Lifetime Income Inequality: quantile treatment effect of retirement on the distribution of lifetime income.

Małgorzata Karolina Kozłowska

University of Rome "Tor Vergata"

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Life cycle, social security and inequality

- Human Capital Earnings Function (HCEF)
  - Fanning out of earnings profiles across education groups as the cohort ages.
- Permanent Income Hypothesis (PIH)
  - Within cohort inequality evolves over life-cycle, reaching the highest levels in the old age.
  - Disparities in earnings between groups with different schooling levels grow in retirement age.
  - Reducing the share of income that is transferred through Social Security Systems increases life cycle inequality.
- Social Welfare Theory (SW)
  - By Pigou-Dalton Principal of Transfers any (mean-preserving) progressive transfer decreases inequality.

What this study proposes

- Evaluate the effect of postponing retirement on income inequality through estimating the causal effect of staying longer in labor force on lifetime income distribution.

Research questions

- What is the impact of staying longer in labor force on distribution of lifetime income ?
- What is the impact of postponing retirement age on lifetime income inequality ?

Survey of Health Aging and Retirement

- Multidisciplinary cross-country longitudinal survey that collects micro data on individuals aged 50+.
- The data used in this study consists of two regular panel waves followed by the life history questionnaire of which the data were collected accordingly in 2004-2005, 2006-2007 and 2008-2009.
- This study covers 10 European countries: Austria, Germany, Sweden, The Netherlands, Spain, Italy, France, Denmark, Switzerland, Belgium.
- Main advantages of using SHARE
  - Its crossnational and multidisciplinary dimension.
  - Inclusion of retrospective statements about socio-economic status spanning lifetime, allowing deriving lifetime income measure.

Lifetime income

- Lifetime income for individuals who are retired at the moment of the interview is represented by the formula:

$$Y_i = \sum_{j=1}^{R_i} \omega_j W_{ij} + \sum_{R_i+1}^{110} s_{j+1} \omega_j P_{ij}$$

where:

Y_i - total lifetime income

W_{ij} - lifetime earnings from work at age j

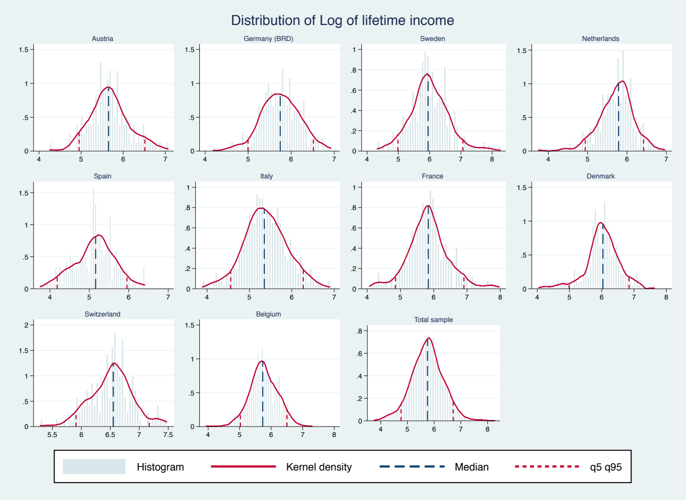
P_{ij} - lifetime retirement pension at age j

R_i - retirement age

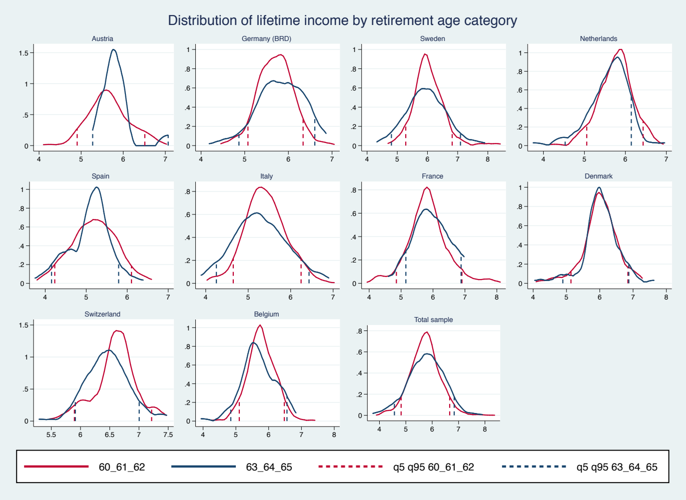
s_{j+1} - probability of surviving to age j+1, predicted based on Lee-Carter model

ω_j - discount rate (2% to age 50)

Kernel density estimates



Kernel density estimates by retirement age



Model specification

Specification of the model in a cross-country setting:

$$Y_i = \alpha_0 + \alpha_1 R_i + \beta^\top X + \varepsilon_i$$

$$Q_\tau(Y_i) = \alpha_{0\tau} + \alpha_{1\tau} R_i + \beta_\tau^\top X_i$$

where:

Y_i - personal lifetime income

R_i - binary indicator taking value 1 if an individual retired exactly at age 63 or later, and 0 if an individual retired by age 62

X - set of country dummies.

Estimation and identification

- Issues : Endogenity
- Identification: Quantile Instrumental Variables techniques
    - Abadie, Angrist & Imbens (2002)
    - Chernozukov & Hansen (2005)
- Instruments: legislated early and normal retirement ages differenced with age:

$$\begin{cases} \text{Z=1}, & \text{if } \text{A}_i - leg_{ER} \geq 0 \\ \text{Z=0}, & \text{if } \text{A}_i - leg_{ER} < 0 \end{cases}$$

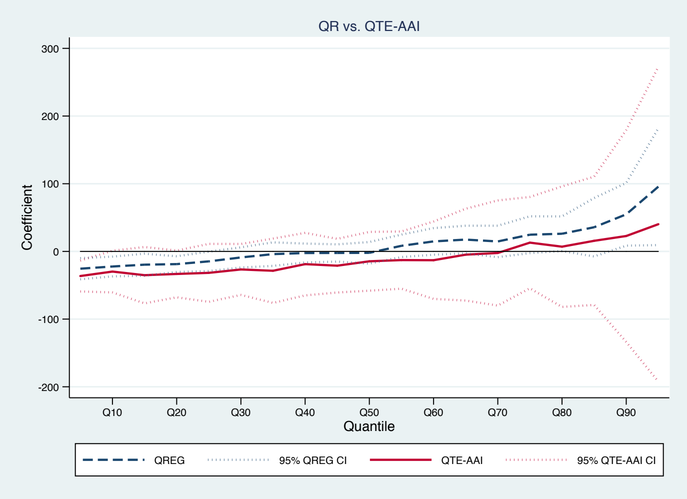
where:

A_i is the actual age of an individual in the year of the interview,

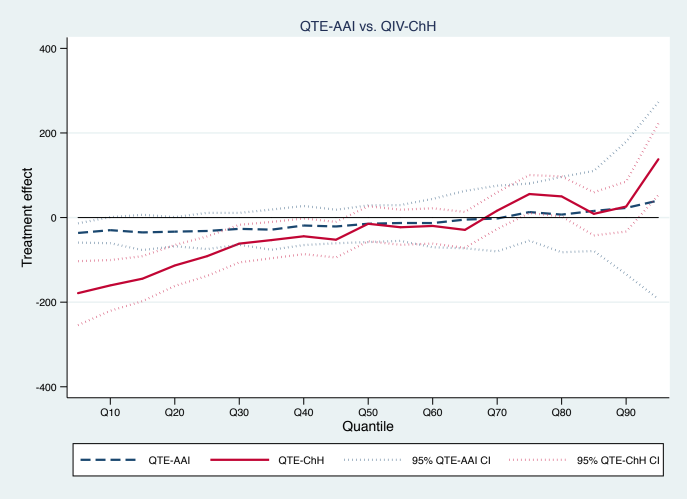
leg_{ER} is the earliest legal retirement age that an individual is eligible for.

Ordinary Least Squares Estimates vs. Ordinary Quantile Regression

Quantile Regression vs. Quantile Treatment Effect (AAI)



Quantile Treatment Effect by the two estimators QTE-AAI and QIV-ChH



Model specification

Specification of the model in a country specific setting:

$$Y_i = \alpha_0 + \alpha_1 D_i + \beta^\top X + \varepsilon_i$$

where:

Y_i - personal lifetime income

D_i - binary indicator taking value 1 if an individual retired beyond the relevant cut-off treshold, and 0 if an individual retired before

X - set of cohort dummies.

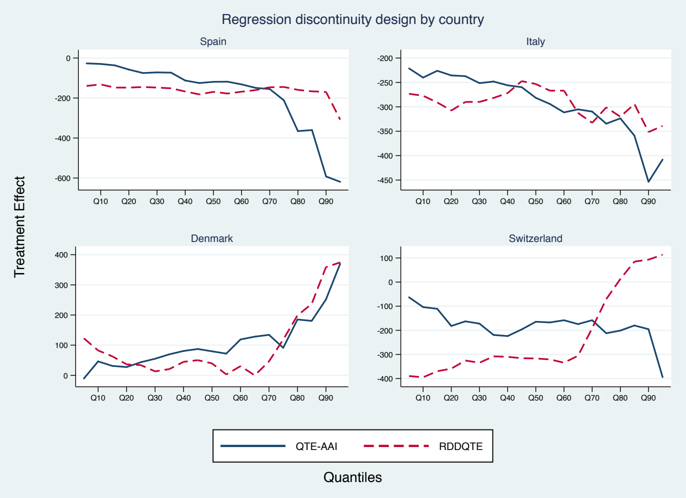
Estimation and identification

- Issues : Endogenity
- Identification: Quantile Instrumental Variables in Regression Discontinuity Design
  - Frandsen, Foelich & Melly (2012)
- Instruments:

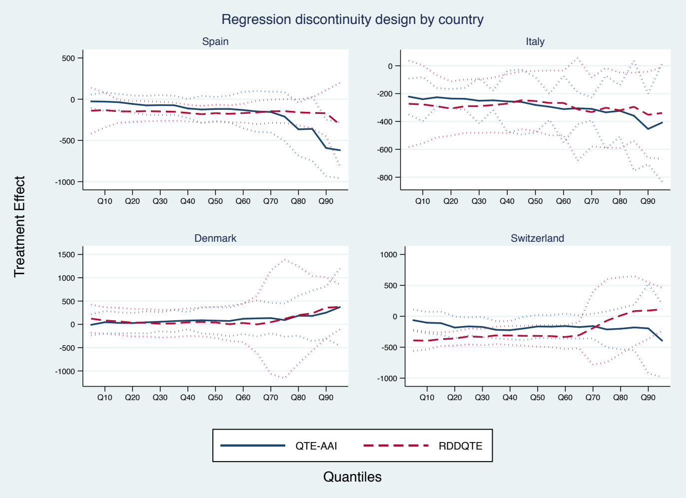
$$Z_i = 1(B_i \geq b_0)$$

B_i - running variable (year of birth)

Quantile Treatment effect of retirement on lifetime income by country in RD design



Quantile Treatment effect of retirement on lifetime income by country in RD design



Conclusions

- Clearly heterogenous, redistributive effect of postponing retirement to later ages across the quantiles of lifetime income in the overall sample.
- Similarity of results of the two estimators (QTE-AAI and QTE-ChH) suggest that assumptions underlying both estimators are plausible.
- Subpopulation of compliers is a fair representation of the overall population.