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10-12 Novembre 2021

Longevity and Financial-Risk Taking

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Context and motivation



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Retirement income  → financial well-being in old age.

Key decisions for retirement planning:

investment and saving choices

annuitization

(accumulation phase) ↗

(retirement phase)

Individuals' decision-making is crucial within funded pension arrangements.



The **better** people's decisions, the **higher** their financial well-being,
the **lower** the risk to outlive their assets.



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Standard life-cycle models:

fully rational individuals solve optimization problems
to obtain smooth consumption.

Empirical evidence:

- many individuals fail to achieve the retirement saving goals predicted by conventional economic models;
- women aged 65+ receive, on average, 26% less income than men from the pension system in the OECD countries (“gender pension gap”)*.

**Beyond labour market determinants and financial literacy, attitudes and beliefs play a role.*



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Research question 1:

what are the causes of sub-optimal choices?

- **A focus on longevity and financial risk tolerance.**



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Our starting point.



The relevant economic choices for retirement planning depend on
financial risk tolerance.

Understanding financial
risk tolerance



understanding observed
retirement behaviour.



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Financial risk tolerance: well-established empirical findings.

Financial risk tolerance is heterogeneous.

It:

- depends on static factors, as biological, socio-economic and environmental variables;
- depends on transient states, such as mood;
- is generally higher for males than for females;



is affected by horizon length (i. e. it increases with **life expectancy**).



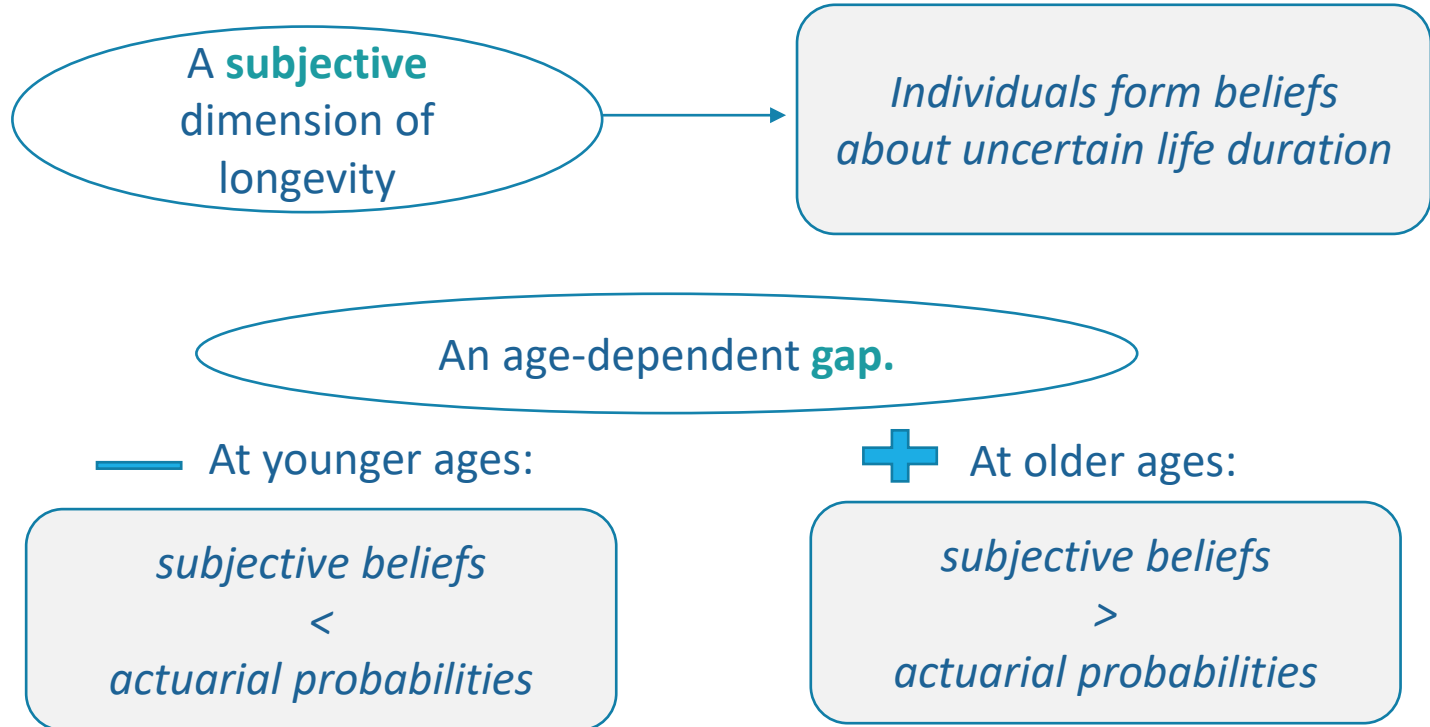
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Longevity forecasts: subjective vs objective.



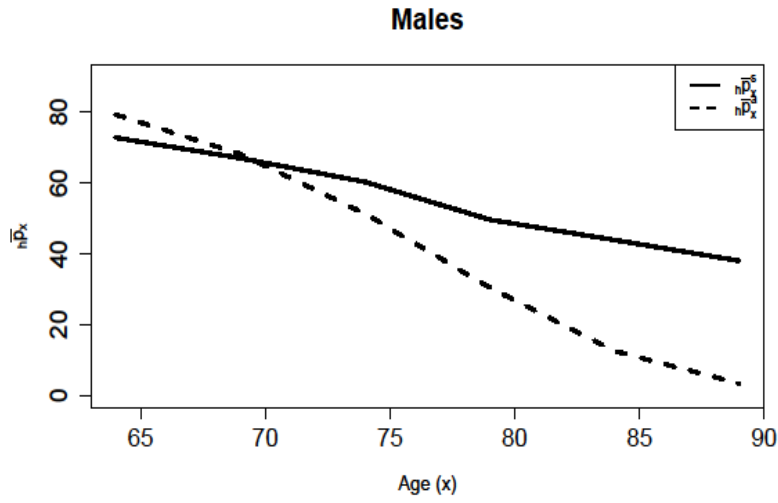
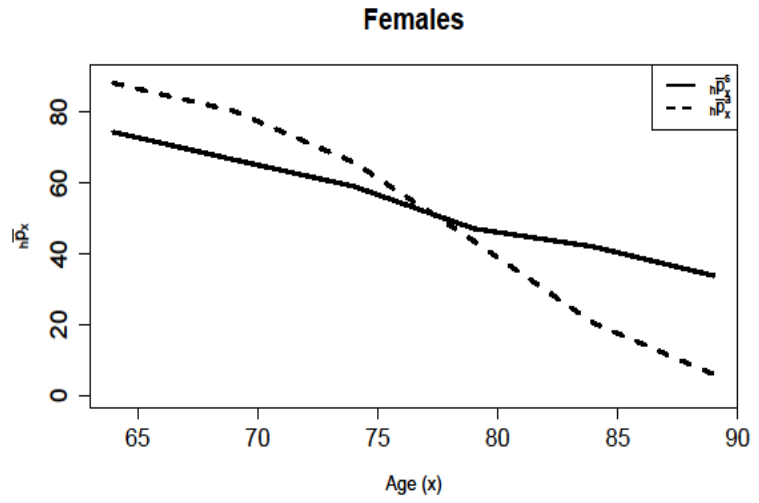


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- Data from “The Survey of Health, Ageing and Retirement in Europe” (SHARE);
- all individuals forecast survival over the next 11 years;
- **actuarial probabilities**: dashed line; **subjective probabilities**: solid line.

Subjective survival probabilities decrease more slowly as a function of age!



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Why is there a survival gap? The state-of-the-art

Behavioural explanations are prominent in the literature.

- ! The **updating** of subjective beliefs violates the rational Bayesian learning paradigm.

Psychological mechanisms guide the interpretation of new information

(e.g. cognitive weakness (Grevenbrock et al. 2021)).



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The survival gap: our behavioural/actuarial approach

A behavioural model of sentiment (theory):



An econometric/actuarial validation (empirical findings):

- Sentiment is the main driver of the updating of subjective survival beliefs;
- compared to health-specific actuarial probabilities, subjective probabilities decrease much less in response to health shocks.



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Research question 2:

how do biased subjective survival beliefs impact on financial risk tolerance?

- **An empirical investigation to assess their relationship.**



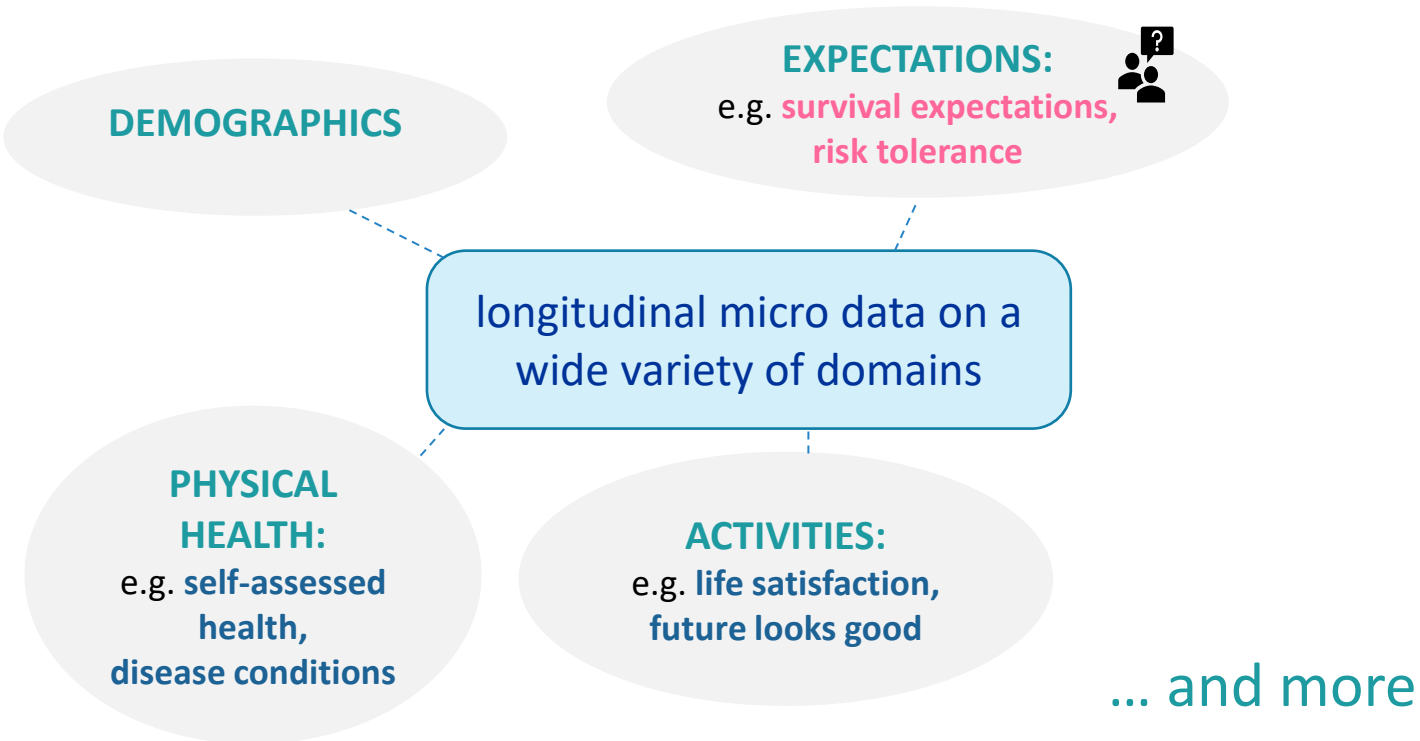
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Data from SHARE (2004-2020)





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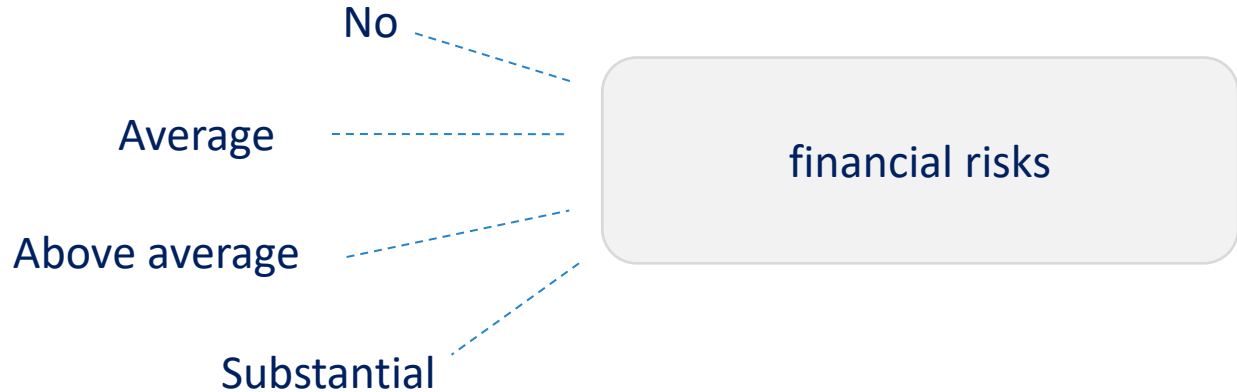
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Risk tolerance

People are asked about the **amount of financial risk** they are willing to take when they save or make investments.





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Subjective survival beliefs

People are asked about the **chance to survive** a given target age.

Age x	Target age
$50 \leq x \leq 65$	75
$66 \leq x \leq 69$	80
$70 \leq x \leq 74$	85
$75 \leq x \leq 79$	90
$80 \leq x \leq 84$	95
$85 \leq x \leq 90$	100



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Actuarial survival probabilities

- (1) Basic mortality forecasts** from the CBD model (*based on age, gender and country*);
- (2) mortality adjustment factors γ** for specific health classes (*life tables based on SHARE data. Methodology similar to the actuarial practice in the field of risk classification in life insurance*).

Preferred risks ($\gamma < 0$)	Standard risks	Substandard risks ($\gamma > 0$)
Healthy	SHARE total population	One severe disease (e.g. cancer, diabetes, heart attack)
High Blood Pressure		at least two diseases
Long-Term Disease		

Outcome: health-specific actuarial survival probabilities.



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Our measure of the «survival gap».

Subjective survival probability – *health-specific actuarial probability.*

What is new?



The objective benchmark for subjective beliefs incorporates more private information (health status).

Advantages:

We better explain objective mortality heterogeneity among respondents.

The gap better captures the bias in subjective beliefs.



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Empirical methodology: regression analysis.

Target variable: probability to be financial risk-taker (i.e. to accept at least some level of financial risk).

Explanatory variables.

they pertain to the following individuals' characteristics:

demographics, employment, wealth, education, physical health, cognitive functions (e.g. numeracy), behavioural risks, sentiment, survival gap.

Countries under study: Austria, Belgium, Denmark, France, Italy, Sweden and Switzerland.



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The profile of the financial risk-takers (some findings).

They:

- express a **more precise** estimation of their survival prospects (i.e. survival gap in the range $(-8.30\%, 5.94\%]$)*.
- are more optimistic;
- assign higher ratings to their health status;
- have higher amounts of net worth;
- are males;
- show understanding of the notion of compound interest;
- live in Denmark or Sweden;
- are interviewed after the global financial crisis of 2007-2009.

**For these individuals, the odds of being financial risk-takers are up to 6% higher than for the other respondents, in our analysis.*



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Conclusions

- *A standard economic and actuarial perspective:*
longevity affects consumption and the demand for pensions, insurance products and annuities.
- *A behavioural perspective:*
longevity **misperception** can induce individuals to take sub-optimal choices, undermining their financial well-being.
- *The next steps in the research process:*
 1. the construction of a **choice architecture** to nudge people towards better choices;
 2. the design of more **attractive insurance products**, accounting for biases.