

# 3rd Meeting of the Country Operational Guidelines Task Force

## Sub-national PPPs: Country case studies

*Publications, experiments and projects on the computation of spatial price level differences in Italy*

Luigi Biggeri and Tiziana Laureti\*

*\*The authors thanks D.S.Prasada Rao for reading and commenting on earlier version of this paper*

September 27, 2018

## Outline of the paper

### **1. Introduction**

### **2. Activities carried out by ISTAT to compute Spatial price Indexes (SPIs) in three different domains**

2.1 Sub-national PPPs for household consumption

2.2 Spatial Adjustment Factors

2.3 Absolute Poverty threshold at sub-national level

### **3. Istat projects from 2011 up to now: experiments, main results and future development**

- Review of experiments developed within joint research projects

### **4. Computation of spatial price indexes for dwelling rents**

- First results and future developments

## 2.1 Sub-national spatial price indexes for household consumption computed by Istat

- ❑ Need for compiling sub-national PPPs for **Italy** due to the high socio-economic heterogeneity across its geographical areas
- ❑ The Italian National Statistical Institute (Istat) computed **regional** consumer price level indexes, with specific reference to household consumption, in two experiments, in 2008 and 2010:
  - ➔ **In 2010 (with reference to 2009 data):** all COICOP expenditure divisions; GEKS formula and CPD model for actual rents, CPI data and *ad hoc surveys*
    - **Results:** significant differences in the level of consumer prices across regional capitals; price levels in the Northern regional capital are generally higher than those in the Centre-Southern Italy
  - ➔ ***Used only in academic research***
    - to verify how the household income distribution in Italy is “reshuffled”
    - to carry out “real” comparison of the estimates of the household consumption expenditures and poverty indicators at local level

## 2.2 The computation of the Spatial Adjustment Factors (SAFs)

- ❑ Spatial Adjustment Factors (SAFs) are required by the Eurostat-OECD Program to convert capital city prices to national average prices
- ❑ The methodology used for computing SAFs should be consistent with the approach used by Eurostat in the calculation of PPP.

### Uses:

- ❑ Istat provides Eurostat with SAFs for the regional capital cities by using CPI data only
- ❑ Italian SAFs are not published since they are considered as a “by-product” of the international PPP computation .

## 2.3 Computation of Spatial Price Indexes by using the estimation of the absolute poverty (1/2)

- ❑ Istat publishes official data on absolute poverty (AP) on an annually basis for different family types and geographical areas.
- ❑ They are based on the monetary measurement of a basket of goods and services whose consumption is essential to avoid poverty by providing the same level of utility for each type of family:

$$APT_{jt} = C(q_{1j} \cdot p_{1t}, \dots, q_{ij} \cdot p_{it}, \dots, q_{nj} \cdot p_{nt}; U),$$

where  $i$  ( $i = 1, \dots, i, \dots, n$ ) is the generic product/service,  $j$  ( $j = 1, \dots, j \dots, 38$ ) the type of family, and  $t$  ( $t = 1, \dots, j \dots, 9$ ) the territorial area.

➡ **USES:** APTs may be used for computing binary economic spatial price index (the so-called cost of living index)

$$APT_{j,1} / APT_{j,t} = C(q_{1j} \cdot p_{11}, \dots, q_{ij} \cdot p_{i1}, \dots, q_{nj} \cdot p_{n1}; U) / C(q_{1j} \cdot p_{12}, \dots, q_{ij} \cdot p_{i2}, \dots, q_{nj} \cdot p_{n2}; U) = SPI^{AB}_{jt}$$

## 2.3 Computation of Spatial Price Indexes by using the estimation of the absolute poverty (2/2)

**Table 2 Differences (in %) of the ratio between Absolute Poverty Tresholds in the geographical areas and for typology of Municipalities**

Tip. Comuni*	North/South			Center/ South		
	A	B	C	A	B	C
Max	35,8%	33,8%	34,5%	31,9%	29,3%	29,3%
Min	26,9%	24,8%	24,2%	19,2%	16,6%	15,6%

\*A= Metropolitan area; B= Large municipalities with more than 50.000 inhabitants;  
C= Other municipalities up to 50.000 inhabitants.

- The territorial heterogeneity of implicit prices appears to be significant and higher than the one resulting from the regional parities referred to the year 2009, calculated by Istat for all households

### 3. Istat projects from 2011 up to now: experiments, main results and future development

- Istat have implemented further research studies in cooperation with the University of Florence and the University of Tuscia with the aim of compiling sub-national PPPs. (Biggeri *et al.*, 2017; Laureti and Polidoro, 2017; Laureti *et al.*, 2017; Laureti and Polidoro 2018)
  
- Up to now sub-national PPP results are used by ISTAT for internal purposes to understand the feasibility of producing them on a regular basis by using:
  - CPI data (e.g. for vegetables, fruits and other products sold price per quantity)
  - scanner data (pre-packed products sold in markets of different distributional chains)
  - *ad hoc survey* (i.e. Clothing and footwear).
  - Various methodologies have been tested
  
- **USES:** the computation of sub-national PPPs are included in the Italian National Statistical Program to complete official information on price statistics

### 3.Istat projects from 2011 up to now: experiments, main results and future development

#### Main experiments carried out using scanner data

- Within the ISTAT projects, various interesting experiments have been carried out in the last few years using both scanner and CPI data (Biggeri et al, 2016; Laureti and Polidoro, 2017a; 2017b; Laureti *et al.* 2017; Laureti and Prasada, 2018). The main issues addressed were:
  - Explore the feasibility of using new source of data (scanner data) for computing SPIs
  - Integrate scanner data with traditional data sources for perishables and seasonal products such as vegetables, fruit and meat.
  - Implement various aggregation methods at product level (GK, GEKS, etc)
  - Explore consumer price level differences at **regional, provincial and municipality territorial level** (Laureti and Polidoro, 2018)

## 4. The computation of spatial price indexes for housing dwellings rents (1/4)

- ❑ A research project for computing Spatial Price Indexes for House Rents (SPIHR) has been recently implemented (Biggeri and Laureti)
- ❑ **DATA** produced by the Real Estate Market Observatory (OMI), which is part of the Italian Revenue and Tax Agency.
  - ❖ Since location is the characteristic with the greatest impact on rent value, price quotations refer to **zones**: every Italian municipality is divided into homogeneous zones (OMI zones) having uniformity of economic and socio-environmental conditions which is translated into homogeneity of the market values of the real estate units.
  - ❖ Information on minimum and maximum values for rents in each municipality and OMI zone are provided
- ❑ SPIHRs for different dwelling types are computed, including:
  - i) Residential houses,
  - ii) Economic and Cheap dwelling-houses

## 4. The computation of spatial price indexes for housing dwellings rents (2/4)

The region-product-dummy-method (RPD) method was used

$$\begin{aligned}\ln r_{ij} &= \ln SPIHR_j + \ln R_i + \ln u_{ij} \\ &= \pi_j + \eta_i + v_{ij} \\ &= \sum_{k=1}^M \pi_k D^k + \sum_{i=1}^N \eta_i D^i + v_{ij}\end{aligned}$$

where  $r_{ij}$  is the rent of dwelling  $i$   $D^k$  is a regional capital-dummy variable that takes value equal to 1 if the rent observation is from  $k$ -th regional capital; and  $D^j$  is a OMI area -dummy variable that takes value equal to 1 if the rent observation is for  $j$ -th OMI area ( $i=1, \dots, 310$ ).

## 4. The computation of spatial price indexes for housing dwellings rents (3/4)

**Table 3- Spatial price indexes for house rents (SPIHR)-Italy=100 (Well-finished dwelling-houses and Economic and cheap dwelling-houses)**

	Well-finished dwelling-houses				Economic and cheap dwelling-houses			
	Minimum rent		Maximum rent		Minimum rent		Maximum rent	
	SPIHR	Std. Err.	SPIHR	Std. Err.	SPIHR	Std. Err.	SPIHR	Std. Err.
<b>North</b>								
Piemonte	87.20	0.00704	89.14	0.00702	97.33	0.00825	101.33	0.00808
Valle d'Aosta	123.14	0.03357	121.09	0.03345	122.78	0.03782	117.57	0.03705
Liguria	142.81	0.01267	140.29	0.01263	158.18	0.01289	159.93	0.01262
Lombardia	117.39	0.00545	114.14	0.00543	133.61	0.00718	127.87	0.00704
Trentino-Alto Adige	153.00	0.00988	147.37	0.00985	213.32	0.18653	200.24	0.18275
Friuli-Venezia Giulia	100.01	0.01424	106.85	0.01419	101.78	0.01686	110.86	0.01652
Veneto	115.04	0.01147	112.02	0.01143	135.38	0.02278	127.14	0.02232
Emilia-Romagna	117.16	0.01088	116.07	0.01084	126.20	0.01300	124.35	0.01274
<b>Centre</b>								
Toscana	141.74	0.01058	143.49	0.01054	151.72	0.01358	150.02	0.01331
Lazio	124.43	0.01169	123.37	0.01165	141.01	0.01616	142.56	0.01583
Umbria	88.89	0.02045	90.49	0.02038	95.66	0.02640	95.25	0.02586
Marche	104.96	0.01202	105.97	0.01198	110.22	0.01321	108.98	0.01294
<b>South</b>								
Abruzzo	75.30	0.01293	80.55	0.01288	79.29	0.01288	84.10	0.01262
Molise	66.60	0.03524	73.38	0.03511	70.03	0.03554	75.85	0.03482
Campania	78.49	0.00782	78.03	0.00780	84.94	0.00792	83.66	0.00776
Basilicata	58.61	0.01815	57.32	0.01808	51.66	0.01875	51.16	0.01837
Puglia	81.94	0.01345	81.16	0.01340	90.63	0.01318	87.45	0.01291
Calabria	62.34	0.01273	62.82	0.01268	70.80	0.01138	70.55	0.01115
Sicilia	68.37	0.01080	71.41	0.01076	67.30	0.00959	69.26	0.00940
Sardegna	80.05	0.01416	80.94	0.01411	87.09	0.01747	86.03	0.01711

## 4. The computation of spatial price indexes for housing dwellings rents (4/4)

- ❑ Results show significant rent level differences across the various Italian regions and support the notion that dwelling rents are higher in the Northern-Central regions (such as Liguria, Trentino-Alto Adige, Toscana and Lazio) than in the South (Basilicata, Sicily), with the exception of Piemonte and Friuli-Venezia Giulia.
- ❑ To explore spatial heterogeneity in housing rents within Italian regions RDP models are estimated by considering Italian provinces. Results show a high degree of heterogeneity in spatial price indexes for house rents within Italian regions.
- ➡ **USES:** researchers belonging to the Dagum centre will use **SPIHRs** for obtaining comparable “real” salaries in the Italian provinces and for designing policy interventions for housing