Assessing trends in SE inequalities in mortality:

Pitfalls and promises of European longitudinal surveys

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Summary

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What trends for health inequalities in Europe?

- An increasing trend of health inequality (in terms of differential mortality by SES) has been recently found in US (Case & Deaton, 2015; 2017)
- What can we say about Europe?
- Mackenbach et al (2018) found that the health of the less educated has recently been improving in Europe, and health disparities are stabilising. Moreover no effect of economic recession is found.
- These findings usually come from register-based data, while survey data are typically used to measure socioeconomic differences in (self-reported) health.

Data

- We want to assess levels and trends in SE inequalities of mortality using available survey longitudinal data
- We therefore use data from EU-SILC and SHARE to estimate health inequality
- EU-SILC: provides an almost universal coverage of EU member states (with the notable exception of Germany) since 2004
- SHARE: 18 countries (but we only consider 14 of them) since 2004
- Using survey data for analysing differential mortality trends can have pros and cons

Pros

- Harmonised data for several countries.
- Trends can be estimated on the basis of regular waves
- Many possible socio-economic indicators are available (income, education, combination of both, deprivation index)

Cons

- Small sample size: estimated trends rely on specification of statistical models
- Biased estimates (mortality risk usually underestimated)
- EU-SILC follows individuals only for, at most, 4 waves
- SHARE follows only people aged over 50, with biannual waves

Estimation approach: EU–SILC

- we are dealing with 25 different countries, with many differences between them, especially in terms of number of deaths
- deaths under the age of 16 cannot be taken into account (because SES information is not available) and deaths over age 80 are grouped into a single age category.
- The regression model used is a Poisson model with the following covariates: age class, sex, calendar year, education level and (log) number of exposed population
- The age groups included in the model are rather broad (16-49, 50-79, 80+) as, especially for the younger group, the number of deaths can be too low to ensure a reliable fit
- Education level is defined by grouping the ISCED-97 levels into three categories: Low (ISCED 0-2), Medium (ISCED 3) and High-educated (ISCED 4+)
- The effect of calendar year is estimated through a quadratic spline which also interacts with education level

Estimation approach: EU–SILC

- The log of the size of the exposed population is included as an offset
- Sex does not interact with year nor with education level (so we cannot infer about sex-specific health inequalities, nor about their trend)
- Other solutions have been tested (zip models, random effects, spline over age)

Estimation approach: SHARE

- We focus on 13 European countries, who participated in at least 2 consecutive waves before 2010 and 2 consecutive waves after 2010
- The regression model used is a Poisson model with the following covariates: age (continuous), gender, educational level. The log of the size of the exposed individuals is included as offset
- Educational level is defined by grouping the ISCED-97 levels into three categories: low (ISCED 0-2), medium (ISCED 3), and high (ISCED 4+)
- To estimate the time trend, we run the model separately for each wave
- Other alternative specifications have been tried (age polynomials, period dummies and their interactions with educational categories)

Results from EU-SILC

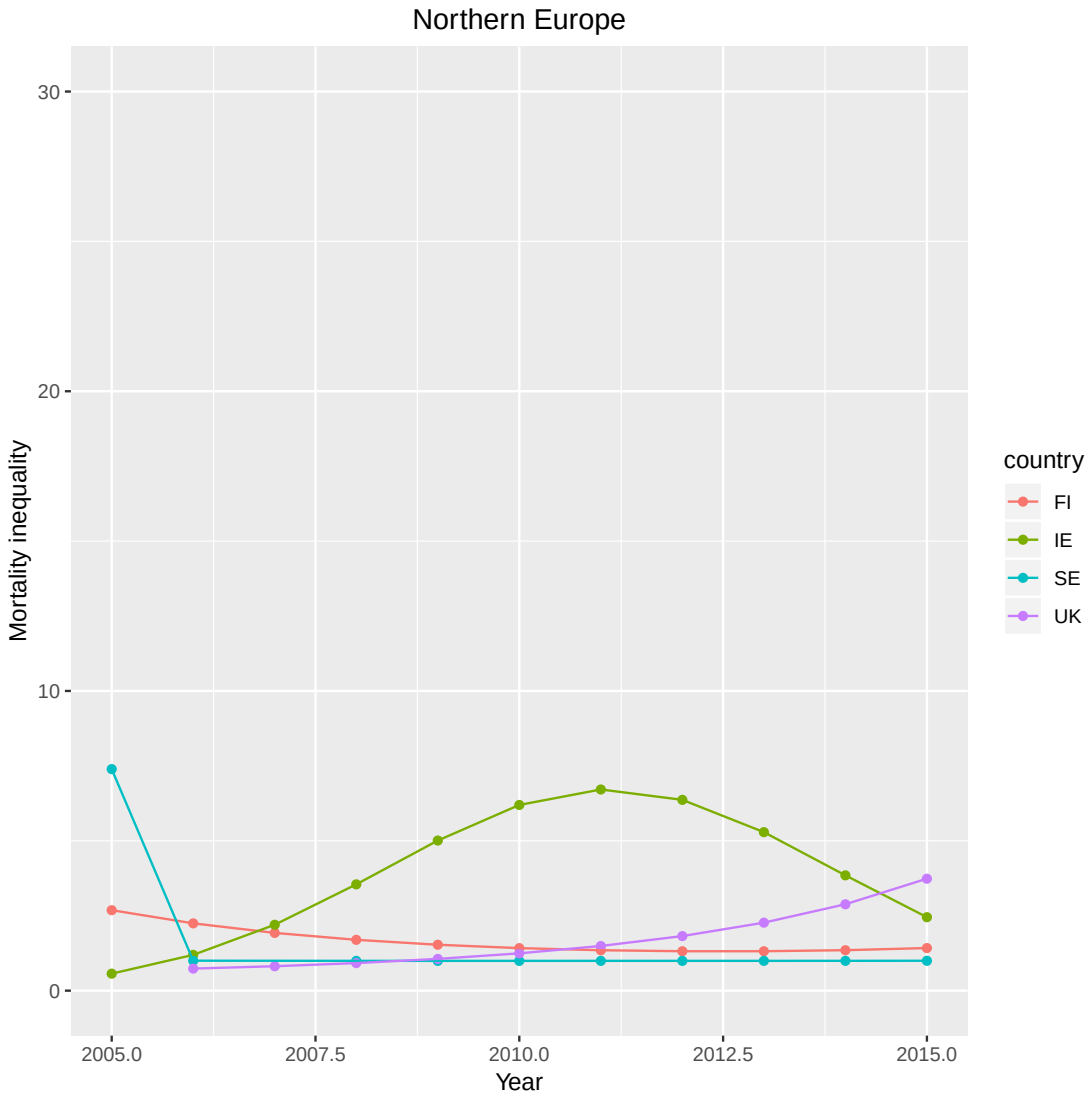

Figure: Risk ratios estimated from EU-SILC data. Northern Europe

Results from EU-SILC

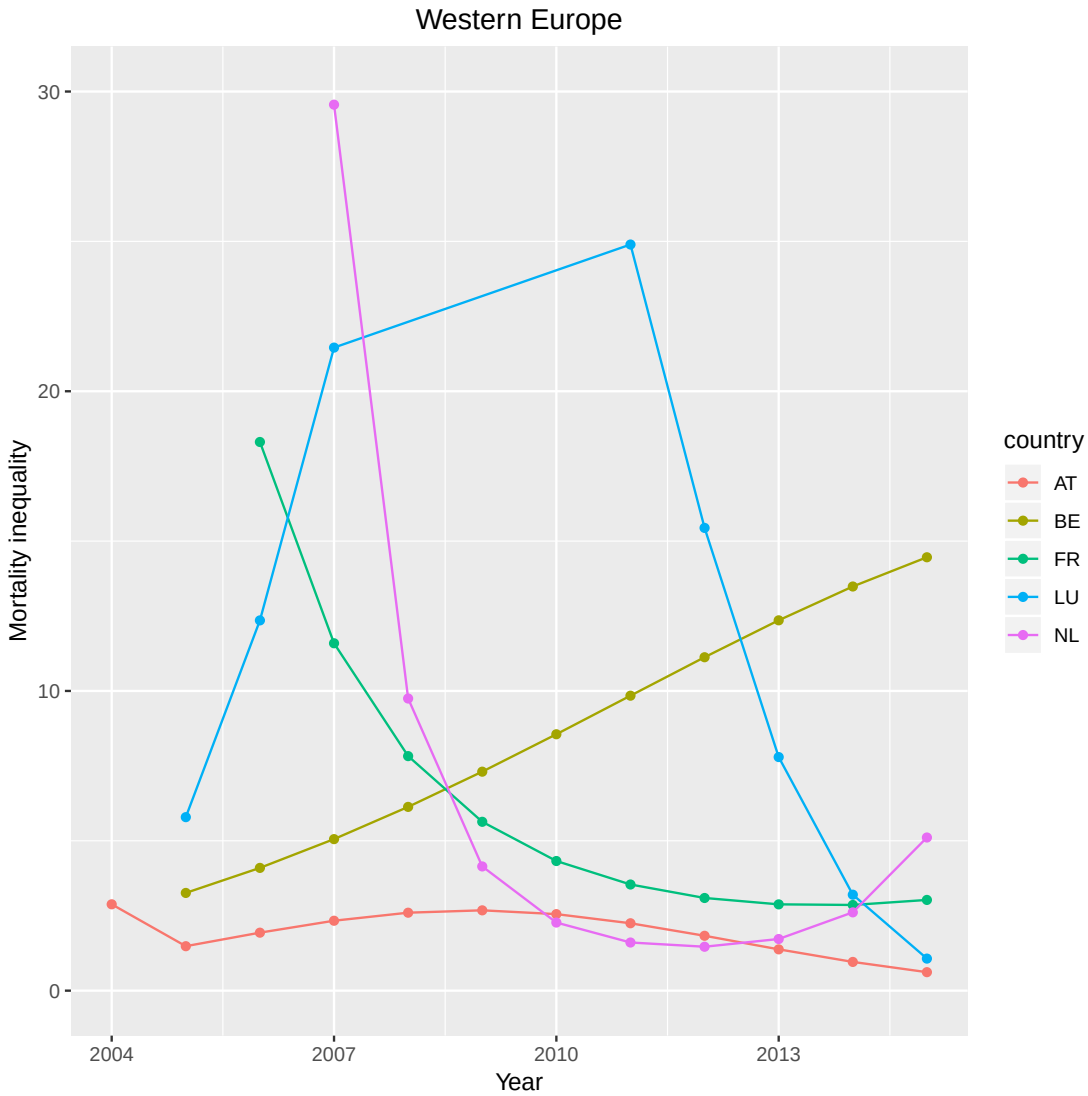

Figure: Risk ratios estimated from EU-SILC data. Western Europe

Results from EU-SILC

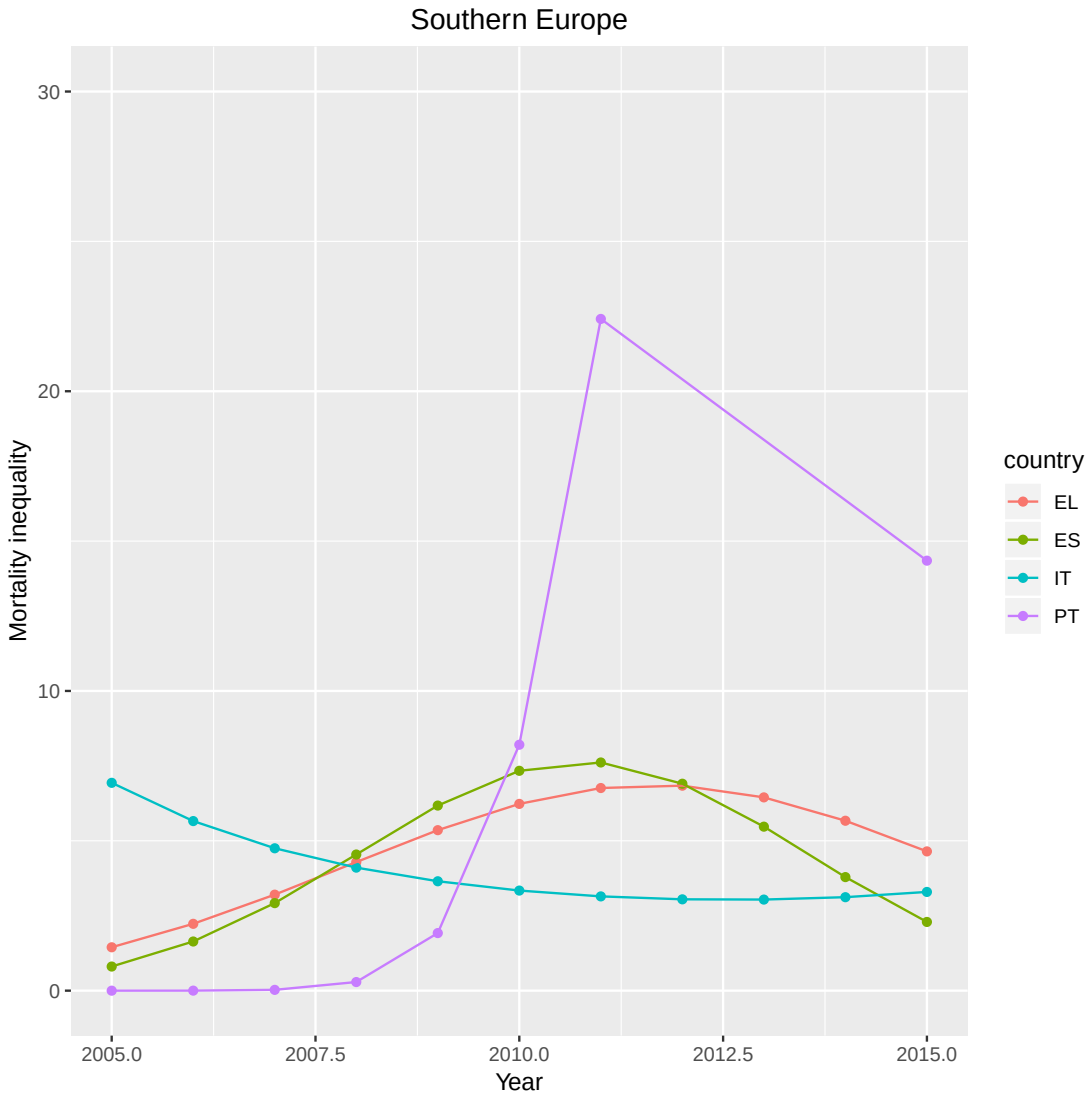

Figure: Risk ratios estimated from EU-SILC data. Southern Europe

Results from EU-SILC

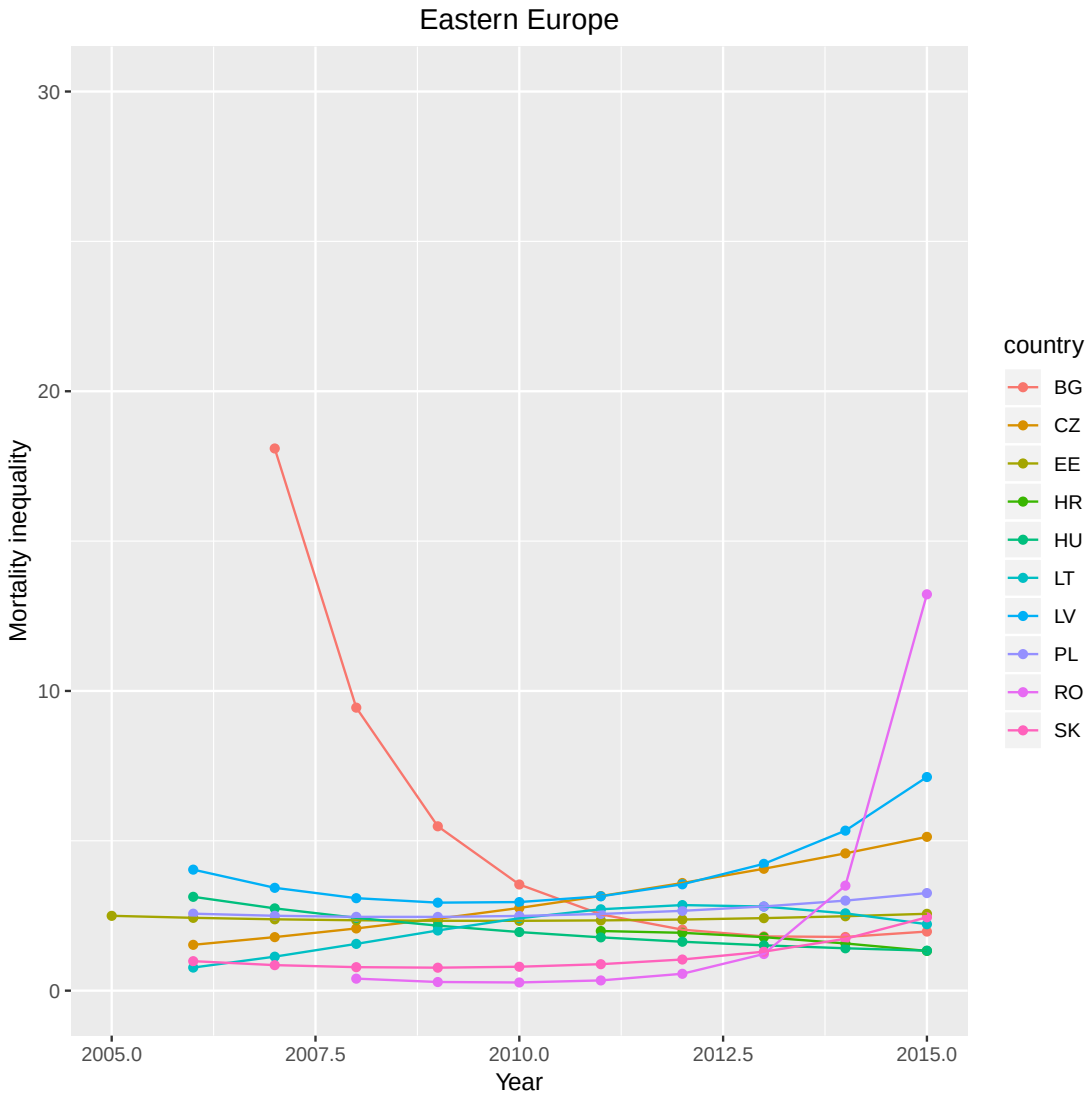

Figure: Risk ratios estimated from EU-SILC data. Eastern Europe

Results from SHARE

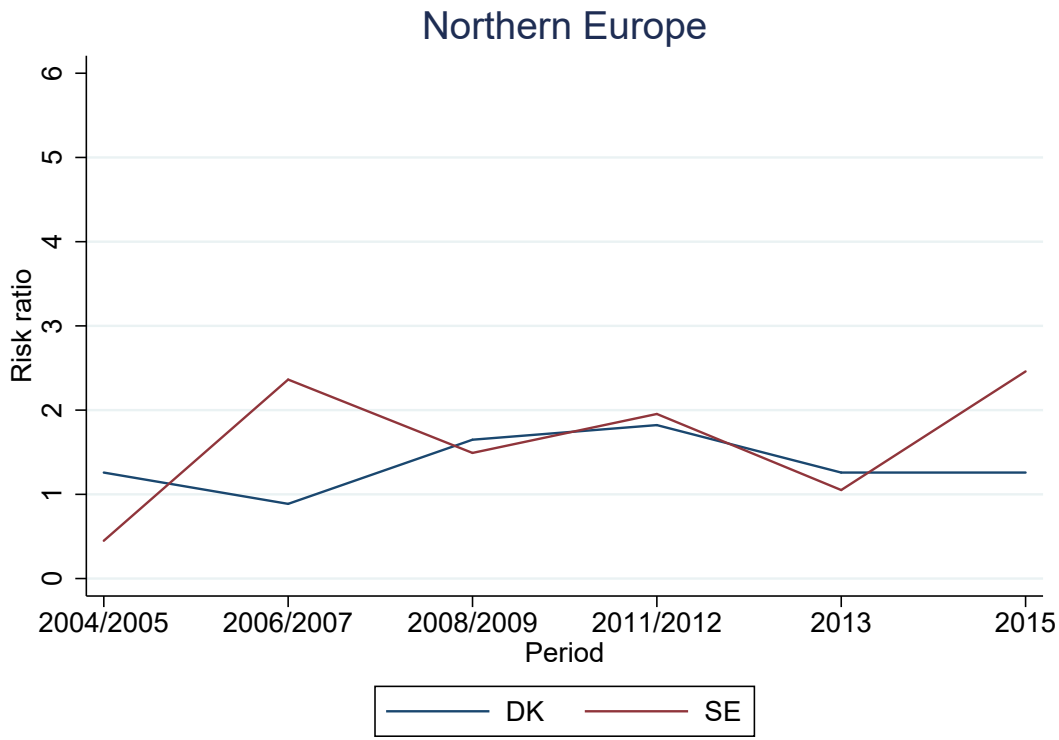

Figure: Risk ratios estimated from SHARE data. Northern Europe

Results from SHARE

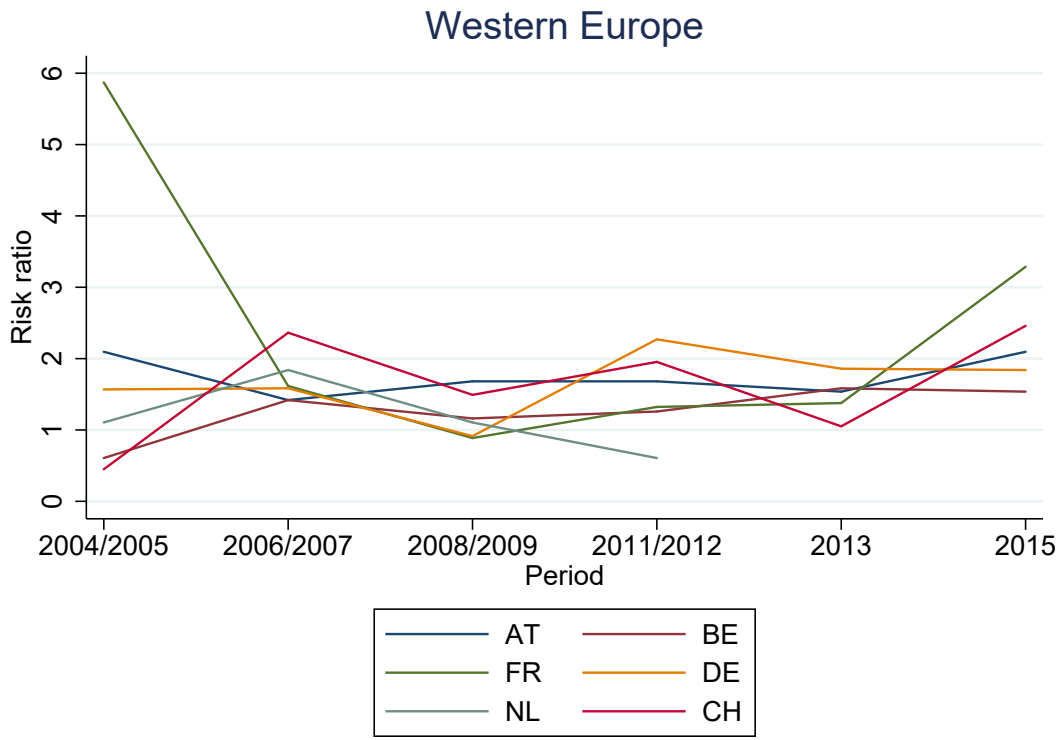

Figure: Risk ratios estimated from SHARE data. Western Europe

Results from SHARE

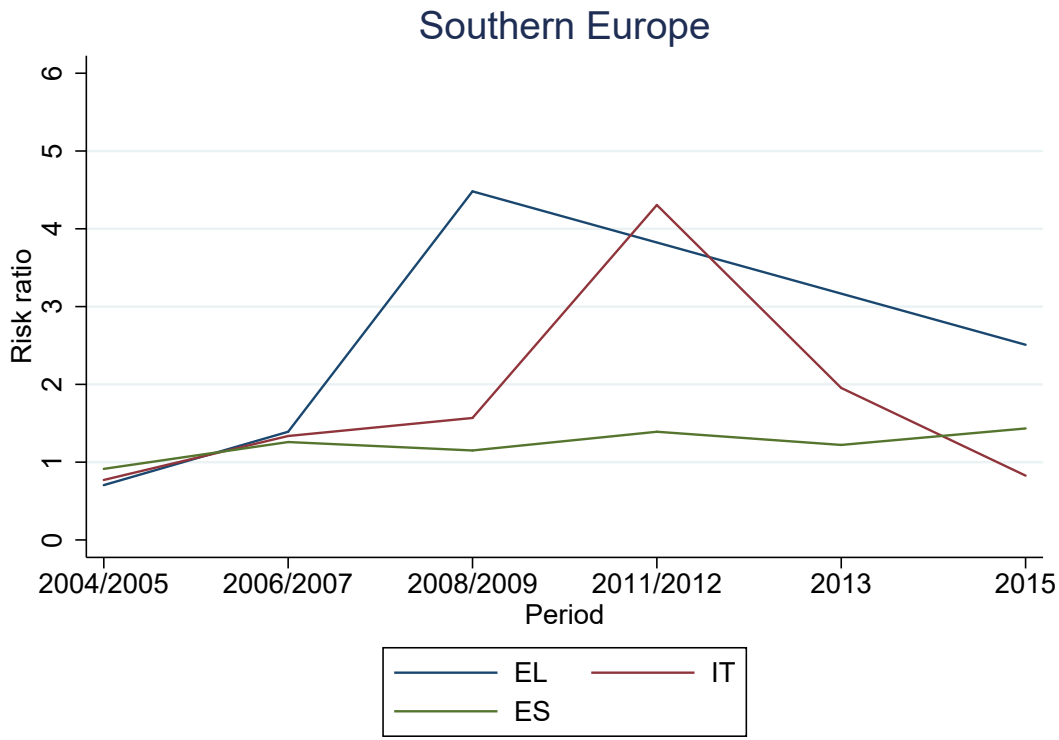

Figure: Risk ratios estimated from SHARE data. Southern Europe

Results from SHARE

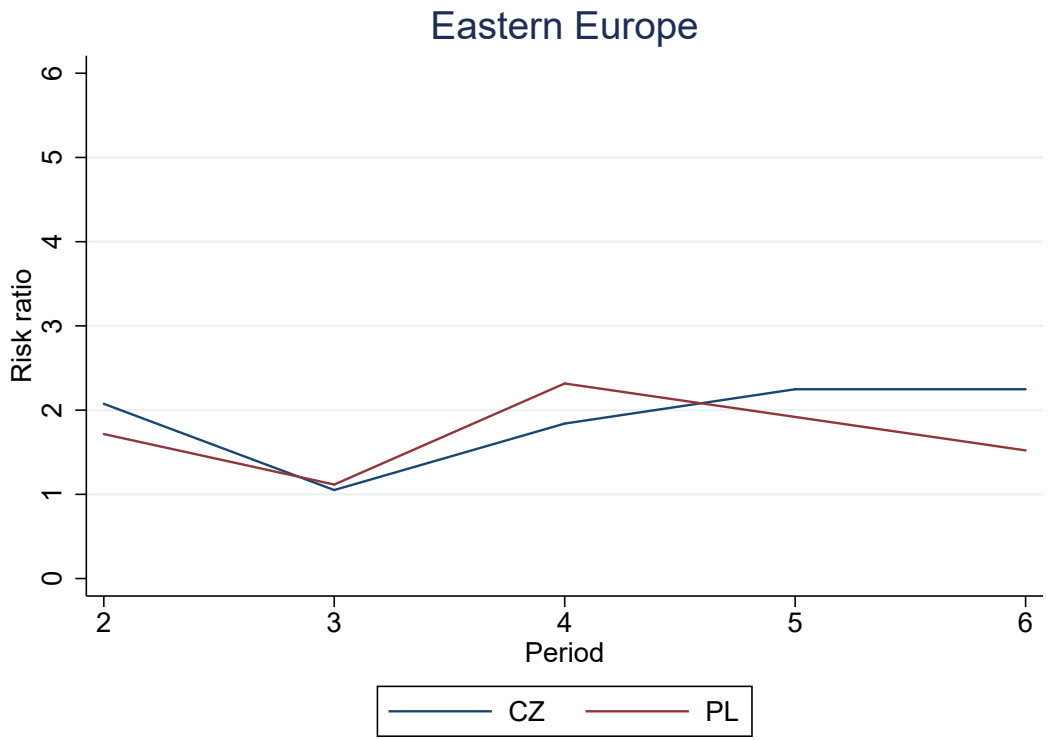

Figure: Risk ratios estimated from SHARE data. Eastern Europe

Concluding Remarks

- Interpretation should be careful: survey data might provide a highly limited number of events, making results highly dependent on model specification (e.g. Netherlands, 2007)
- Some discrepancies between SHARE and EU-SILC (but we should keep in mind the structural differences between two surveys).
- However, EU-SILC results provide some interesting insights:
  - Interesting pattern in Southern Europe (Greece, Spain, Italy): can we relate to recent economic recession? If so it would be an added value with respect the study by Machenback et al (2018).
  - Eastern Europe show an averagely increasing trend (PL, CZ, LV, SK, RO)
  - Western Europe show a more stable trend (as found by Machenback et al 2018)
- As for Northern Europe, results coming form register data are more reliable, SILC provides a very limited number of events (and SHARE a very limited number of countries). However the increasing trend for UK and Ireland should be considered

References

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