ICP Workshop, Tunis Nov. 03

Overview of the Sample Framework

The target Basic Heading PPP

- Suppose complete information were available on expenditures within each basic heading, what PPP would be the target?
- Choose Fisher as the target for a binary comparison.
- It is then necessary to estimate the Laspeyres and Paasche indices between the two countries.

Estimating Laspeyres

- The Laspeyres is an expenditure weighted average of the price ratios for the individual products. In an ICP context, call these product PPPs.
- The product PPPs are ratios of the annual average national prices in the two countries.
- It is not possible to collect prices for all products.

Estimating Laspeyres

- Select a sample of products to be priced using probabilities proportional to expenditures in country A.
- This determines the product list to be used by both countries A and B.
- If some of A's products are not available in B they have to be left out.

Coverage of Laspeyres

- The Laspeyres then becomes a weighted average of the product PPPs of those of A's products that are also available in B, weighted by A's expenditures.
- A weighted average of the sample product PPPs using probabilities proportional to A's expenditures then provides an unbiased estimate of the population Laspeyres.

Estimating Paasche for B on A

- The Paasche is the reciprocal of B Laspeyres index. Therefore, calculate B's Laspeyres using the same method as just described for A.
- Note however the product list is different.
- Both A and B have to collect prices for all the products on both their lists.
- The common list is the sum of both lists.

Estimating Fisher

- Estimating Fisher requires a longer list of products than estimating either Laspeyres separately.
- When a third country is introduced, the list gets larger. The list gets progressively larger, the larger the number of countries.
- The only way to avoid this is to reduce the sizes of the samples of products used to calculate each individual Laspeyres.
- There is a trade off between the number of countries and the sizes of the samples, or lists of products, for the individual binary Laspeyres.

Numbers of products and numbers of prices per product

- There is also presumably a trade off between the number of products that have to be priced and the numbers of price observations collected for each product.
- Much depends on how large the spread is between Laspeyres and Paasche.
- The spread depends on the variance in the individual product PPPs between a pair of countries.

The variability of the product PPPs

- As the variability of the product PPPs between a pair of countries increases, the more important it is to have a common list of products that includes enough products to estimate both Laspeyres indices properly.
- Variability argues for having large lists of products.
- Variability is not a characteristic of a single country but of a pair of countries.
- The more diverse the two countries are, the more products that may need to be priced.

Representative products

- The ICP cannot follow the procedures outlined above as detailed expenditure data are not available within each basic heading.
- The list of representative products is meant to serve as a proxy for the Laspeyres list.
- For ICP purposes, the list of m representative products is obtained by taking the m products with the largest expenditure shares.
- Even these are not for certain. They are the m products that experts believe or judge to have the largest expenditure shares.

The ICP methodology

- The method used to calculate the basic heading PPPs mirrors the process of calculating a Fisher.
- The geometric mean of the PPPs of a country's representative products is treated as being a *Laspeyres type* index.
- Each country must have enough of its own representative products on the common product list to enable a Laspeyres type index to be estimated with each other country.

Samples of prices

- For each product on the list that is actually available, each country has to take a sample of prices to estimate the average price.
- In this case, it is possible to draw samples using probability sampling, at least for the selection of outlets,
- The size of the sample depends on the degree of precision required.

Price variation

- The size of sample needed to achieve a given degree of precision increases with the variance of the prices for the individual product in question.
- This may vary considerably from product to product and depends on the type and structure of the market.

Reliability

- Given the criticisms made of the reliability of the ICP results, an effort needs to be made to ensure that sampling errors for the average prices are kept within acceptable bounds.
- The sampling errors for the individual product PPPs are not entirely within the control of the country itself as they depend equally on the sampling errors of the average prices in the partnet country,

Reliability of the basic heading PPPs

- The reliability of the basic heading PPPs however cannot be estimated.
- Ensuring that the average prices are estimated accurately does not imply that the basic heading PPPs are reliable.
- Not only do the average prices have to be estimated reliably but they also have to be estimated for the ‘right’ lists of products.

The big trade off

- There are two issues.
- One is to ensure that the right products are being priced and that there are enough of them. There must be principles governing the the selection of products and criteria to determine whether the list is large enough.
- The other is to ensure that the samples of outlets are large enough.