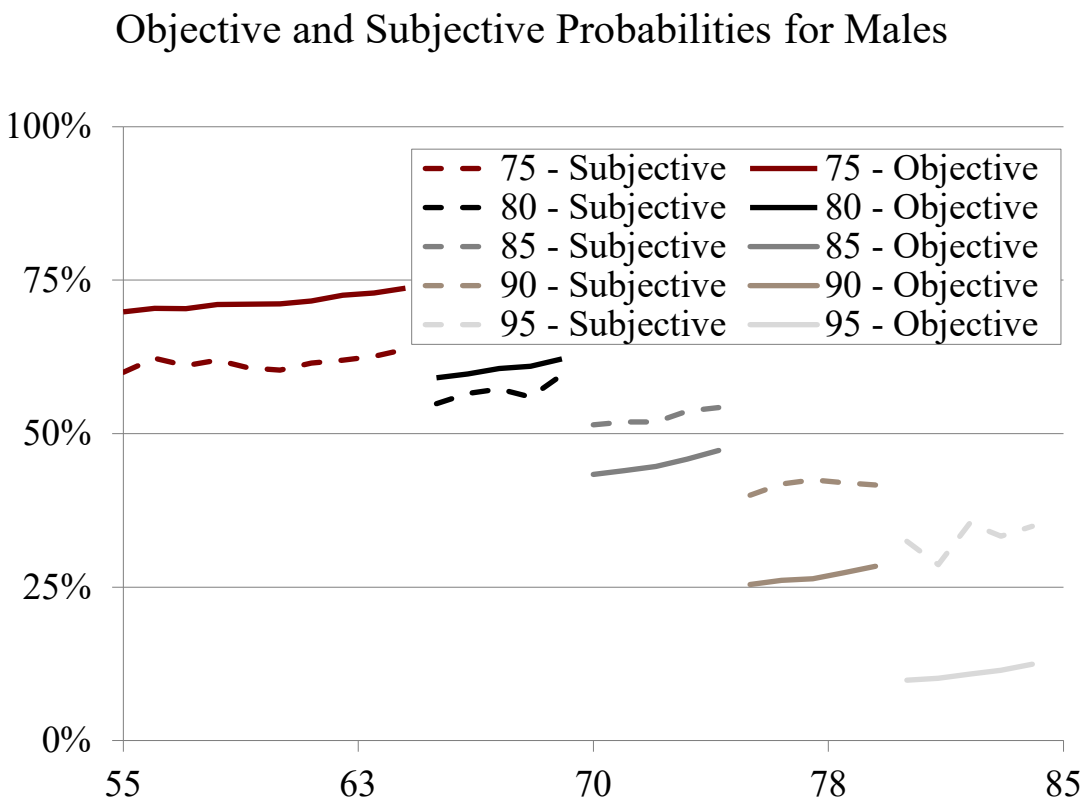
- Question:
  - Can we find empirical evidence that survival pessimism affects annuitization?

Data

- *Health and Retirement Study* (HRS)
  - We use subjective mortality questions to calculate subjective life expectancy
  - Focus on ages 55 to 64
  - In total 32,179 person/year observations

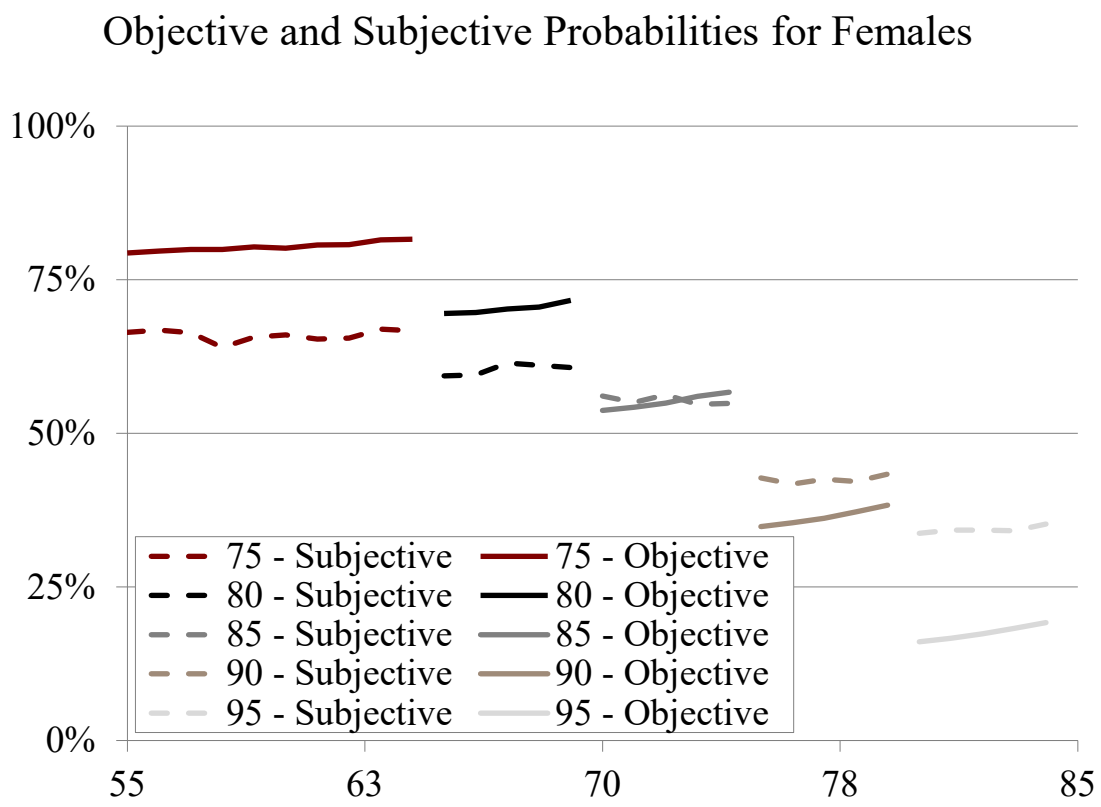
- NVSS + ACS + 2020 Social Security Trustees Report (Wettstein et al. 2021)
  - Objective life expectancies
    - based on gender, cohort, race, education

Subjective mortality is higher than objective before age 70.



Source: Authors' calculations using the *Health and Retirement Study* (HRS) (2000-2016).

This pattern is similar for females.



Source: Authors' calculations using the HRS (2000-2016).

Methods

The HRS asks respondents their subjective mortality probabilities.

- The expectations module of the HRS asks participants:
  - "What is the percent chance that you will live to be age [X] or more?"

- Everyone in our sample answers two questions per wave
  - We assume that they answer a third question (age 110) according to the life tables
  - In total we have three answers: $R_i(\alpha, \mathrm{t})$, for $\alpha \in \{\alpha_1, \alpha_2, \alpha_3\}$

Given subjective survival to three ages, a curve is fitted.

- We assume that subjective survival curves follow a two parameter Weibull distribution:

$$S(a, \lambda_i, \kappa_i) = exp[-(\frac{a - z_i}{\lambda_i})^{\kappa_i}], \qquad \lambda_i, \kappa_i > 0$$

- We estimate the curves for every individual using NLS, and calculate the subjective life expectancy:

$$(\hat{\lambda}_i, \hat{\kappa}_i) = \underset{\lambda_i, \kappa_i}{argmin} \sum_{a \in A_i} \left(R_i(a, z_i) - S(a, \lambda_i, \kappa_i)\right)^2$$

Objective vs. subjective life expectancy

Objective and Subjective Life Expectancies in the HRS

		Everyone	
		Objective	Subjective
Ages 55-59	Total	26.0	24.4
	High education	28.2	26.3
	Low education	24.1	22.1
	White	25.9	24.5
	Black	24.0	25.9
Ages 60-65	Total	21.1	19.9
	High education	22.9	21.5
	Low education	19.7	18.1
	White	20.9	20.0
	Black	19.7	21.3

Source: Author's estimates from the HRS (2000-2016).

Regressions link subjective and objective survival to annuitization rates.

- We estimate equations of the form:

$$A_{i,t} = \beta_0 + \beta_1 * LE_{i,t}^{obj} + \beta_2 * (LE_{i,t}^{obj} - LE_{i,t}^{subj}) + \boldsymbol{\beta}_3 * \boldsymbol{X_{i,t}} + \varepsilon_{i,t}$$

- $A_{i,t}$ is an indicator for annuity income
- $LE_{i,t}^{obj}$ and $LE_{i,t}^{subj}$ are objective and subjective life expectancy
- Subjective survival pessimism is: $LE_{i,t}^{obj}$ - $LE_{i,t}^{subj}$
- $\boldsymbol{X_{i,t}}$ is a vector of controls

Results

Regression Results for the Effect of Life Expectancy and Pessimism on Owning a Commercial Annuity

	(1)	(2)	(3)
Variables	Short	Intermediate	Main
Objective LE	0.00204***	0.00193**	0.00128*
	(0.000760)	(0.000784)	(0.000725)
Pessimism	-0.000233*	-0.000259*	-0.000224*
	(0.000130)	(0.000133)	(0.000129)
Male	0.000951	0.00109	-0.00230
Health controls	No	Yes	Yes
Wealth & family controls	No	No	Yes

Source: Author's estimates from the HRS (2000-2016).

Alternative regressions

- We also consider:
  - $A_{i,t}$: Share of Wealth annuitized
  - $A_{i,t}$: Share of Income from an annuity
  - Including individual fixed-effects
  - Controlling for planning horizon
  - Controlling for financial literacy

- Results are similar.
  - β_2 <0.1% (coefficient of subjective survival pessimism)

Conclusion

- We assess whether survival pessimism affects annuitization
- We find a small effect (0.1 p.p. / per year reduction)
- Objective life expectancy coefficient is over 5 times larger
- This result is robust to alternative specifications
- Study is descriptive / annuitization is irreversible

Thanks!