

DEFINED CONTRIBUTION PENSIONS, RETIREMENT INCOME UNCERTAINTY, AND PRECAUTIONARY SAVINGS

Victoria Gregory (St. Louis Fed)

with Andrew Caplin, Eungik Lee, Søren Leth-Petersen, Johan Sæverud

September 11-12, 2020

Sloan-Nomis Conference on Attention and Applied Economics

Disclaimer: The views expressed herein are solely those of the author and do not necessarily reflect those of the Federal Reserve Bank of St. Louis or the Federal Reserve System.

CAUSES AND EFFECTS OF RETIREMENT INCOME UNCERTAINTY

Main focus: risk and uncertainty in **retirement** income

- Understudied relative to labor income – past work usually assumes it is certain
- Combination of income from **defined-contribution (DC) accounts**, pension schemes, social security
- DC accounts becoming more popular around the world (Denmark: started early 90's)

How much risk do people perceive and what characteristics is it related to?

- We design and field new survey to elicit subjective expectations and uncertainty
- Combine with administrative data on wealth and income

How does this uncertainty connect with life-cycle savings motives?

- Use structural model to quantify effects of each form of uncertainty associated with DC accounts

Copenhagen Life Panel (CLP)

- Large-scale survey of random sample of Danish population
- Designed in late 2019; first year of data was collected in January - February 2020
- Collected information on expectations (Dominitz & Manski 1997) and uncertainty
 - Future labor income
 - Amount of wealth in pension accounts
 - Annual income provided by pension wealth
 - Retirement age
 - and more...

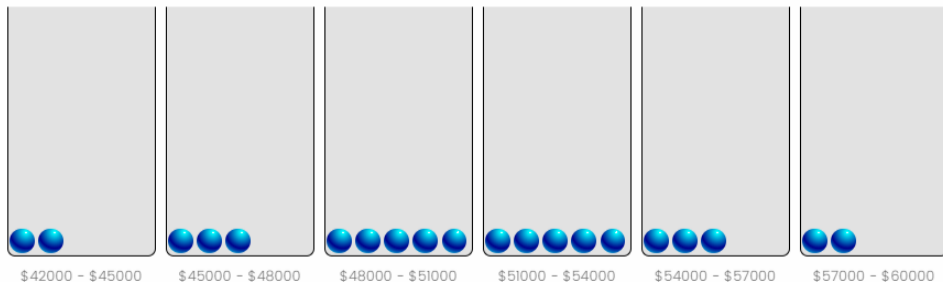
Ongoing work: link respondents to **Danish Register** data

- Administrative records on income, employment, and wealth history

BINS AND BALLS

Can characterize entire subjective probability distribution using bins and balls method of Delavande and Rohwedder (2008)

“Suppose your future pension savings evolve as you expect. If you were to convert all this wealth into a steady income stream (life-long pension) at the age of [retirement age], how much annual income do you believe it would provide?”



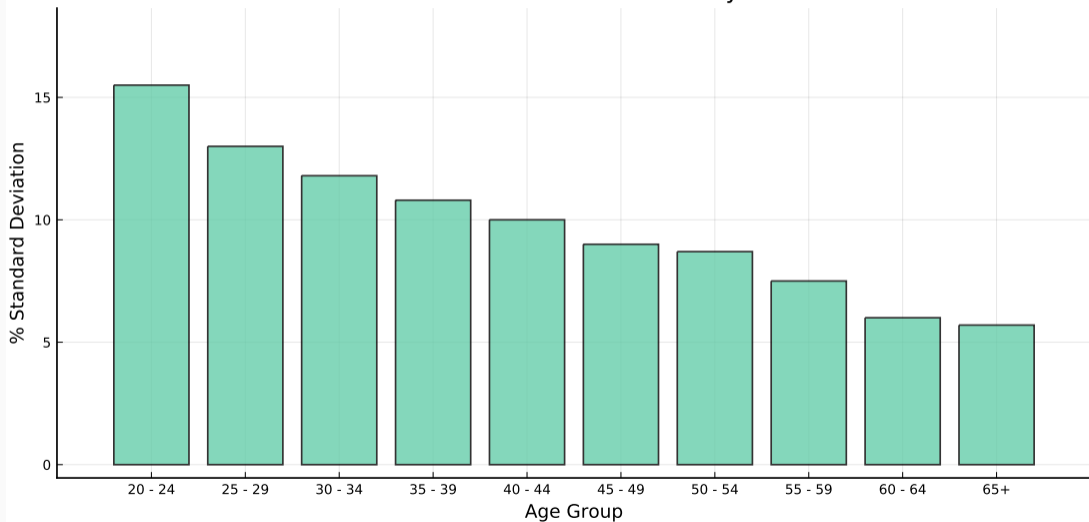
Measuring retirement income **uncertainty**:

- Go beyond just point estimates of expectations
- Outcome of interest: % standard deviation of retirement income distribution
- Correlate with other variables collected in the survey like age, income, employment status, retirement age uncertainty,...

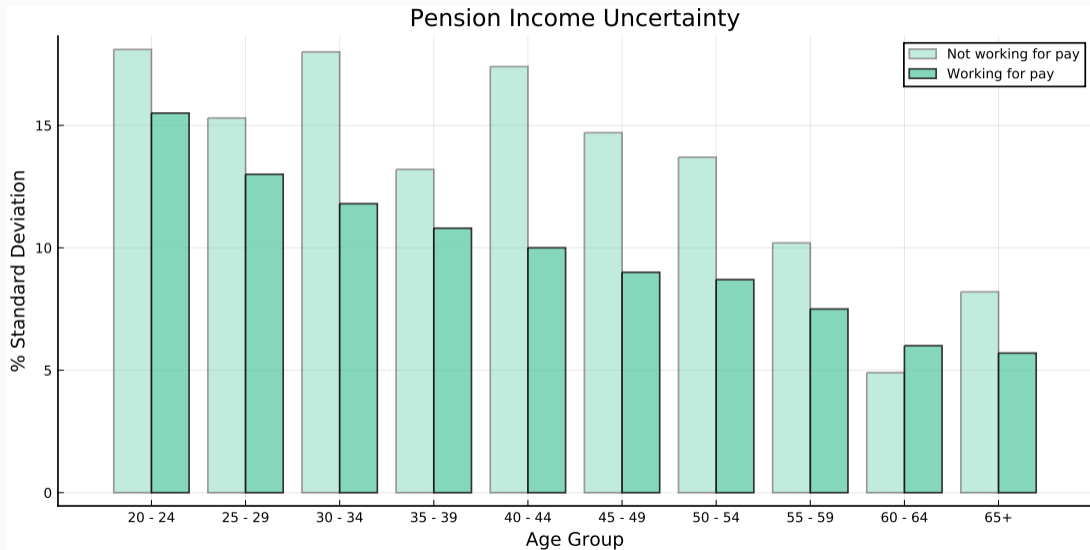
Where does this uncertainty come from?

- Contribution risk: path of future income is unknown
- Lots of different paths when young
- We should see uncertainty decline with age

Pension Income Uncertainty



UNCERTAINTY, AGE, AND EMPLOYMENT



SURVEY FINDINGS SO FAR

	All	All	All	Working for pay
age	-0.314*** (0.071)	-0.314*** (0.071)	-0.132* (0.075)	-0.362*** (0.090)
age ²	0.001 (0.001)	0.001 (0.001)	-0.000 (0.001)	0.003** (0.001)
female	0.521** (0.229)	0.520** (0.229)	0.539** (0.224)	0.512** (0.227)
income		0.001 (0.001)	0.002 (0.001)	0.002 (0.001)
not working for pay			3.374*** (0.443)	
retirement age uncertainty			0.226*** (0.043)	0.174*** (0.038)
Pr(retire in 2025)				-0.019*** (0.005)
Pr(job loss 2020)				0.010* (0.005)
constant	21.774*** (1.488)	21.777*** (1.488)	15.048*** (1.690)	19.498*** (1.931)
Number of obs.	9853	9853	9853	8439

MODEL: ENVIRONMENT

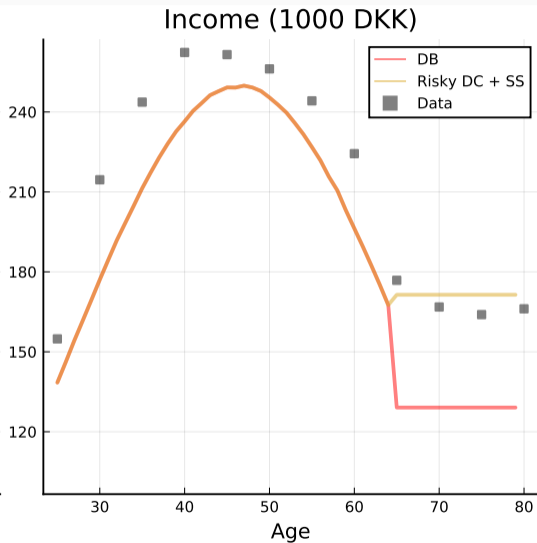
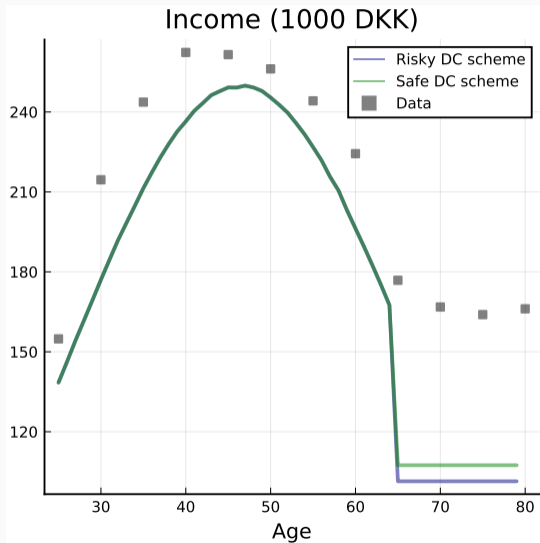
- Embed DC account into partial-equilibrium life-cycle consumption/savings model
- Enter the labor market at 25, retire at 65, live until 80
- Risky labor income: permanent and transitory components
- Contribute 8% of income each period to DC account
- Sources of retirement income risk
 1. Labor income contributions
 2. Risky rate of return on DC account
- Each period, choose consumption and investment in risk-free asset
- Upon retirement, the wealth in DC account is used to purchase an annuity that pays a fixed amount in each year of retirement (to do: uncertainty in annuity formula)

4 SCENARIOS

Compare different environments that affect retirement income risk

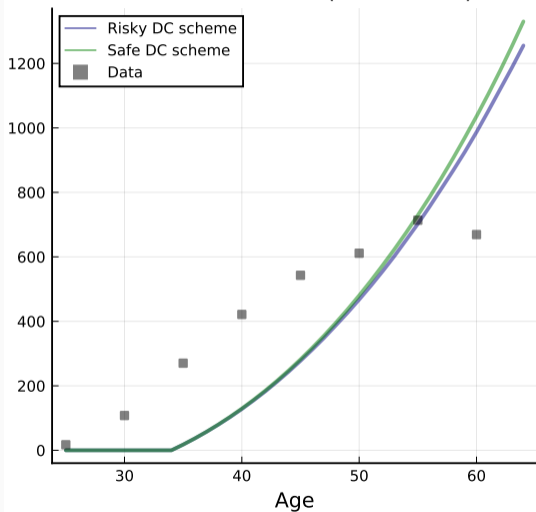
1. **Risky DC account:** model in previous slide
2. **Safe DC account:** remove risk in rate of return (keep labor income risk)
3. **DB account:** workers pay a tax that allows the government to fund a DB scheme where all workers receive 8% of *average* income each year
4. **Risky DC + social security (realistic):** same as 1, but now the government collects taxes to fund a guaranteed DKK 70K per year social security income

CALIBRATION: INCOME

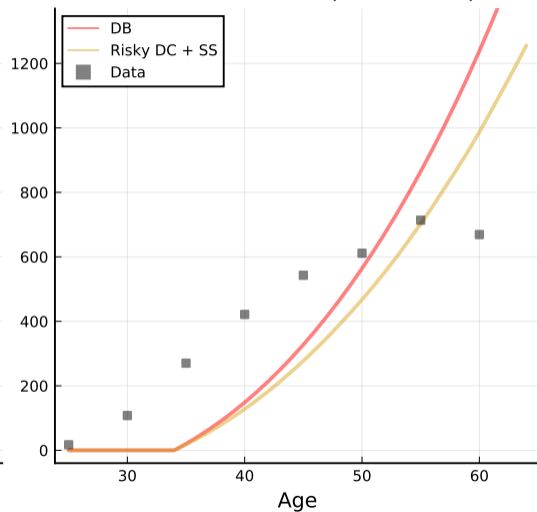


CALIBRATION: PENSION WEALTH

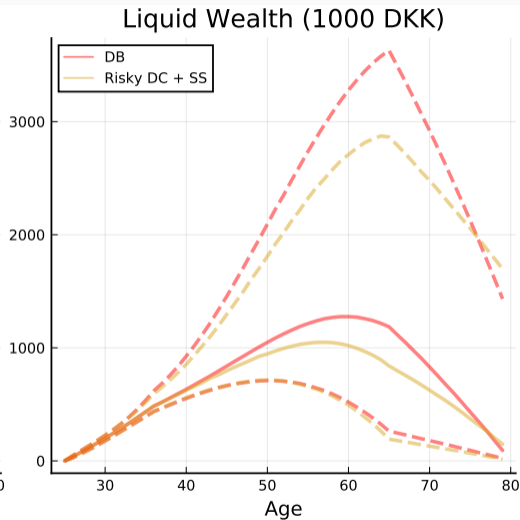
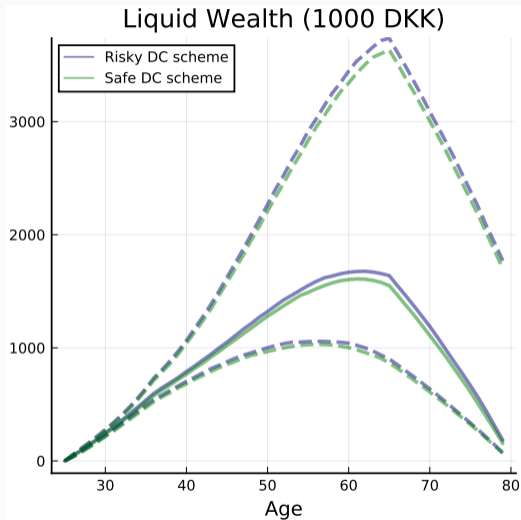
Pension Wealth (1000 DKK)



Pension Wealth (1000 DKK)

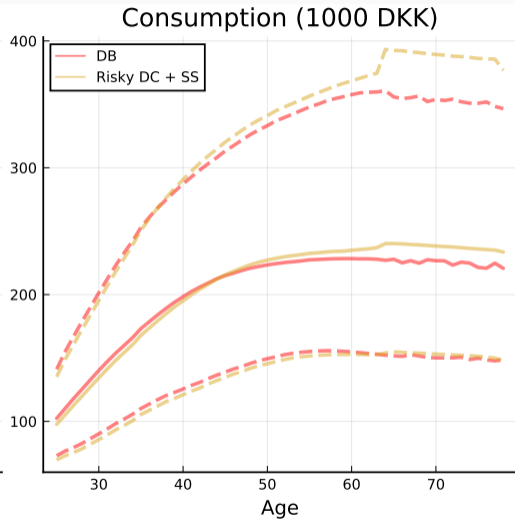
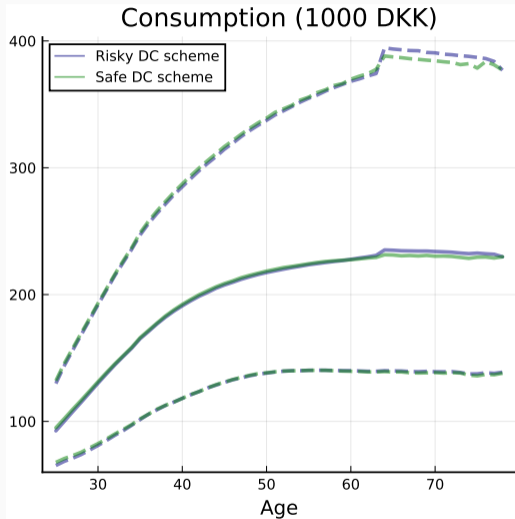


LIQUID WEALTH



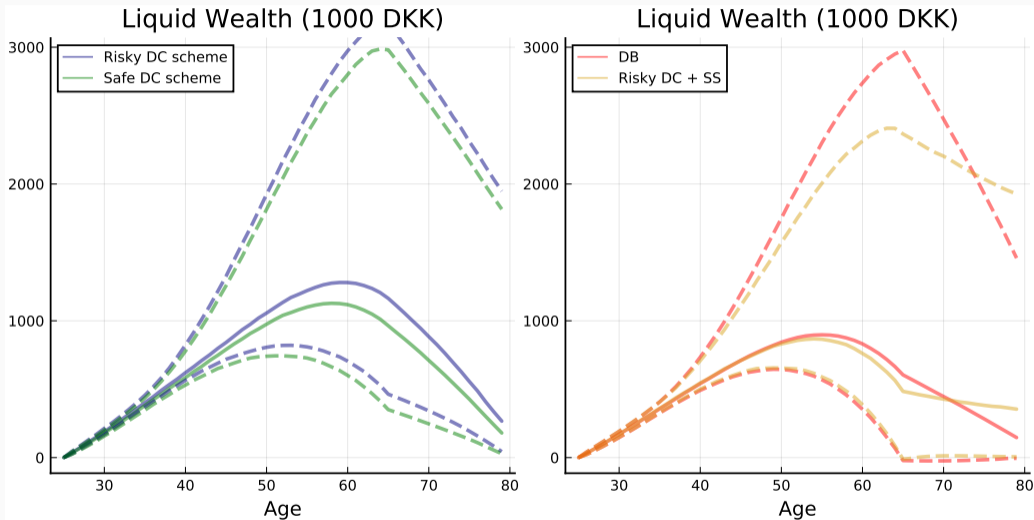
“Oversaving” when DC + SS are available → less need for liquid wealth.

CONSUMPTION



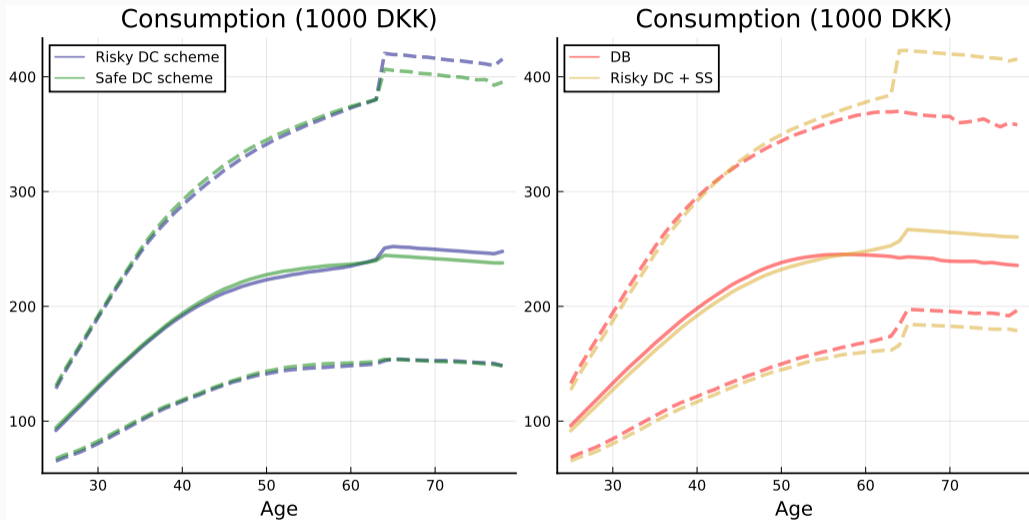
After all uncertainty is resolved, some end up with more wealth than anticipated.

LIQUID WEALTH: DC SYSTEM FULLY PHASED IN



Longer time invested in DC → larger role for investment return risk.

CONSUMPTION: DC SYSTEM FULLY PHASED IN



Oversaving now more prevalent across the distribution.

Using the survey as a new approach to identification. Ideas:

- Subjective income uncertainty
 - Pension income uncertainty → permanent component
 - Labor income uncertainty → transitory component
- New Strategic Survey Questions (SSQs) in 2021
 - Ask about WTP for entering policy environments simulated in the model
 - Informative about risk aversion, perceived income and returns risk
 - Imperfect understanding of annuity formula: SSQs are well poised to measure this
- Improves identification, brings in new info (especially on annuity formula), validates/invalidates implications of standard models