THE COMPUTATION OF POVERTY SPECIFIC SUB-NATIONAL PPPS FOR HOUSEHOLDS BY USING THE NEW ESTIMATIONS OF ABSOLUTE POVERTY THRESHOLDS PRODUCED BY ISTAT IN 2023

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Abstract. Regional differences in price levels and cost of living have an important impact on the territorial approach to the design and implementation of policies to contrast poverty. Given the regional absolute poverty thresholds produced and published by Istat (Italian National Institute of Statistics) in October 2023, the goal being to evaluate regional differences in prices for the poor, implicit in the thresholds. The long-term goal is to estimate poverty-specific sub-national PPPs. In this paper we present the methodology and the first analysis of the results of the computation of bilateral spatial price indexes for poor households in Italian regions. Methodology and processes can be explored, improved and used in the coming years.

1. Introduction

The estimation of absolute poverty thresholds at a sub-national level is very important both to estimate the number of poor people in various areas and to verify whether there are differences in price levels between these areas[1]. In fact, any regional differences in prices have an important impact on the design and implementation of policies for poverty reduction, at national and local levels (Bishop *et al.*, 2017; Biggeri and Pratesi, 2017).

In 2018, in an article on the adjustment of economic poverty measures to take into account the cost of living, we proposed to evaluate these differences by using the absolute poverty thresholds (Biggeri and Pratesi, 2018). Since 2005 Istat (the Italian National Institute of Statistics) has been estimating absolute poverty and absolute poverty thresholds by geographic area, North, Center and South (Istat, 2009)[2] and we calculated, for the year 2016, the differences in price levels for the three macro areas by type of municipality, obtaining interesting results. Simple

[1] The importance of absolute poverty (ABSPO) estimates in order to highlight the general level of prices and the differences between areas was also underlined in a technical report of the Joint Research Center of the European Commission (Menyhért *et al.*, 2021). The report also notes that the lack of comparable data for ABSPO in different European countries is an important limitation.

[2] For a summary of the definitions and methodology used, in English, see Istat (2022).

specific spatial indices for the poor were implicitly obtained, that could be more adequate for comparing poverty indicators[3].

Recently, in October 2023, Istat produced and published estimates of absolute poverty thresholds for the 20 Italian Regions with reference to the private households resident in Italy (Istat, 2023). We renew our proposal to use the data referred to 2022 to estimate poverty-specific spatial price indices to evaluate the differences in prices between the various Italian regions. The long-term goal is to estimate Poverty Specific Sub-national PPPs , but, as we will see later, at the moment there are many limitations to estimating them. Therefore, in this paper, we present the computation of bilateral spatial price indexes clarifying the meaning that can be attributed to them.

The paper is organized as follows. In section 2, the characteristics (definitions and methodology) of the new estimates of absolute poverty and absolute poverty thresholds carried out by Istat are presented. Section 3 has three objectives: i) to illustrate the basic methodology to compute synthetic spatial price indices (PPPs); ii) to underline that with data currently available it is possible to compute only spatial price bilateral indices; iii) to clarify the meaning that can be attributed to them. Section 4 specifies which bilateral price indices have been computed and presents a short analysis of the main results. Finally, in section 5 we illustrate the main conclusions and suggest a roadmap for further research.

2. The New Estimation of Absolute Poverty carried out by Istat in 2023

In 2023, Istat published a report on the new estimates of absolute poverty carried out for the year 2022 (Istat, 2023b)[4].

The *measure of Absolute Poverty* (AP) is based on the monetary evaluation of a basket of goods and services considered essential to avoid serious forms of social exclusion.

The reference unit of the basket is the household, considered in relation to the characteristics of its individual members, their specific needs (for example, for nutritional needs) and any economies of scale or forms of savings that can be

[3] On the need to use spatial price indices to correctly compare poverty indicators, see Deaton (2005); Deaton and Dupriez (2011).

[4] The new estimates were developed on the basis of the update of the estimation methodology defined within a specific national Study Commission appointed in December 2021, chaired by the president of Istat and which includes representatives of the academia, the Bank of Italy, experts of various bodies and Istat (Istat, 2023b). The Commission began meetings in January 2022 with continued assistance for processing and experiments by Istat's researchers. We must applaud the Istat researchers for the enormous work carried out with high competence and efficiency and in good time having published the data on absolute poverty in the month of October 2023.

achieved when the family composition varies. The essential needs have been identified in adequate nutrition, in the availability of a dwelling of size appropriate to the size of the household, heated, equipped with the main services, durable goods and accessories and in the minimum necessary to dress, communicate, get informed, move around the territory, educate and maintain good health. The basket is divided and composed into three macro components: food, housing and residual components. The monetary value of the overall basket is obtained by direct summing the values of the various components.

The *Absolute Poverty Basket* (APB) is the set of good and services considered essential to assure a minimum life-standard to an Italian household with certain characteristics. The definition of the Absolute Poverty Baskets (APBs) is the starting point for the process of constructing and evaluating Absolute Poverty Thresholds (APTs), which is outlined below. (see Istat, 2023b; Cutillo *et al.*, 2022).

The first step is the identification of individual and household essential requirements, referring to the idea of an acceptable minimum standard of living: a household that cannot afford to purchase goods and services essential to meet these basic requirements (or needs) cannot attain an acceptable standard of living, although modest, in the social context in which it lives. The second step is the identification, for each essential requirement, of specific goods and services to be included in the basket summarizing basic needs. The third step is the identification of the sources for evaluating the costs of goods and services in the basket. Finally, the fourth step concerns the final definition of the thresholds, i.e. the minimum value of economic resources necessary to a household so as not to be defined as absolutely poor.

The *Absolute Poverty Thresholds* (APTs) represent the minimum expenditure necessary to purchase the goods and services included in the basket of absolute poverty. Absolute poverty thresholds vary, by construction, according to the size of household, the age of its components, the area of residence and the size of the municipality of residence.

In fact, the APTs are classified by:

a) Size and age of the components of the household; the reference age classes are 7 (0-3, 4-10, 11-17, 18-29, 30-59, 60-74, 75 and over). An Equivalence scale is taken into account in order to compare household consumption expenditure when dealing with different-size households.
b) Area of residence: 20 regions.
c) Demographic size of the municipality of residence in the Region: Istat identified three groups of municipalities: Center municipalities of a metropolitan area, Suburb municipalities of a metropolitan area and municipalities with 50,001 inhabitants and above, Other municipalities up to 50,000 inhabitants.

Therefore, it is not a single threshold, but as many absolute poverty thresholds as the combination of the above-mentioned criteria of classification.

In the following, we recall the definitions used to construct the poverty thresholds.

2.1. Monetary estimation of the absolute poverty baskets and thresholds

The criteria used to assess the monetary value of the absolute poverty basket are different for the three macro components of the basket: Food, Housing and Residual.

(i) Food: definition of minimum needs and prices used

- the number of foods considered is 96); the daily needs are based on the recommended intake levels of nutrients evaluated by the CREA Italian Research Centers, Food and Nutrition.
- the monetary value is calculated on the basis of a minimum average price obtained as a weighted arithmetic mean of the minimum prices charged in the various types of distribution channels at provincial and regional level (considering only the prices belonging to the lower tail of the distribution, first quintile). That is the minimum price accessible to all households, taking into account the characteristics of the offer in the different territorial realities.

(ii) Housing definition of minimum needs and prices used

- housing needs which refers to the availability of a dwelling of adequate size according to household size and equipped with heating and main services, durable goods and accessories;
- The housing minimum requirement is defined through a ministerial decree, which establishes parameters for granting the habitability (Ministerial Decree 5/7/1975).
- Housing needs are classified by size of the house in square meters (m^2) based on household size (components: 1 = 32.5 m^2; 2 = 39.5 m^2; 3 = 46.0 m^2; 4 = 58 m^2; 10 m^2 additional for each additional component);
- The monetary value of rents is computed in euros per square meter using the database of all real estate rentals from the Revenue Agency. Only economic types of homes were considered, using data by surface classes, type of municipalities and region.
- Electricity, hot water and gas: the minimum need is based on the spending of the households with essential energy consumption.
- Heating: the minimum requirement is established on the basis of European legislation on the matter, based on the climate zone and the time of

construction and the type of home; the monetary value is obtained on the base of unit prices from Arera (Energy Agency)/Istat

(iii) Residual Component

The costs of textbooks and tuition fees for primary and secondary schools were directly assessed.

For the remaining goods and services consumed - i.e.: for clothing and footwear, communications, transport, education, healthcare - the value of the expenses was direct estimated with a linear regression model with intercept that relates household expenditure on food and non-alcoholic beverages to spending on all goods and services considered in the residual component. It takes into account the effect of the household members' number and age composition and the impact of savings/non-savings behavior.

Essentially, the monetary evaluation of poverty baskets was carried out starting from the *hypothesis that primary needs of goods and services that meet each type of households are homogeneous across the country* (except that for energy and heating).

The cost for the basket of goods and services of absolute poverty and thresholds for each type of household at a territorial level is obtained using the prices existing in the various areas of the country at a provincial and regional level. Therefore, the expenditure for each type of household in the different regions will be different in relation to any different price level.

At the end of the monetary evaluation process described, the value of the different *Absolute Poverty Thresholds (APT) is expressed in euros per month*. Since, as mentioned, the APTs vary by construction, according to the type of household, by region and by size of the municipality, Istat has published the absolute poverty thresholds for the 20 Italian regions and for the 3 types of municipalities, for 50 typologies of households[5].

On the basis of the thresholds, Istat computes:

- *Households Absolute Poverty*: Households with a monthly expenditure equal to or less than the value of the absolute poverty thresholds are classified as absolutely poor.
- *Number of absolutely poor:* The estimate of the number of absolute poor must therefore refer to the expenses incurred by household resident in Italy. This is captured through the Household Budget Survey (HBS) which aims to

[5] The absolute poverty thresholds can and have been calculated regardless of whether a certain type of household is present in the area taken into consideration. In this case we are dealing with virtual thresholds, in the sense that the threshold represents the expenditure below which the household of that type would have been considered in absolute poverty if it had been present in that territory.

measure the structure and the level of consumption expenditure according to the main social, economic and territorial characteristics of resident households (Istat, 2023a).

Istat, using these estimates and information on absolute poverty thresholds, estimates the *Incidence of Absolute Poverty* and the *Intensity of Absolute Poverty*.

3. The theoretical basis for calculating poverty-specific spatial sub-national price indices using absolute poverty thresholds: meaning, issues, and challenges

3.1. The theoretical basis

The APTs computed and published by Istat can be used to appreciate the differences in the levels of prices that the poor households find in the markets of the three types of municipalities within the 20 Italian regions, and then, to calculate poverty-specific sub-national Spatial Price Indexes (SPIs).

The assumption is that the primary needs of each type of households, and the baskets of goods and services that satisfy them, are homogeneous throughout the national territory, and represented by this notation q_{i*}^{j} where j is the type of household, i is the product/service and $*$ it means that the quantities are the same throughout the national territory for the type of household j. The approach is the same used by the International Comparison (ICP) of the World Bank to compute the Purchasing Power Parities (Rao, 2013a; Rao, 2013b; World Bank, 2013; Biggeri and Rao, 2021; Laureti and Rao, 2018).

As explained in section 2, the Absolute Poverty Thresholds (APTs) are based on the monetary assessment of the Absolute Poverty Baskets (APBs). The basket is the same in each territorial area and the threshold is obtained applying the average price of the "minimum" market price to each item of the same basket, purchased in the place where the household lives. Given the basket, the assessment is done applying p_{ik}, the average of the "minimum" prices of the product i in the region k, to each item.

The hypothesis of national homogeneity of baskets applies for each type of households, when defined by the number of the components and their age.

The thresholds of each type of household are comparable among the regions because they are based on a basket of identical products and services with the same, or similar, quality. In other words, given the same basket to satisfy the same primary needs, the ratio between two APTs, reflects solely differences in price levels and originates a Spatial Price Index (SPIs). If the above hypotheses are not verified, caution must be exercised in interpreting the results of the calculated SPIs.

More formally, let *i (i = 1,…, i,…N)* be the generic product/ service, *j (j = 1, ..., j, ..., F)* be the type of household, *k (k = 1, ..., k, ..., R)* the regions, and p_{ik} an average of the minimum prices of the product *i* in the region *k*, it is then possible to define a generic poverty threshold (APTs) with respect to the type of household j, and region k as follows:

$$\text{APT}_k^j = C\left(p_{1k}, p_{2k}, \ldots, p_{1Nk};\ U^j\right) \tag{1}$$

where *C* is a cost function which represents the minimum expenditure necessary to attain a given utility level U^j at prices prevailing in a territorial area.

The assumption that the poverty threshold computed by Istat equals this minimum expenditure allows us to write that

$$\text{APT}_k^j = C\left(p_{1k}, p_{2k}, \ldots, p_{1Nk};\ U^j\right) = \sum_{i=1}^{N} p_{ik}\, q_{i*}^j \tag{2}$$

The $\text{APT}^j{}_k$ can be calculated for each type of household and each of the R regions or territorial areas.

The relationship between poverty thresholds referring to the household type in different regions is clear and allows computing SPIs.

For example:

$$\text{SPI}_{rk}^j = \frac{C\left(p_{1k}, p_{2k}, \ldots, p_{1Nk};\ U^j\right)}{C\left(p_{1r}, p_{2r}, \ldots, p_{1Nr};\ U^j\right)} = \frac{APT_k^j}{APT_r^j} = \frac{\sum_{i=1}^{N} p_{ik} q_{i*}^j}{\sum_{i=1}^{N} p_{ir} q_{i*}^j} \qquad \text{for all regions } r \text{ and } k \tag{3}$$

provides a *Laspeyres-type bilateral spatial price index* (the so-called cost of living index) as it compares the cost paid by each type of household *j* residing in region *k* and region *r* to buy a fixed minimum basket of goods and services that provides the same level of satisfaction/utility.

These indexes can be obtained for all types of households and territories for which the poverty thresholds are calculated.

In the case of spatial comparisons, comparisons between all pairs of regions are of interest and, therefore, the main aim is to obtain the price index matrix for each type of household *j*, where $\text{SPI}^j{}_{rk}$ measures the price level for the *j*-th household in region *k* relative to the base region *r*.

It is obvious that the indices in the main diagonal of that matrix are equal to 1, and that the indices below the main diagonal are the reciprocal of those found above the main diagonal.

The values greater than 1 indicate that the price level in a region is higher than in the base region.

3.2. Meaning, issues, and challenges

With regard to the meaning of SPI^{j}_{rk}, it must be noted that the *hypothesis that primary needs of goods and services of each type of households are homogeneous across the country* (except for the very few exceptions noted in Section 2) is a bit strong, but it should be valid for a fairly large group of territories. If we believe that there are important differences between regions and types of municipalities, it is obvious that in such cases it is necessary to be very careful in interpreting the results of the SPI^{j}_{rk}.

Another problem of interpretation may arise if we take into account that, generally, for the monetary evaluation of the absolute poverty basket (APBs), the minimum prices of the various types of distribution channels at provincial and regional levels, that is at the minimum price accessible to all households, are used. These are not necessarily the prices paid by absolutely poor households. To improve the adequacy of the poor-specific SPI^{j}_{k} it is necessary to know the consumption behavior of poor households at territorial level (possibly at provincial level) and their behavior in order to choose the cheaper products: in other words, we should individuate the markets of the poor. A first tentative survey and analysis has been conducted at national level by Istat (Biggeri and Pratesi, 2022). This line of research was aimed at improving the estimation of the actual prices paid by the poor households in different Italian geographical areas by taking into account their different behaviour in the choice of the outlet where purchase large consumption products. It is certainly a first attempt to individuate the markets of the poor, but further research is needed on this.

Since the final objective is the estimation of multilateral poverty-specific spatial price indices per region (PPP_k), it is obvious that the calculation of the SPI^{j}_{rk} is only a first step of the path that must be followed to arrive at the aforementioned indices.

Anyway, this first step is very useful for analyzing the variability of SPI^{j}_{rk} between and by type of household and by type of municipalities within the region. This will be done in Section 4.

Usually, various issues are encountered in the path to arrive at the estimation of the synthetic indices SPI_k, that is PPP_k (see: Rao, 2013a; Rao, 2013b; World Bank, 2013; Biggeri and Rao, 2021; Laureti and Rao, 2018).

Firstly, it may happen that data in some cells of the SPI^{j}_{rk} index array is missing. In this case it is necessary to resort to imputation methods, the most used of which is the Country Product Dummy Method (CPD) (Rao, 2013b). However, this situation in the APT^{j}_{k} data does not occur.

Secondly, by construction APT^{j}_{k}, and consequently also SPI^{j}_{rk}, are calculated separately for each of the three types of municipalities. Therefore, to obtain the synthetics regional indices it would be necessary to calculate their weighted

arithmetic mean having available the weights represented by the expenses made up by each type of household in the three types of municipalities. These data cannot be obtained from the HBS sample, because of its insufficient sample size. Perhaps the number of each type of household residing in the three types of municipalities could be used as a substitute indicator (even if approximate).

Thirdly, it would be necessary to aggregate the synthetic regional indices relating to the types of households to obtain the multilateral indices SPI_k that satisfy the transitivity property. The operation is a bit complex and can be carried out by applying various methods including the so-called Region-Product-Dummy (RPD) method, that is the regional version of the CPD (Laureti and Rao, 2018; Biggeri and Rao, 2021). Also in this case, the availability of weight indicators for individual types of households would be important.

4. Computation of the poverty-specific bilateral spatial (regional) price indices for type of municipality and type of households: a brief analysis of the main results for 2022

As anticipated in the previous section, we present here the results of a preliminary analysis of the behavior of the bilateral spatial price indices to highlight their variability by type of households within the Italian regions.

The regional poverty thresholds data are downloadable from https://www.istat.it/it/archivio/289724 (accessed in January 2023).

Because of the construction process, the APT^j_k, and consequently also the SPI^j_{rk}, are firstly calculated separately for each of the three types of municipalities.

We must observe that only eleven of the twenty regions host "Center-municipalities of a metropolitan area"; "Suburb municipalities of a metropolitan area and municipalities with 50,001 inhabitants and above" are present in eighteen regions (Regions Aosta Valley and Molise are missing because they do not have municipalities with more than 50,001 inhabitants and above); while "Other Municipalities up to 50,000 inhabitants" are present in all the twenty Italian regions. Therefore, the results of our computations are presented separately for each type of municipality.

To make the presentation of the indices simpler and facilitate comparisons, we use the Tuscany region as the r base, and therefore the values for Tuscany are equal to one for the various indices (Tuscany = 1)[6].

Taking into account our aim, we decided to do the computation of the SPI^j_{rk} only for some types of households considering their presumed frequency and, above all,

[6] The researchers could change the reference region, as they prefer.

their possible socio-economic fragility:(i) households with one member aged 18-29 years ("young singles"); (ii) households with one member aged 75 years and over ("elderly singles"); (iii) households with 1 member aged 11- 17years and 2 members aged 30-59 ("traditional households"); (iv) households with one member aged 0-3 years; two members aged 4-10 years and two members aged 30-59 years; taking into account that Istat (2023a) said that the most marked discomfort is observed for the households with three minors o more ("households with three minors").

4.1. Main general results

4.1.1. Center municipalities of a metropolitan area

As it can be seen from Table 1, the values of the SPI^{j}_{rk} indices confirm the general idea that in Northern Italy, level of prices at which absolutely poor households can make purchases is higher than in the regions of Central and, especially, Southern Italy.

Table 1 – *Center Municipality of a Metropolitan Area - Spatial Price Indices by Region (k) and Typology of Households (j)* SPI^{j}_{rk} *- r is Tuscany = 1.*

Regions	Type of Households				
	1m. 18-29	2m. 18-29	1m. 11-17 2m. 30-59	1m. 0-3 2m. 4-10 2m. 30-59	1m. 75 +
Piedmont	0.84	0.84	0.85	0.87	0.83
Lombardy	1.11	1.10	1.10	1.11	1.03
Veneto	1.00	0.99	1.00	1.00	0.93
Liguria	0.85	0.87	0.72	0.87	0.91
Emilia-Romagna	1.08	1.06	1.05	1.05	1.03
Lazio	0,98	0.99	1.32	1.11	0.92
Campania	0.74	0.69	0.78	0.84	0.56
Apulia	0.74	0.74	0.76	0.81	0.64
Sicily	0.74	0.72	0.77	0.80	0.61
Sardinia	0.83	0.90	0.90	0.90	0.81

Note: The typology of the household is indicated by first providing the number of members and, secondly, the age class to which they belong (i.e. 1 m. 18-29, a member aged 18-29 years).

Generally, prices are higher in the Center municipality of the metropolitan area of Milan (Lombardy) and depending on the type of household, they exceed the prices

of the southern region by a percentage that varies within a range approximately from 40% to 80%. In Lazio (Rome), Campania (Naples), Apulia (Bari) and Sicily (Palermo, Catania and Messina) the households with three minors have to bear higher prices than other types of households, probably for the type of goods and services they need.

A peculiarity worth mentioning: Sardinia (Cagliari) has price levels that are always quite higher (about 12-13%) than the other southern regions for all types of households.

With reference to *elderly singles* - households with one member aged 75 years and over - the highest price level is still found in Lombardy. In Campania prices found by these older persons are 84% lower. In Sardinia the price level is 43% higher than Campania, 33% higher than Sicily, and 27% higher than Apulia.

The *traditional households* with 1 member aged 11-17 years old and 2 members aged between 30 and 59 years old - find smaller differences in price levels in Northern and Southern center-municipalities of metropolitan areas than the type of households mentioned above. The same happen for the *households with three minors*.

A more extensive diffusion of local markets, that usually offer lower prices, can contribute to explain price differences. In southern areas, we expect also lower expenses for housing than in the north.

Estimating the poverty thresholds separately for the Food and for the Housing components - operation that we strongly recommend - would make it possible to clarify the reasons for the differences in prices illustrated above.

4.1.2. Suburb municipalities of a metropolitan area and municipalities with 50,001 inhabitants and above

Even in this type of areas, the level of the prices at which absolutely poor households can make purchases is higher in Northern Italy than in the regions of Central and, especially, Southern Italy (see Table 2). But the differences are a little bit lower. While in Sardinia the price levels for all types of households are always quite higher than in the other southern regions, in Umbria the level of the prices is the lowest in all the central regions, regardless of the type of household.

Generally, prices are higher in Lombardy, but often also in Trentino-Alto Adige and Friuli-Venezia Giulia (where there are no metropolitan areas or cities) and Veneto and Liguria.

In the southern regions the prices of the products and services available are lower in a range from 30-35% to almost 70% depending on the type of households.

However, it must be noted that the specific bilateral comparisons between the prices charged in the regions are, in our opinion, difficult to interpret because they

are influenced by the heterogeneity between the suburb areas of the metropolitan areas and the municipalities with more than 50,000 inhabitants and by the weight in terms of population that these two components have in each region[7].

Table 2 – *Suburb municipality of a metropolitan area and municipality with 50,001 inhabitants and above - Spatial Price Indices by Region (k) and Typology of Households (j) SPI^{j}_{rk} - r is Tuscany = 1.*

Regions	Type of Households				
	1m. 18-29	2m. 18-29	1m. 11-17 2m. 30-59	1m. 0-3 2m. 4-10 2m. 30-59	1m. 75 +
Piedmont	0.91	0.90	0.92	0.93	0.90
Lombardy	1.08	1.05	1.06	1.07	0.99
Trentino-Alto Adige	1.15	1.06	1.09	1.13	0.97
FriuliVenezia-Giulia	0.98	0.97	0.99	1.00	0.98
Veneto	1.08	1.04	1.03	1.04	1.00
Liguria	0.98	0.98	0.81	0.97	1.04
Emilia-Romagna	1.06	1.06	1.06	1.07	1.01
Umbria	0.84	0.84	0.89	0.94	0.84
Marche	0.96	0.93	0.97	0.98	0.92
Lazio	0.92	0.93	0.96	0.93	0.85
Abruzzo	0.85	0.83	0.88	0.91	0.79
Campania	0.82	0.73	0.82	0.86	0.62
Apulia	0.79	0.72	0.79	0.82	0.67
Basilicata	0.83	0.77	0.85	0.86	0.72
Calabria	0.83	0.76	0.83	0.86	0.69
Sicily	0.81	0.74	0.82	0.85	0.67
Sardinia	0.85	0.88	0.93	0.93	0.82

Note: The typology of the household is indicated by first providing the number of members and, secondly, the age class to which they belong (i.e. 1 m. 18-29, a member aged 18-29 years).

[7] In 2009, Istat classification of municipalities used in measures of absolute poverty identified only Metropolitan Areas, Large Municipalities and Small Municipalities (Istat, 2009). In 2015, studying also "the new geography of local systems" the classification was changed and the relationships between the centers of the metropolitan areas and their suburbs were extensively analyzed. The classification of municipalities sorted out three classes mentioned in the text. In 2022 this classification was maintained to ensure the comparability with previous absolute poverty estimates. However, the homogeneity of the level of prices in municipalities of class "Suburb-municipalities of a metropolitan area and municipalities with 50,001 inhabitants and above", has not yet been extensively tested.

4.1.3. Other Municipalities up to 50,000 inhabitants

Also in this type of areas, in Northern Italy the level of the prices at which absolutely poor households can make purchases is higher than in the regions of Central and, especially, Southern Italy. But the differences are a little bit lower. In these areas, the peculiarity of Sardinia - where the price levels are always quite higher than in the other southern regions for all types of households - is still evident. In Umbria a lower level of prices is confirmed when compared to all the other central regions, even if not for all the type of household.

Table 3 – *Municipality up to 50,000 inhabitants - Spatial Price Indices by Region (k) and Typology of Households (j) SPI^{j}_{rk} - r is Tuscany = 1.*

Regions	Type of Households						
	1m. 18-29	1m. 30-59	2m. 18-29	1m. 11-17 2m. 30-59	1m. 0-3 2m. 4-10 2m. 30-59	1m. 60-74	1m. 75 +
Aosta Valley	1,09	1.06	1.09	1.10	1.10	1.06	1.01
Piedmont	0.96	0.94	0.96	0.95	0.95	0.96	0.94
Lombardy	1.10	1.08	1.10	1.09	1.08	1.03	1.00
Trentino-Alto Adige	1.19	1.09	1.16	1.14	1.16	1.04	0.99
Friuli Venezia-Giulia	1.04	1.04	1.08	1.05	1.04	1.05	1.05
Veneto	1.08	1.04	1.08	1.06	1.05	1.03	0.99
Liguria	1.06	1.05	1.07	0.87	1.04	1.10	1.12
Emilia-Romagna	1.10	1.10	1.10	1.10	1.09	1.06	1.05
Umbria	0.91	0.94	0.95	0.94	0.94	0.91	0.91
Marche	0.98	0.99	1.00	0.99	0.99	0.96	0.95
Lazio	0.93	0.97	0.97	0.97	1.00	0.90	0.86
Abruzzo	0.86	0.91	0.93	0.91	0.93	0.85	0.81
Molise	0.81	0.81	0.86	0.81	0.85	0.80	0.75
Campania	0.86	0.85	0.86	0.85	0.88	0.73	0.65
Apulia	0.83	0.83	0.83	0.83	0.85	0.76	0.79
Basilicata	0.80	0.81	0.81	0.81	0.82	0.75	0.68
Calabria	0.81	0.85	0.86	0.85	0.88	0.75	0.67
Sicily	0.85	0.85	0.85	0.85	0.87	0.77	0.69
Sardinia	0.91	0.96	0.97	0.96	0.94	0.95	0.88

Note: The typology of the household is indicated by first providing the number of members and, secondly, the age class to which they belong (i.e. 1 m. 18-29, a member aged 18-29 years).

Generally, prices are higher in Trentino-Alto Adige (may be for the presence of many touristic municipalities), but often also in Liguria, Lombardy and Emilia-Romagna.

In the southern regions the prices of the products and services available are lower in a range from 30-35% to more than 70% depending on the type of household.

The highest price level for *young singles* households with one member aged 18-29 is found in Trentino-Alto Adige. In Campania prices are 37% lower; in Sicily 39%, in Apulia 42%, in Calabria 46% and the lowest is in Basilicata: 48%. In Sardinia the price level is only between 5% and 14% higher than in other southern regions.

With reference to *elderly singles* - households with one member aged 75 years and over - the highest price level is found in Liguria (may be for the presence of many touristic municipalities). In Campania prices found by these older single persons are 73% lower, while in Calabria are 69% lower and in Basilicata 64%, in Sicily 62% and in Apulia 59%. In Sardinia the price level is 35% higher than Campania, 31% higher than Calabria, 26% higher than Sicily, and 24% higher than Apulia.

The *traditional households*, with 1 member aged 11-17 years old and 2 members aged between 30 and 59 years old, find the highest level of prices in Trentino-Alto Adige. In the southern regions the price level is lower, but less than for the two previous types of households. In Basilicata prices found by these types of households are 40% lower, but in Apulia, Calabria, Sicily and Campania are respectively, 36%, 34%, 33%, and 32% lower. In Sardinia the level of prices is only 18% lower than in Trentino-Alto Adige. The same happens for the households with three minors.

5. Concluding remarks: suggestion of a roadmap for further research

The analysis of the computed bilateral spatial price indices presented in the previous section has been surely useful, confirming, among other things, that in Northern Italy the level of prices at which absolutely poor households can make purchases is higher than that the same type of households finds in the regions of Central and, especially, Southern Italy.

The spatial indices related to the different types of families did not show significant differences. However, as we have pointed out, some differences and values are notable and allow for interesting considerations.

However further research is necessary both to improve the meaning and interpretation of the bilateral indices and, above all, to achieve the final objective that is the estimate of multilateral poverty-specific spatial price indices per region (PPPs).

To achieve the first goal we should: (i) test thoroughly the hypothesis that primary needs of goods and services of each type of households are homogeneous across the country; (ii) improve the knowledge of the consumption behavior of poor households in order to choose the cheaper products at territorial level, identifying in which shops and markets they buy the various products; (iii) calculate the Absolute Poverty Thresholds separately for the areas of Suburb municipalities of a metropolitan area and for the municipalities with 50,001 inhabitants and above; (iv) calculate separately the specific Absolute Poverty Thresholds for the food component and for the housing component of the Absolute Poverty Basket (and consequently the specific indices of bilateral spatial prices).

For what concerns the second goal, we have indicated in Section 3 the path and all the steps and activities to be implemented.

The further research activities indicated above require a significant effort, but we are confident that the researchers from Istat and our universities will work hard to ensure that these dreams (visions) are transformed into reality.

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