Joint distribution of income, consumption and wealth

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1. Relevance
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Interest in understanding the impact of social and fiscal policies on poverty and inequality
Three dimensions of economic vulnerability or wellbeing

- Income
- Consumption
- Wealth
Three different data sources

Income: EU-SILC - Statistics on Income and living conditions

Consumption: HBS – Household budget survey

Wealth: HFCS - Household finance and consumption survey
Statistical matching using "random hot-deck" method:
- Stratify SILC and HBS data using common categorical variables
- For each observation in the recipient dataset (SILC) randomly select an observation from the corresponding stratum of the donor dataset (HBS)
Statistical matching

Preparation:

1. Ex-post harmonisation of common variables (defining a common reference person & household structure)
2. Selection of potential candidate variables based on Hellinger distance
3. Backward regression to select variables with highest explanatory power
Statistical matching

Core process:

4. Random hot-deck selection of donor observations (100 repetitions)
5. Re-calibration of SILC weights to fit a number of consumption margins from HBS

6. Repeat procedure for matching HFCS (donor) to the matched SILC-HBS (receiver) dataset using hh type + food consumption quintile + tenure status as matching variables
Statistical matching

Result:

• Joint SILC-HBS-HFCS micro dataset for Euro countries
• Joint SILC-HBS micro dataset for other countries

Experimental aggregate statistics of income, consumption and wealth
Methodology

Methodological weakness

Hot-deck method is based on the Conditional Independence Assumption (CIA)
Example: Belgium

Six selected matching variables:

- Age class of the reference person
- Activity status of the reference person
- Main source of income
- Income quintile
- Tenure status
- Density level
Age class of the reference person

BE

- HBS 2015
- SILC 2016
Activity status of the reference person

- Working
- Unemployed
- Retired
- Student
- Fulfilling domestic t.
- Permanently disabled
- In compulsory military service
- Not applicable
- Not specified
Main source of income

BE

Wages
Income from self-employment
Property income
Pensions
Unemployment benefits
Other benefits

HBS 2015
SILC 2016
Heatmaps: population distributions by income and consumption deciles, BE 2015

Original HBS data

Y: HBS – consumption deciles
X: HBS – income deciles

Matched dataset

Y: HBS – consumption deciles
X: SILC – income deciles
BELGIUM

![Graph showing consumption vs. income with two lines labeled HBS 2015 and matched_data. The graph includes a shaded area representing the variability of the data.]
Preliminary results

Median consumption by income decile, 2015
CENTRAL/NORTHERN EUROPE

Thousand EURO

INCOME DECILES
Preliminary results

Median consumption by income decile, 2015
SOUTHERN EUROPE

Median consumption (in 1000 Euro)

INCOME DECILES

Thousand EURO

MEDIAN CONSUMPTION

0 10 20 30 40 50 60 70 80

CY  EL  ES  HR  MT  PT
Preliminary results

Median consumption by income decile, 2015
EASTERN EUROPE

Median consumption (in 1000 Euro)

EASTERN EUROPE

bg

Median consumption by income decile, 2015
EASTERN EUROPE

Median consumption (in 1000 Euro)

EASTERN EUROPE

bg
Preliminary results

Median saving rates (%) by income quintile, 2010 & 2015
-> positive trend

Note:
savings = disposable income – consumption
saving rates = savings as percentage of disposable income
consumption = Total consumption expenditure – imputed rents

Belgium  Ireland  Latvia  Poland
Preliminary results

Median saving rates (%) by income quintile, 2010 & 2015 -> increasing inequality

Bulgaria  Greece  Finland  Portugal

Note:
savings = disposable income – consumption
saving rates = savings as percentage of disposable income
consumption = Total consumption expenditure – imputed rents
Preliminary results

Gini coefficient on savings, 2010 & 2015
Preliminary results

Proportion of households at risk of asset-based vulnerability after a certain period of time

Source: European Central Bank, computation by Eurostat
Next steps

- Conduct the exercise for the missing countries.
- Assess the quality of matched micro datasets.
- Publish 2015 meso-level indicators.
- Publish metadata & quality reports.
- Get feedback from potential data users and the research community!
Feed-back?


Join the user forum or email:

ESTAT-ICW@ec.europa.eu
Thanks

Many thanks to You for your attention and to Pierre Lamarche for his work