Monetary poverty indicators at local level: evaluating the impact of different poverty thresholds and the cost of living

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Brussels, 15 March 2019

Aims of the presentation

- The importance of estimating poverty indicators at sub-national level is nowadays worldwide recognized
- Poverty is a multidimensional concept: we focus here on relative monetary poverty indicators
- There are relevant issues when computing sub-national poverty indicators that may impact their value, namely:
  1. the choice between the use of income or consumption data;
  2. the use of national or local poverty lines;
  3. taking into account the local cost of living;
  4. the use of small area estimation techniques.

Aims of the presentation

- The aim is to estimate Italian households' Head Count Ratio (HCR) or At-Risk-of-Poverty-Rate (ARPR)

- We use consumption expenditures data from the Italian Household Budget Survey (HBS) 2012 to estimate the HCR for the 20 regions (NUTS-2 level) and the 110 provinces (NUTS-3 level) in Italy

- The issues we address are:
  1. the use of national or local Poverty Lines (PLs) to estimate the poverty incidence in Italy;
  2. the computation of local Purchasing Power Parities (PPPs) to take into account the local differences in price levels;
  3. the use of Small Area Estimation (SAE) techniques to estimate the ARPR, the poverty lines and the PPPs for Italian provinces (NUTS-3 level).

The use of consumption data to estimate the poverty incidence

- In Italy the relative and absolute poverty incidence is computed by Istat by using data from the Household Budget Survey

- To compute the relative poverty incidence, the poverty line is set, for households of two components, equal to the mean per-capita expenditure computed at national level (1015.2 Euros in 2012)

- The poverty line for households with a different number of components is then obtained by multiplying it with a specific coefficient (0.60 for households with one member, 1.33 for households with three members, etc.)

The use of consumption data to estimate the poverty incidence

- The PL used in the computation of the HCR with expenditures data depends on the level of the mean per-capita consumption expenditures that in Italy varies strongly among regions
- The percentage difference reaches the 50% comparing northern with southern Italian regions
- Therefore, it is important to evaluate the impact of the use of sub-national poverty lines in measuring the poverty incidence
- At regional level (NUTS2 level) direct survey estimates are statistically sound

Household poverty incidence at regional level with national and regional PLs

HCR with National PL and with Regional PL Consumption 2012
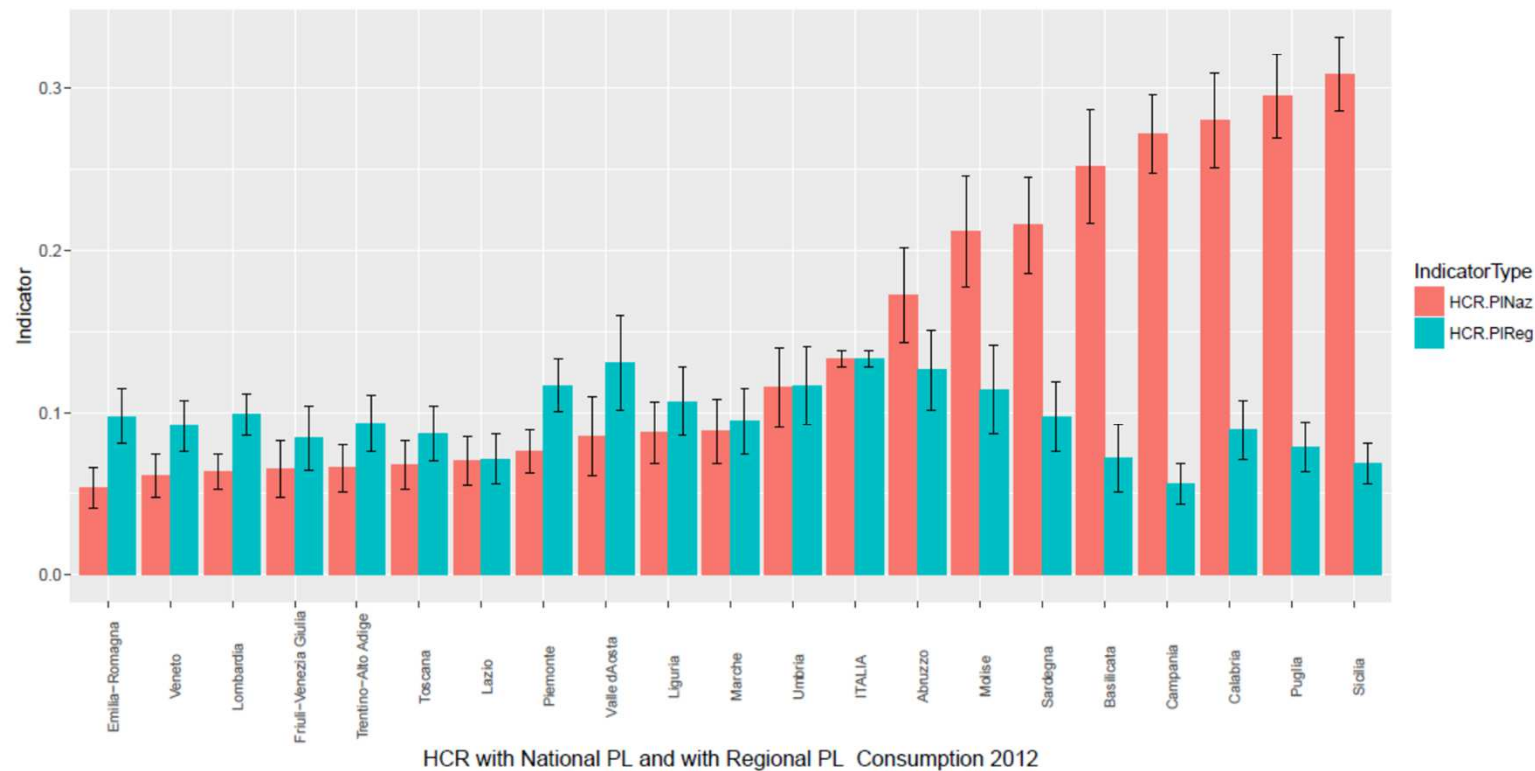
Household poverty incidence at regional level with national and regional PLs
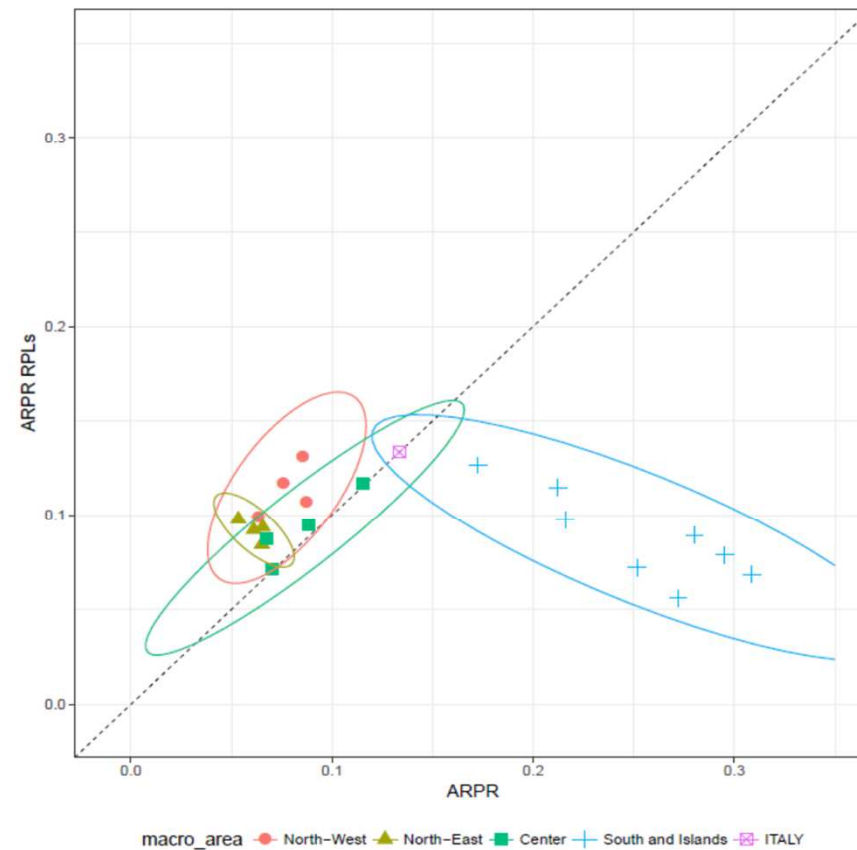
Household poverty incidence at regional level with national and regional PLs

- The use of different PLs has strong geographical implications in the evaluation of Italian households' poverty
- The choice of the poverty definition and of the PL depends on the level of analysis and the kind of the policy to be implemented (Kangas and Ritakallio, 2007)
- For comparing relative monetary poverty at regional (local) level, it seems justified the use of region-specific PLs (Mogstad et al., 2007)

Household poverty incidence at provincial level with national, regional and provincial PLs

- Having observed a high impact of the regional PL definition on the regional HCRs, we extend the analysis at the provincial level
- When computing the HCR at provincial level, the PL can be defined not only at national or regional level, but also at provincial level
- The 2012 HBS sample size at provincial level, varying from zero to 1037, with a median value of 146, is for most of the provinces too small to obtain reliable estimates both of the HCRs and of the PLs at provincial level
- Therefore, we use a small area model to obtain more accurate estimates
- *Measuring Poverty and Social exclusion by small area estimation*, Fasulo A., D'al M., Bertarelli G. et al.

Household poverty incidence at provincial level with national, regional and provincial PLs

- The HCR estimates at the province level are estimated using an area-level Fay-Herriot model (Fay and Herriot, 1979)

- This method uses aggregated auxiliary data to model direct estimates of the HCR to reduce their variability

- As auxiliary variables at the province level we use the per-capita taxable income (information available from the "Agenzia delle entrate" database 2012) and the share of households who own their house (from the Population Census 2011)

- We also estimate the provincial PLs by using a small area model, equal to the one used for provincial HCR estimates

SAE models

Table: HCR SAE model parameters. Model with National PL (NPL), Regional PLs (RPLs) and Provincial PLs (PPLs).

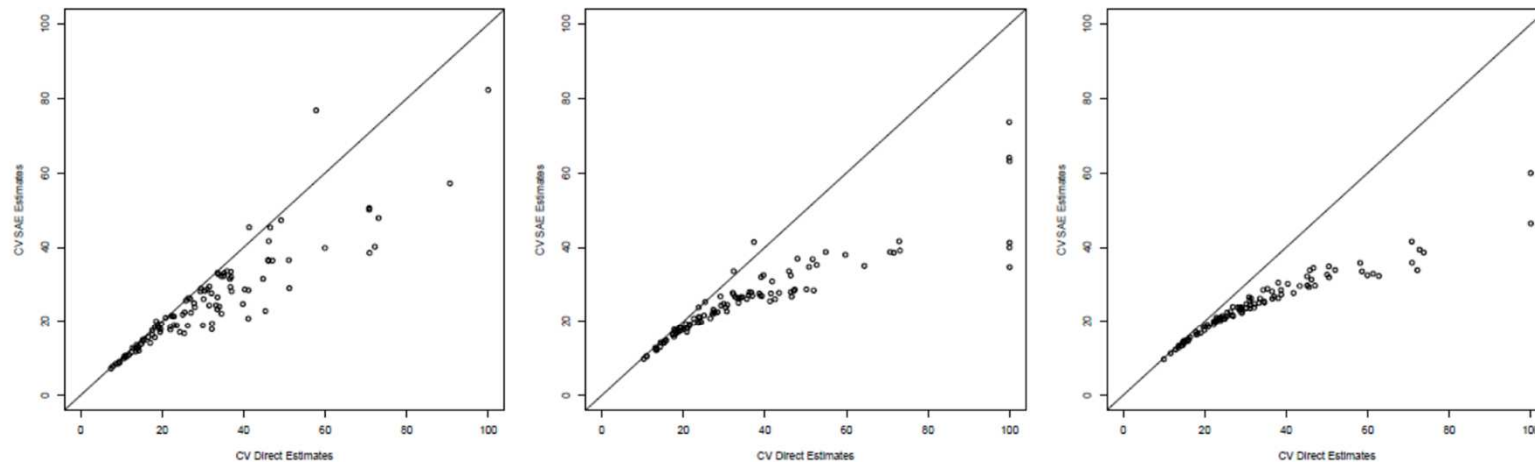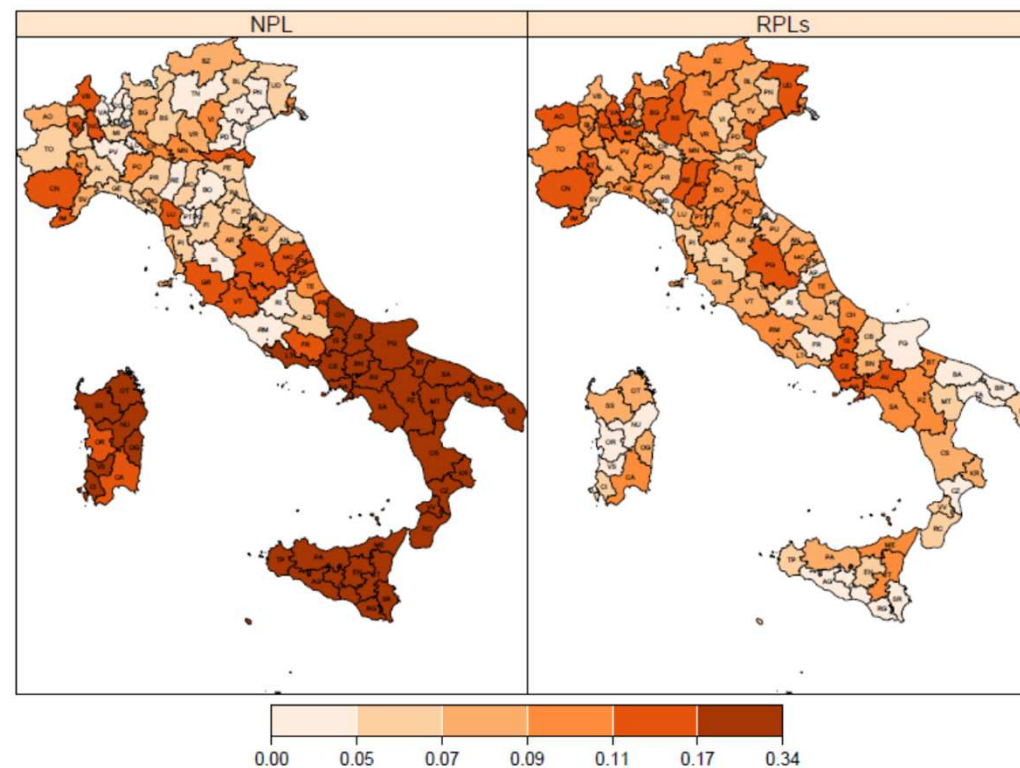| HCR	NPL	RPLs	PPLs
Taxable Income Per Capita $\times 1000$	-0.027***	0.004**	0.003*
Share of house owners	-0.005***	-0.002*	-

SAE models

Figure: Plot of the CV of direct estimates versus SAE estimates for the models of the HCR with NPL, RPLSs and PPLs.
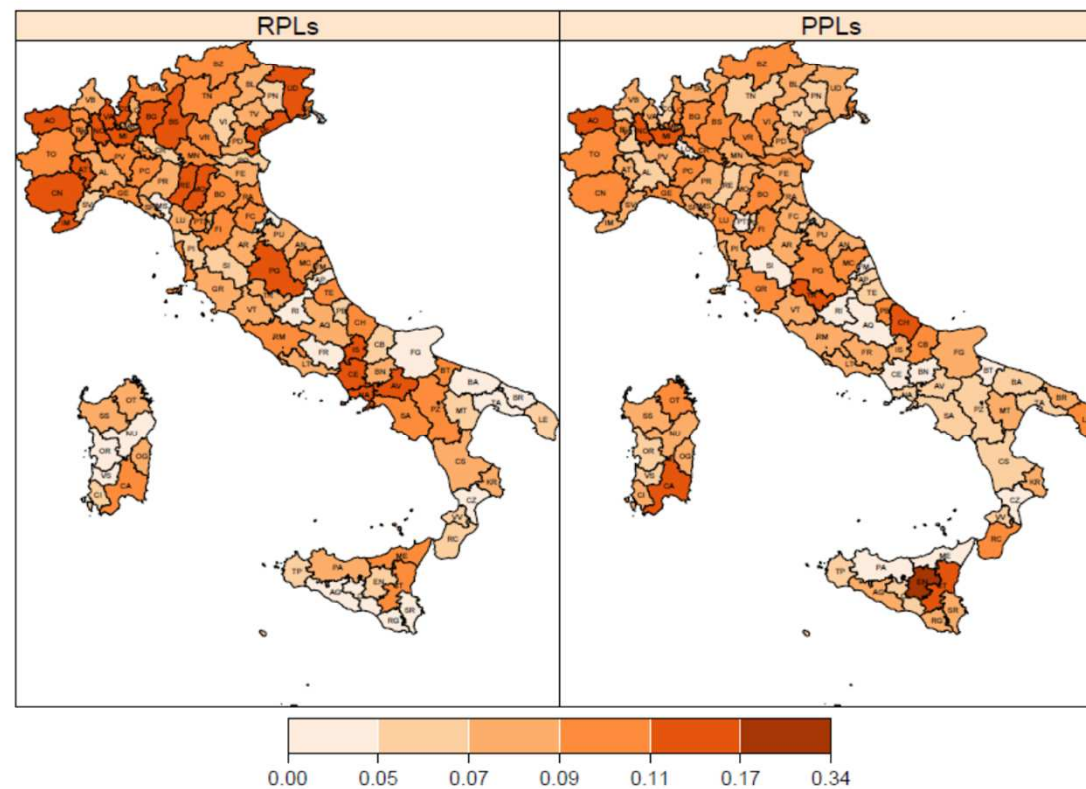
Household poverty incidence at provincial level with National PL (NPL) and Regional PLs (RPLs)

Household poverty incidence at provincial level with National PL (NPL) and Regional PLs (RPLs)
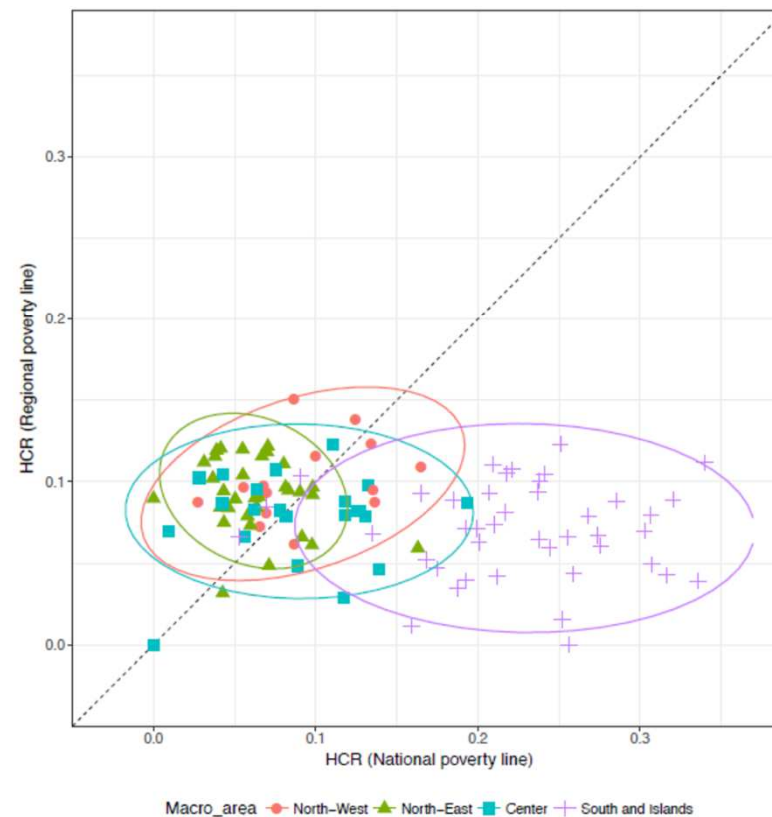
Household poverty incidence at provincial level with Regional PLs (RPLs) and Provincial PLs (PPLs)

- Switching from regional to provincial PLs affect the HCRs in a similar way with respect to the use of the national PL

- The change in the values of the HCRs is very small compared to that observed when comparing results obtained using the national PL

- The results suggest that measuring the monetary poverty incidence at provincial level using national or local (regional or provincial) thresholds strongly change the picture of the phenomena

Household poverty incidence at provincial level with Regional PLs (RPLs) and Provincial PLs (PPLs)

Household poverty incidence at provincial level with Regional PLs (RPLs) and Provincial PLs (PPLs)
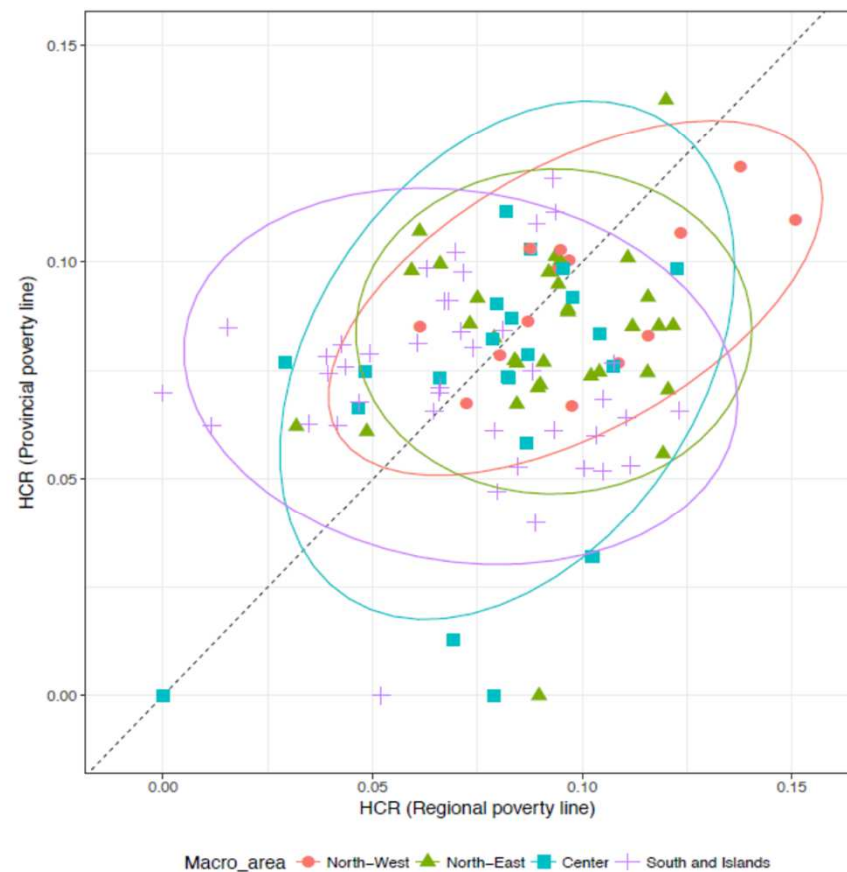
Taking into account local price levels

- As concerns the measurement of relative poverty indicators in real terms, a possible solution is to use Purchasing Power Parities
- To compute local poverty indicators in real terms, PPPs should be computed at sub-national level
- However, sub-national PPPs are usually not available
- PPPs for the Italian regional capital cities were estimated by Istat in 2009
- The PPPs for Italian regional capital cities are of course an approximation to measure the standard of living in Italian regions, and they assume that the level of the prices is constant inside each region
- As a starting point, following the approach by Marchetti and Secondi (2016), we extrapolated the Istat 2009 PPPs to 2012 by using Consumer Price Indexes (CPIs)

Taking into account price levels

- We then consider an alternative set of PPPs computed combining Istat regional PPPs with an index, HC, based on rent costs

- The HC value is computed for each region or province as the ratio of the mean (regional or provincial) monthly expense of the households to rent a house over the corresponding national mean value, using HBS 2012 data

- When computing the HC index for the provinces, a SAE model is needed to estimate the provincial mean monthly expense of the households to rent a house

- We define the new PPPs as $\alpha \cdot PPPs + (1 - \alpha) \cdot HC$

- α is set equal to the share of house rent expenditure on the total consumption expenditure for the households living in a rented house ($\alpha = 0.26$ using HBS data).

Household poverty incidence at provincial level using consumption data adjusted with regional PPPs
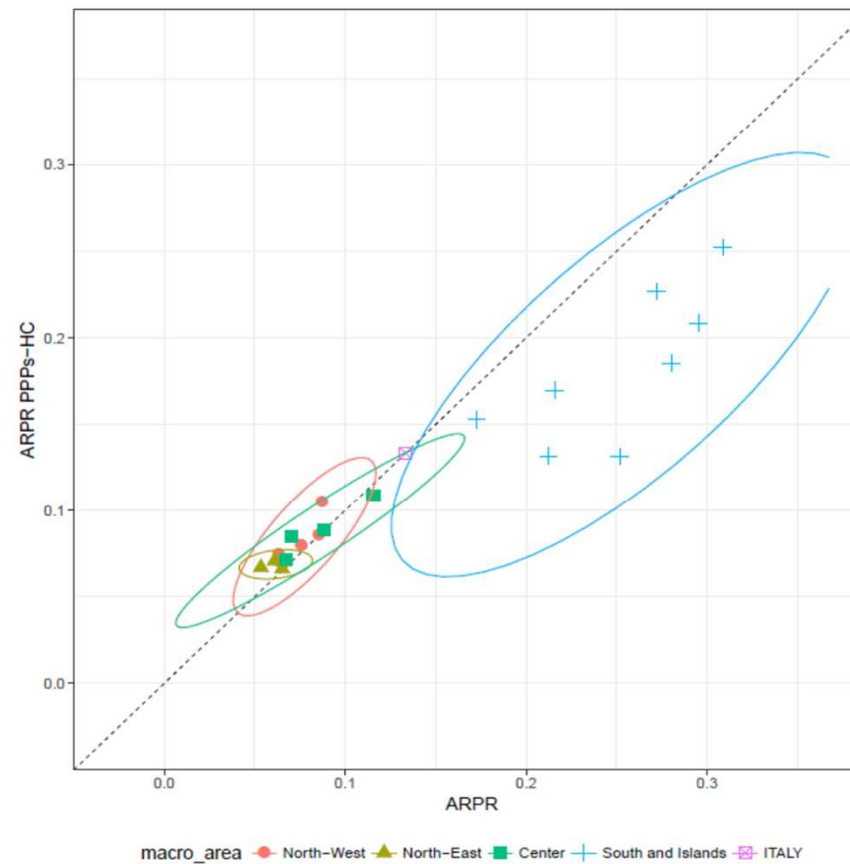
The use of scanner data to estimate local PPPs

- In the MAKSWELL project we want to use different sources of data to estimate local PPPs
- One possibility is to use data on the rent prices coming from administrative registers (Biggeri and Laureti, 2018)
- Another possibility is to use the information on the local level of the prices coming from scanner data to estimate Local PPPs used for estimating spatial price indexes at regional level by Biggeri et al, 2017 and Laureti and Polidoro, 2018
- Poor specific PPPs

The use of scanner data to estimate local PPPs

- Scanner data available to estimate spatial price indexes
- Outlets:
  - Universe of 9,000 retailers belonging to the 16 most important retail chains (95% of modern retail chain distribution).
  - Stratified by province, distribution chains and kind of outlets (888 strata)
  - Outlets are selected with probabilities proportional to the 2016 turnover
  - In total 1,781 outlets (510 hypermarkets and 1,271 supermarkets)
- Items:
  - Grocery products: five divisions of the ECOICOP (01, 02, 05, 09, 12).
  - Scanner data cover 55.4% of the total retail trade distribution for this category of products
  - Items were selected with probabilities proportional to the 2016 turnover for each product aggregate (at 60% cut-off line)

Concluding remarks

- In this work we have presented alternative estimates of the HCR for Italian regions and provinces by using data on households' consumption expenditure

- The aim was to evaluate the impact of subnational PLs on the HCRs and the use of SAE models

- Moreover, we tried to also evaluate the impact of the local level of the prices on the computation of the HCR

- Our results show that the choice of the PL and the use of local PPPs is very relevant when the aim is to compare local relative poverty indicators

- The aim is to extend the present work by using new data sources to compute new local PPPs

- Since scanner data are available at detailed territorial level (municipalities within each Italian provinces) it is possible to compute PPPs for HH at local level.

Thank you!!!!

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