"Flash estimates" of income distribution indicators for the European Union: methods, assessment and future prospects

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Introduction

- Importance of the European Union Statistics on Income and Living Conditions (EU-SILC)

- Income data available with significant lag due to their complexity

- Timeliness of indicators is crucial:
  - ✓ *keeping track of the effectiveness of policies*
  - ✓ *Evaluating the impact of macroeconomic conditions on poverty and the income distribution*

- Current strategy for providing more timely income estimates is based on two pillars:
  - ✓ *Flash estimates on income distribution and poverty*
  - ✓ *Final EU-SILC microdata*

Methodological framework

1. Adjustment for changes in population characteristics

2. Reproducing the evolution of market income components

3. Accounting for changes in taxes and benefits using a microsimulation model

Methodological framework(1):
Changes in population characteristic

Data source:

- Labour Force Survey(LFS)

(1) Labour market transitions

Two types of transitions modelled:

- from non-employment into employment
- from employment into short/long-term unemployment

Logit models to estimate probability of being employed:

- explanatory variables include: age, marital status, education level, etc.
- model estimated separately for men and women

Unemployment benefits are simulated according to country rules

Methodological framework(1): Changes in population characteristic

(2) Reweighting

Allows controlling for a wider set of population characteristics

Three alternative methods tested:

- ✓ Calibration at household level based on marginal distributions of a set of variables from LFS

- ✓ Calibration at household level based on changes in shares for same set of variables

- ✓ Calibration at individual level based on specific socio-demographic groups

Reweighting not suitable in times of rapid economic changes

Methodological framework(2):
Updating income sources

Analysis makes use of EUROMOD (microsimulation model based on EU-SILC data)

EUROMOD uprating factors

- Based on admin or survey data
- Country – specific uprating factors derived for each income source

Model-based factors for socio-demographic groups

- Introduces differential growth rates of income via a model-based approach

- EU-SILC time series for 2009-2012 used to compute average growth rates for pre-defined socio-demographic categories

- Use decision trees and logistic regression models to choose the categories

- Estimate current growth rates of the categories using dynamic factor modelling approach

Methodological framework(3): Tax-benefit simulation

EUROMOD used for simulation

Income elements simulated: *universal and targeted cash benefits, social insurance contributions, direct taxes.*

Incorporate tax evasion and benefit non take-up wherever possible

Adjustment made to account for differences in EUROMOD and EU-SILC household income estimates

- assume discrepancy between the two is stable over time

Quality framework

- **Consistency of trends in auxiliary data sources**

- **Retrospective assessment based on:**

  - ✓ Intermediate checks for all production stages
  - ✓ Ability of the model to reproduce past estimates for main economic indicators

- **Quality measures for flash estimates:**
  - ✓ Incorporate the role of uncertainty
  - ✓ Integrate information from different methods and their historical performance to produce a measure of quality of flash estimates

Assessment of results for flash estimates

Average consistency by indicator and methods (2012/11 and 2013/12)

Indicator /Method		AT	CZ	FI	FR	IT	LU	LV	PL	PT
AROP	Labour transitions	95%	83%	89%	92%	98%	71%	94%	99%	99%
AROP	CAL_H_A	97%	86%	90%	93%	97%	79%	96%	97%	97%
AROP	CAL_H	98%	91%	90%	91%	96%	81%	97%	97%	96%
AROP	CAL_I	97%	88%	90%	93%	97%	79%	95%		96%
D10	Labour transitions	96%	97%	99%	99%	92%	96%	96%	99%	97%
D10	CAL_H_A	96%	97%	98%	98%	96%	95%	94%	97%	97%
D10	CAL_H	96%	98%	98%	97%	94%	95%	94%	97%	97%
D10	CAL_I	96%	98%	98%	98%	96%	96%	91%		96%
MEAN	Labour transitions	94%	98%	98%	97%	99%	99%	96%	99%	98%
MEAN	CAL_H_A	95%	99%	99%	90%	98%	99%	96%	98%	99%
MEAN	CAL_H	95%	99%	99%	89%	97%	98%	96%	98%	99%
MEAN	CAL_I	95%	99%	99%	89%	98%	99%	94%		99%
MEDIAN	Labour transitions	96%	98%	98%	96%	99%	99%	95%	99%	97%
MEDIAN	CAL_H_A	97%	99%	99%	97%	98%	98%	96%	98%	98%
MEDIAN	CAL_H	96%	99%	98%	97%	97%	98%	96%	98%	98%
MEDIAN	CAL_I	97%	99%	98%	98%	98%	99%	94%		99%
QSR	Labour transitions	91%	93%	96%	97%	87%	93%	93%	97%	96%
QSR	CAL_H_A	95%	95%	97%	72%	99%	92%	91%	97%	96%
QSR	CAL_H	95%	97%	97%	69%	95%	93%	93%	97%	96%
QSR	CAL_I	95%	96%	97%	72%	98%	93%	93%		96%

Note: The methods considered are: (1) Labour transitions; (2) Calibration at household level: Cal_H; (3) Calibration at household level adjusted: Cal_H_A; (4) Calibration at individual level: Cal_I. Calibration at individual level is not available for Poland. The indicators are: AROP (at-risk-of-poverty rate); D10 (decile 10), mean and median equivalised household disposable income; QSR (income quintile share ratio).

Conclusions

- No single method shows better performance for all indicators and all years

- Further work will focus on the development of uncertainty measures

- Alternative estimates from EU Member States will help inform the decision for a set of flash estimates at a EU level

Comments

- An alternative strategy may be to estimate year-on-year change and apply to the last observed value

- Different methods may be appropriate for different countries

- Issues with data availability in different countries

- How realistic is the assumption that the discrepancy in income estimates between EU-SILC and EUROMOD is constant over time?