On the Interpretation of the Purchasing Power Parities

Sulla interpretazione delle parità del potere di acquisto

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1. PPPs interpretation difficulties: comparability and representativity

Purchasing Power Parities (PPPs) are used for a wide variety of purposes, including international comparisons of Gross Domestic Product and living conditions in different countries or geographical areas. It is worth emphasizing that the purpose of the index affects both the underlying concepts, definitions and procedures of construction. Recently the revised PPPs data, published by the International Comparison Program (ICP), have led to the forefront some criticisms. In this context, it is evident the key role of the product selection and the price data quality, whose solutions may introduce inaccuracies into the measurement and may affect the reliability of the final results.

One of the criticisms depends on the conflict between the two most important principles in price selection for spatial comparisons, that is representativeness and comparability, as it has been widely recognized, for example by Rao (2001) and in the works of Castels, Locker and Heston, quoted in Rao. The severity of this conflict depends on the strictness of the definition of each product and service within a Basic Heading (BH). Strict comparability of products, obtained through a detailed specification, as adopted by the ICP (there should be no differences in either the quality or quantity of the specifications selected among countries), will lower the degree of representativeness of a given product in different countries. When the representativeness of one country is low the interpretation of the corresponding PPPs becomes controversial.

2. A method for measuring the factors that affect PPPs interpretation

Considering a binary comparison between two countries, A and B, Figure 1 reveals the mismatch between comparability and representativeness.

Figure 1 Comparability versus Representativeness

In the diagrammatic representation 1a) the two principles are perfectly well-matched.
In this case, extending the pioneering work of Kravis, the spatial index can be built up as a ratio of weighted geometric means of prices of corresponding items, called *Average Prices’ Parity (APP)*, from which it is possible to obtain an interesting decomposition:

\[
APP_{A,B} = \prod_{j=1}^{N} \left( \frac{w_j^A}{w_j^B} \right)^{P_j^A} \cdot \prod_{j=1}^{N} \left( \frac{P_j^B}{P_j^A} \right)^{\delta_j^{A,B}}
\]

where \( P_j^A \) (\( w_j^A \)) denotes the price (weight) of item specification \( j \) in country A and \( P_j^B \) (\( w_j^B \)) the price (weight) of item specification \( j \) in country B and \( \sum_{j=1}^{N} w_j^A = \sum_{j=1}^{N} w_j^B = 1 \). The first product on the right hand side of (1) represents the *pure price effect*, corresponding to the classical bilateral PPP, while the second product refers to the *structural effect (SE)*. This effect, which is related to the difference in consumption structures, expressed by \( \delta_j^{A,B} = (w_j^A - w_j^B) \), can be decomposed in \( SE = N \cdot s_{log} \cdot s_{\delta^{A,B}} \cdot R_{log} \cdot s_{\delta^{A,B}} \), thus providing interesting information on its characteristics. It is worth emphasizing that, following Locker, the solution of broadening the definition of product would give just an average price of the BH in each country, which is equal to the price of the most representative variety within a BH, as in (1). Taking into consideration the graphical representation 1b) the approach suggested may evaluate the effect due to the lack of representativeness. The area \( \omega_1 \), which consists of all goods and services that are peculiar either to country A or B, are not considered in the calculation of PPPs. The decomposition becomes:

\[
APP_{A,B} = \prod_{j=1}^{N} \left( \frac{P_j^A}{P_j^B} \right)^{w_j^A} \cdot \prod_{j=1}^{N} \left( \frac{P_j^B}{P_j^A} \right)^{\delta_j^{A,B}} \cdot \prod_{k=1}^{N} \left( \frac{P_k^A}{P_k^B} \right)^{w_k^A}
\]

where the third ratio on the right hand side of (2) could measure the effect due to the peculiar characteristics of the country in its consumption basket. Then, calculating Fisher-type indexes and applying the GEKS method it is possible to obtain transitive indicators both at BH level and at a more aggregate level. Therefore, the decompositions suggested in (1) and (2) are valid at any level of aggregation.

The approach proposed could be also applied to the case of integrating the activities of CPI and PPP computations. Empirical analyses are in progress in Italy to develop regional PPP using data collected for CPI and with surveys for particular items (Biggeri et al. 2008).

**References**
