

Nowcasting risk of poverty in the EU

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Outline

- Motivation
- Toolbox
- Results
- Data issues
- Concluding remarks



Motivation

- EU-SILC statistics available with a 2-3 year time lag
- More timely indicators are needed

Our aim:

- To predict what the EU-SILC will show for current year
- To develop a method that can be applied for EU28

Our focus:

- At-risk-of-poverty rate
- Direction and scale of changes
- 17 EU member states
- SILC 2010 or 2012; nowcasts up to 2013 or 2014



Toolbox

- EUROMOD – tax-benefit microsimulation model for the EU
- Adjusting EUROMOD to account for employment changes
- Calibration to align EUROMOD and EU-SILC



Toolbox: (I) EUROMOD

- Static tax-benefit microsimulation model for the EU
 - ✓ Operates on EU-SILC cross-sectional **data**
SILC data need to be transformed into EUROMOD input data!
 - ✓ **Simulates** direct taxes, social insurance contributions and cash benefits
 - ✓ Non-simulated incomes **updated** using available indices (*e.g. earnings, CPI etc.*) plus official projections. Updating disaggregated where possible (*e.g. earnings by sector*)



Toolbox: (2.1) employment adjustments

- Adjusting EUROMOD input data for employment changes up to the latest available policy year

- Transitions modelled (net flows):
 - ✓ non-employment → employment
 - ✓ employment → short-term / long-term unemployment

- Short-term vs long-term unemployment
 - ✓ Important implications for receipt of unemployment benefits

- Inactivity
 - ✓ Modelled indirectly (if not eligible for unemployment benefit)




Toolbox: (2.2) employment adjustments

- Observations are selected for transitions based on **estimated probabilities** to be employed
 - ✓ Logit Model (split by gender)
 - ✓ Estimated on EUROMOD input data

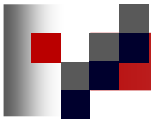
- The number of observations selected into transitions corresponds to the relative change in employment rates as shown in the **macro-level LFS statistics**
 - ✓ Most up-to-date source of information on employment
 - ✓ By age, gender, education (18 strata)

- **Incomes are adjusted** in line with transitions
 - ✓ Wages for new unemployed: set to zero
 - ✓ Wages for new employed: average within the stratum

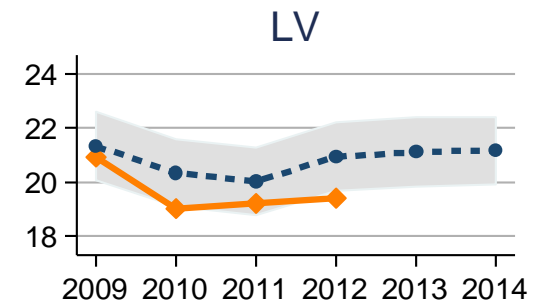
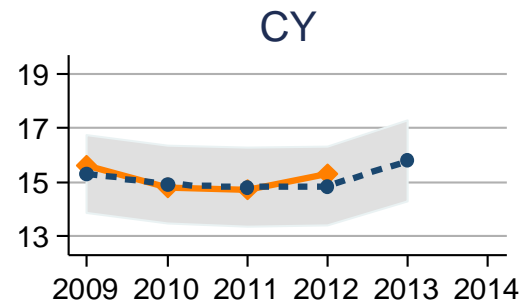
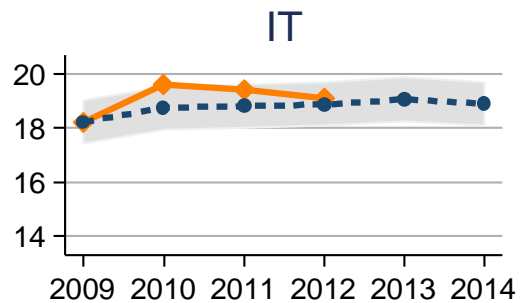
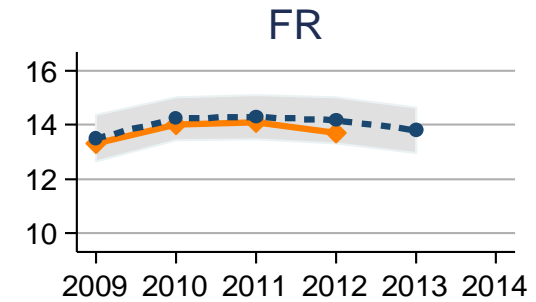
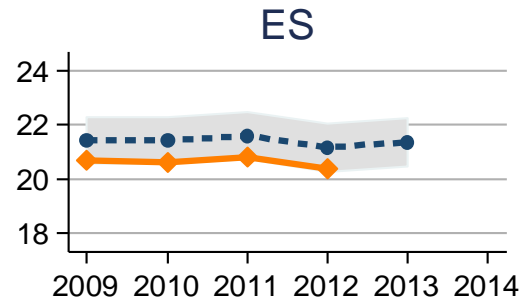
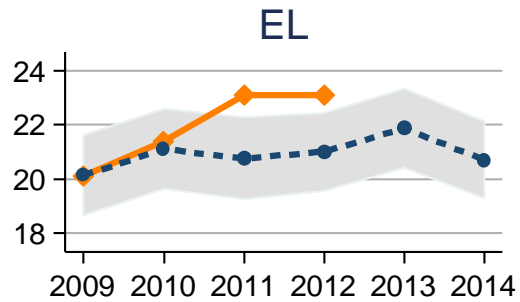
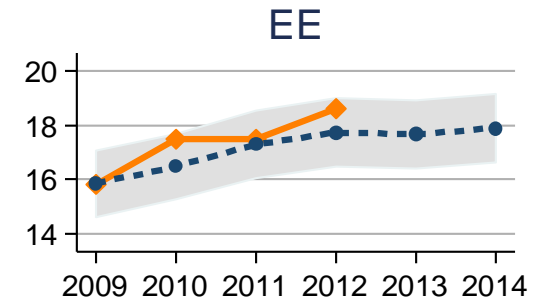
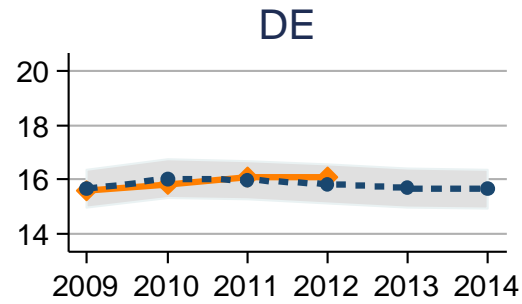
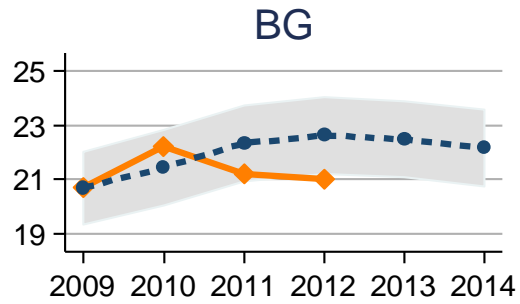


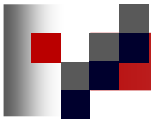
Toolbox (3): calibration

- EUROMOD estimates diverge from original EU-SILC even in the base year
- Sources of discrepancies:
 - ✓ Some concepts and definitions
 - ✓ Non take-up or leakage of means-tested benefits; tax evasion
 - ✓ Misreported income in SILC
 - ✓ Simulation error
- Calibration:
 - ✓ At household level
 - ✓ Aligns EUROMOD equivalised household disposable income to SILC (*variable HX090*)
 - ✓ Calibration factors are based on the first year (input data) and applied to all subsequent years

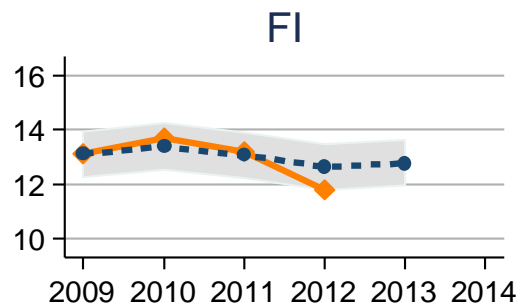
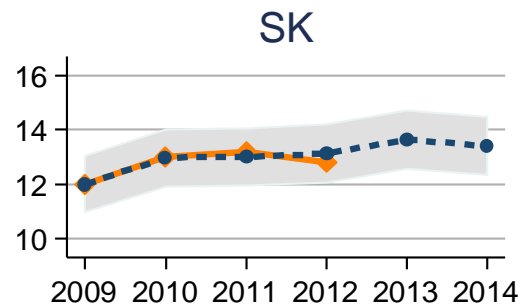
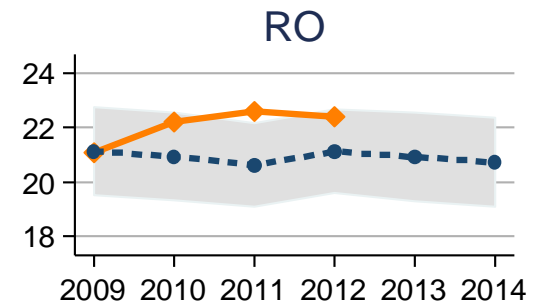
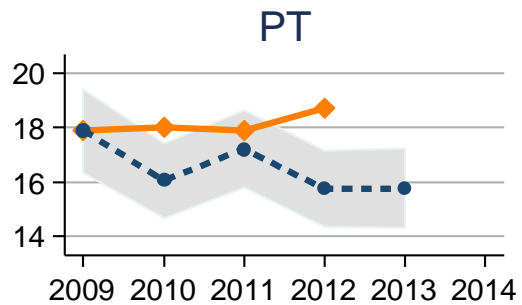
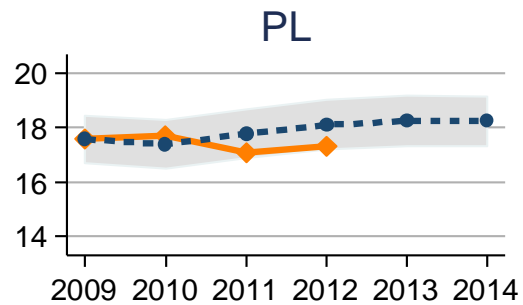
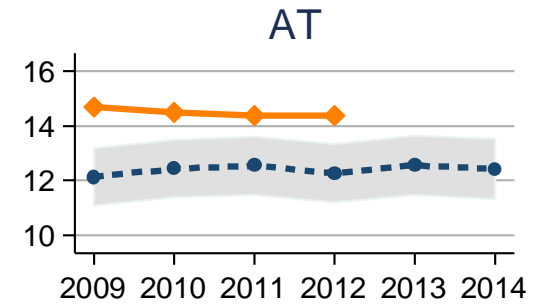
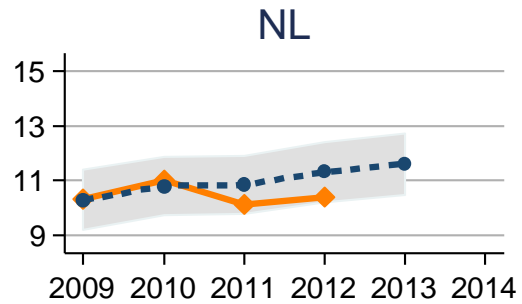
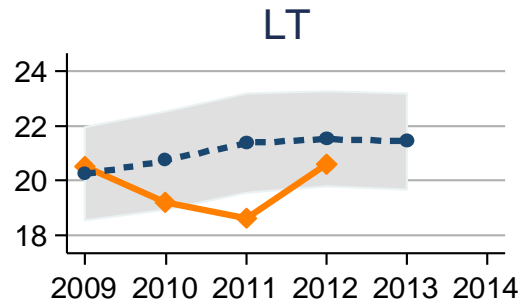


Results (I): AROP





Results (2): AROP





Results (3): main developments in 2012-2013/14

- Statistical significant increases in AROP in:
 - ✓ Cyprus (+0.95 pts in 2012-13)
 - ✓ Latvia (+0.68 pts in 2012-14)
 - ✓ Netherlands (+0.29 pts in 2012-14)

- Statistical significant decreases in AROP in:
 - ✓ Bulgaria, France, Germany (by less than 0.5 pts)

- Statistical significant decreases in child poverty in:
 - ✓ Greece, Latvia, Romania (by more than 1.5 pts)

Data issues (I): Breaks and Revisions

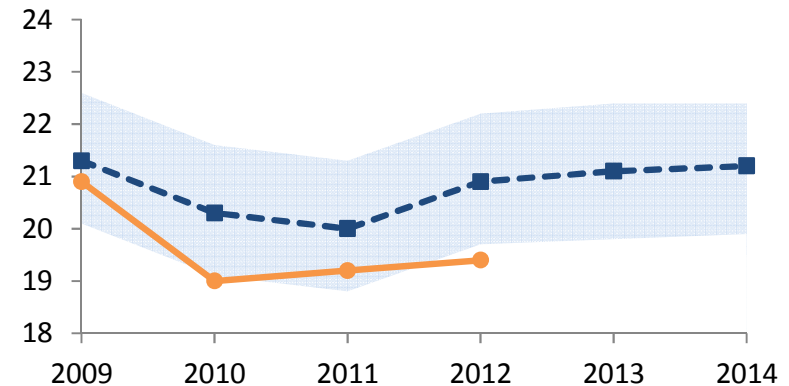
■ EU-SILC

- ✓ Breaks: only UK (2012)
- ✓ Backward revisions: ES, LV, LT, AT

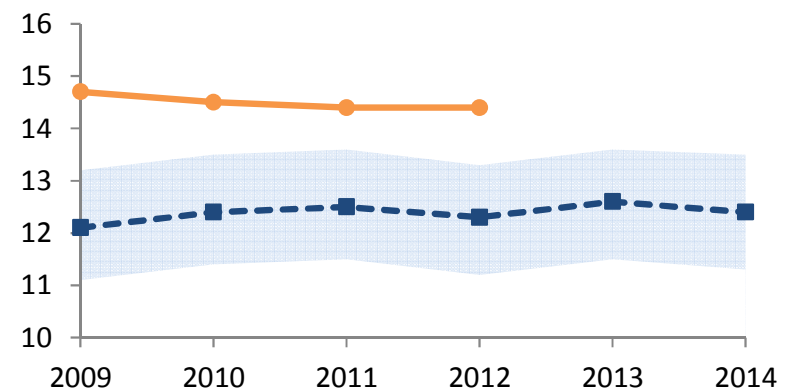
■ LFS (breaks):

- ✓ 2010 - PL
- ✓ 2011 – BG, DE, PT, SK
- ✓ 2013 – AT, FR, NL
- ✓ 2014 (1st quarter) – all countries

AROP: Latvia



AROP: Austria



Nowcast CI (SILC 2010)

EUROSTAT

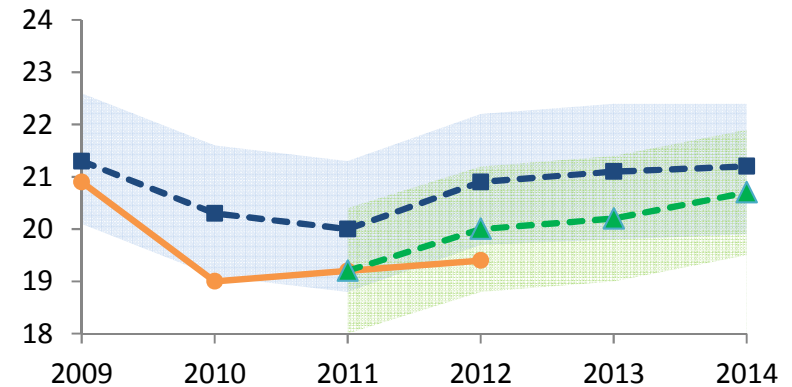
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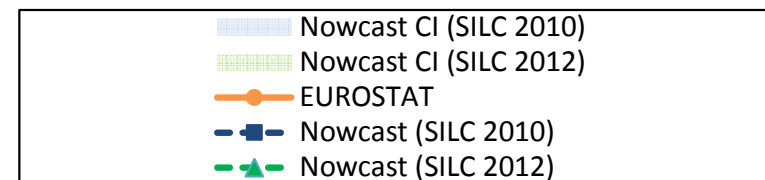
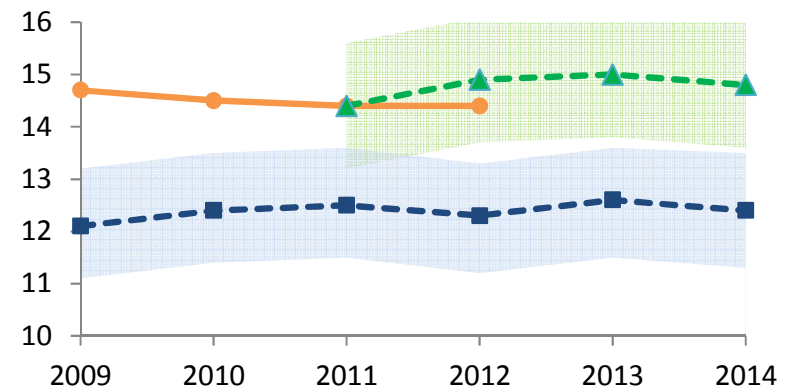
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AROP: Austria



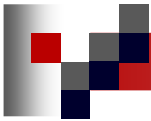
Data issues (2): Large sampling errors and weights

	SE around AROP	SD of weights (adjusted)
Bulgaria	0.85	0.60
Germany	0.30	0.39
Estonia	0.61	0.83
Greece	0.90	1.25
Spain	0.53	0.82
France	0.43	0.56
Italy	0.43	0.72
Cyprus	0.71	0.63
Latvia	0.90	0.51
Lithuania	1.02	1.23
Netherlands	0.67	0.94
Austria	0.57	0.51
Poland	0.47	0.69
Portugal	0.93	0.73
Romania	0.91	0.75
Slovakia	0.57	0.35
Finland	0.40	0.85

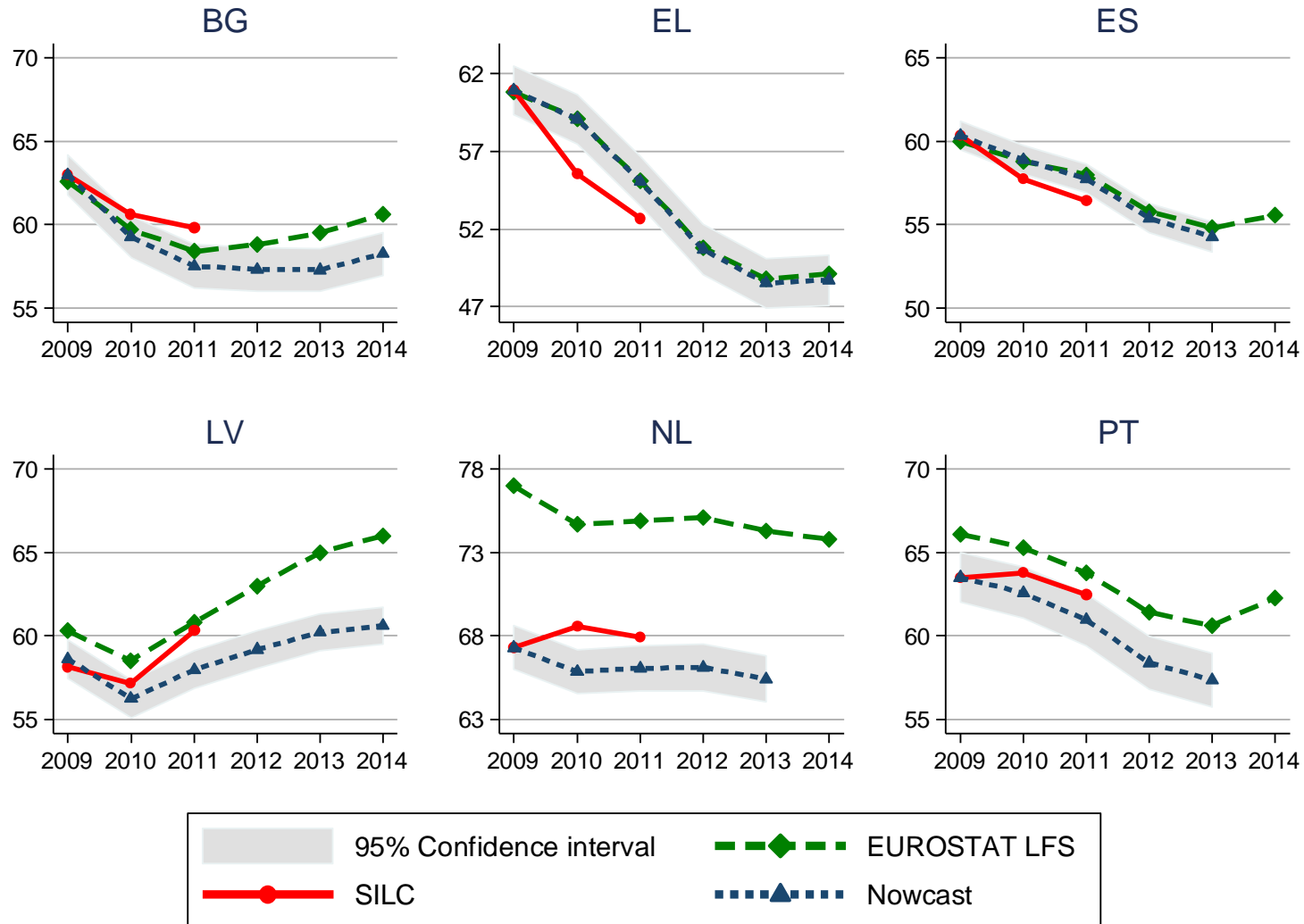
- Large SE around AROP: BG, EL, LV, LT, PT, RO

- Large weights: EL, LT

→ Nowcasting is less accurate



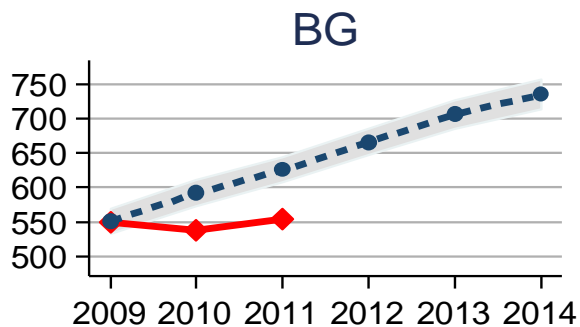
Data issues (3): Employment in LFS and SILC



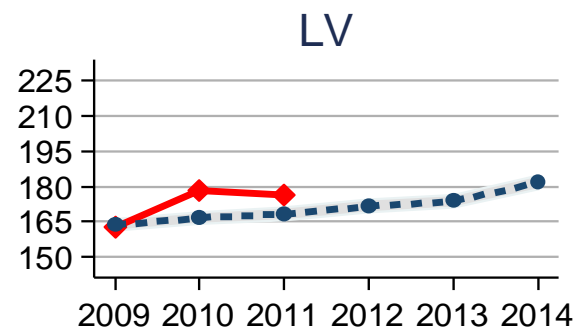
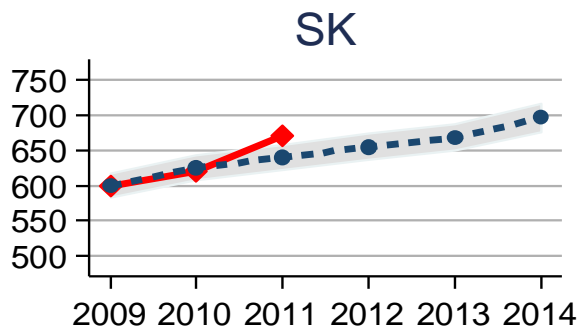
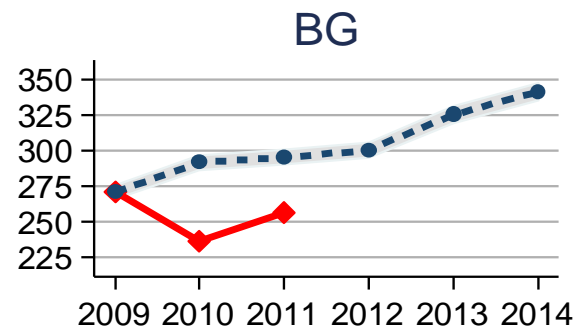
Note: Employment rate (15-64); gridlines 5 p.p.

Data issues (4): Income dynamics in SILC and external statistics

Employment income



Pensions



Note: Average monthly amounts in national currency; gridlines 8-10% of the mean



Concluding remarks (I): Data

- Breaks in time series
 - Large sampling errors and weights
 - Inconsistencies between trends in SILC and other data sources
- Reduce accuracy of nowcasting
- ✓ Cross-country documentation of methodological changes across years in SILC and LFS
 - ✓ Validation of EU-SILC vs. other sources of national or EU statistics



Concluding remarks (2): Methodology

- Test different methods to select observations for transitions
- Model more types of transitions
- Account for demographic changes and changes in household structure (by reweighting)
- Improve wage estimation for new employees
- Improve updating of non-simulated incomes