THE INCREASING LONGEVITY GAP AND THE PENSION SYSTEM

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18.01.2017
Table of Contents

1. Introduction
2. Data and institutional background
3. Methodology
4. Preliminary results
5. Conclusion
# Table of Contents

1. Introduction

2. Data and institutional background

3. Methodology

4. Preliminary results

5. Conclusion
Contributions

- **Analyze evolution of differential mortality** by lifetime earnings across cohorts 1903-1947 in Germany
  - Use acquired pension entitlements as proxy for lifetime earnings to form deciles (for men)

- **Decompose gap increase:** (1) inequality change and (2) change of differential mortality gradient (e.g. behavioral changes)

- **Show distributional implications** for the pension system

- To do: differentiate by health status and identify profiteers of survivor pensions
Negative correlation of socio-economic status and mortality:

- Relationship known for a long time
  - Antonovski, 1968

- Documented for all causes of death
  - Feinstein, 1993

- Documented internationally e.g. USA, GB, Scandinavia or Italy
  - Mackenbach et al., 2003 and Feinstein, 1993

- Documented for Germany
  - Gaudecker and Scholz, 2007
**Income** linked to drivers (Cutler et al., 2006; Lleras-Muney, 2005):

- **Selection**: better career options for healthy individuals
  - Macintyre, 1986

- **Conditions**: better working and living conditions, better access to healthcare and food
  - Klein, 1999; Klein, Unger, 2001

- **Behavior**: positively correlated with education and a healthy behavior
Importance of income is likely to rise:

- Cross-sectional earnings inequality for most advanced economies in the last 3 decades
  - Atkinson, Piketty, 2010; Autor et al., 2006; Card, DiNardo, 2002; Goos et al., 2009; Lemieux, 2007

- Lifetime earnings inequality
  - Kopczuk, Saez, Song, 2010: US; Bönke, Corneo, Lüthen, 2015: Germany

- Earnings related lifetime gap
  - Chetty et al., 2016: difference in LE at age 40 in US is 14 years between highest and lowest percentile and increased between 2001 and 2014
Heterogeneous mortality and distributional effects of pension system:

- **Regressive component**: insurance against longevity; pensions paid until death, high income earners live longer and have higher pensions

- **Progressive component**: insurance against disabilities by giving individuals who are unable to work access to special pensions
Table of Contents

1. Introduction

2. Data and institutional background

3. Methodology

4. Preliminary results

5. Conclusion
Data (preliminary)

Data to estimate mortality differences:

- Dataset 1: stock of pensions, 1992-2012, 1% sample (1.5 Mio Men West)
- Dataset 2: cessation of pensions, 1993-2013, 10% sample (0.5 Mio Men West)

Data to estimate the distribution of pension wealth and the pension system’s generosity (internal rates of return):

- Dataset 3: VSKT, biography data from the pension insurance (3000 Men West); includes monthly contributions from ages 14 to 66 and pension prospects
Mandatory insurance for employees; Bismarckian system: pensions strongly linked to prior contributions

Pension level based on earnings points (EP); 1 EP is given for average contributions in a year; worth about €30 in 2016

Other factors: type of pension, retirement age (early retirees get disincentives)

Special pensions depending on retirees individual situation (e.g. disabled, unemployment, women, long-term insured)
Table of Contents

1 Introduction

2 Data and institutional background

3 Methodology

4 Preliminary results

5 Conclusion
Estimating mortality

- Logit-Model:

\[
\text{Prob}(\text{death}_{itcd}) = \Lambda \left( \beta_0 + \sum_{p=1}^{4} \beta_p t^p + \eta_c + \mu_d + \nu_{cd} \right)
\]

- Cohorts grouped into 5-year cohorts; EP into deciles
- Mortality rates predicted for a grid of age × cohort group × earnings point decile
- Age range: 65-99
Disentangle distributional changes from gradient changes:

- Gradient estimation: fixed EP-categories for all cohorts
- Distributional effect estimation: re-weight estimation results based on empirical distribution of EP
- Difference between re-weighted and first results: distributional change
Aim: calculate pension wealth, contributions and generosity

NPVs of pensions and contributions in 2015 real values for both average and heterogeneous mortality

Generosity: internal rates of return (to be done)
Table of Contents

1. Introduction
2. Data and institutional background
3. Methodology
4. Preliminary results
5. Conclusion
Increasing differential mortality
Life expectancy by EP-decile, median cohort 1945

Increasing differential mortality

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Pension wealth, heterogenous mortality

Cohort

Euro, 2015 real values

1935
1940
1945
1948

1 2 3 4 5 6 7 8 9 10

Increasing differential mortality
Pension wealth, difference het/avg

Euro, 2015 real values

Cohort

1935 1940 1945 1948

0 50,000 100,000

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18.01.2017 20 / 25
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18.01.2017 21 / 25

Difference between pensions and contributions

Euro in 2015 real values

Cohort

1935 1940 1945 1948

Difference between pensions and contributions

0 100000 200000 300000

1 2 3 4 5 6 7 8 9 10
Ratio pensions/contributions, het. mort.

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Increasing differential mortality
Increasing differential mortality
1. Introduction

2. Data and institutional background

3. Methodology

4. Preliminary results

5. Conclusion
Life expectancy is growing in Germany, especially in upper deciles.

Main reason: gradient increase (e.g. rich people smoke less)

Regressive effect, but overall pension system still not regressive: insurance against disability / unemployment (lower deciles) and longevity (higher deciles)

Returns expected to become somewhat u-shaped; at some point in the distribution: longevity dominates disability insurance

Outlook: increasing longevity gap, disincentives for early retirees, early path for stable earners and abolishment of unemployment / women paths make pension system more regressive.