

Problem areas

Moderator: Walter Lane, Bureau of Labor Statistics

Participants were invited to submit problems they were confronted for consideration of the meeting. The following are problems or issues of general interest in respect of CPI construction discussed in this session.

Problem 1 - Editing of outliers.

The issue was how price 'outliers' identified by the editing system should be treated when the reported prices were correct. In this context the issue was whether the outliers were 'representative'. The possibilities being considered included rejecting such outliers, applying some statistical procedures to reduce/replace the outlier value with a value which meets some predefined criterion (based, say, on inter-quartile range).

It was pointed out that it was important to look at reasons for price changes. In a number of areas it was common for firms to adjust prices infrequently so that when prices were adjusted they could be by relatively large amounts (compared to the movements in other comparable prices in that period). If such changes were treated as outliers and excluded or adjusted then legitimate long-term price movement would be missed and the index biased.

A number of delegates stressed the need to have as much input editing as possible undertaken in the field by price collectors. With the use of available collection devices (hand helds) it was possible to program in various editing checks. Such checks should be relevant and readily understood by price collectors. Using this approach editing in the office can focus on other aspects. Focus of editing should be on high risk areas - items with large weights and where few prices were collected. If large movements were to be edited it was important not to have a procedure (or algorithm) which introduced a bias - there was a need to ensure price rises and falls were treated in an even handed manner and symmetry was achieved over time.

The need for caution with automatic editing systems was emphasised. Automatic editing systems could tend to cut out large increases and lead to a likely long-term downward bias (as there would generally be more cases of large price increases than large price falls).

The guideline used for the HICP was put forward as a good guide – 'accept unless proved wrong'.

It was pointed out that in undertaking editing at the macro level there was a need to apply judgement and a useful approach was to require compilers to assess outcomes against expectations. It was important to bear in mind that samples were generally small relative to the universe. Thus the issue was not one of the price collected being right or wrong but rather its representativeness.

Problem 2 - Does the geographic coverage of the CPI need to include the whole country and the demographic coverage include all households?

Currently the geographic coverage of the CPI in some countries covers price changes only in the major cities and/or the demographic coverage is restricted to say lower to middle income households. There was pressure to expand the geographic coverage to the whole country and demographic coverage to all households but this would be costly and raise many practical difficulties.

Participants presented a range of views. Some claimed that prices rose more rapidly in the big cities. Consumption patterns were also expected to differ between metropolitan and rural

areas. The EU rule was to not leave out any areas that accounted for more than 1% of the population.

On the other hand the evidence from France indicated that there was no big difference in price change between big cities and rural areas, although short-term movements could differ reflecting differences in outlets and products. Data on food prices in Australia, collected some year ago, also supported this case. However, it was likely that regional differences could arise in prices of items that are most difficult to collect, such as services. It was important not to confuse the issue of differences in rates of price change (which is what the CPI is intended to measure) with differences in price levels.

In general, it would be reasonable to expect the variation in behaviour between metropolitan and rural CPI's (within a country) to be related to differences in infrastructure and household incomes. In the more developed countries, with good infrastructure and relatively small differences in household incomes across regions, the CPI's are likely to show similar behaviour over the longer term. In the less developed countries, income disparities are likely to be greater, increasing the likelihood that expenditure patterns will also differ. The absence of good transport systems will also serve to make access to rural areas more difficult and minimise opportunities to arbitrage. These factors could result in differences in CPI behaviour.

An important additional consideration would be whether the index was intended to measure changes in prices experienced by residents of a region, or changes in prices charged for items sold within a region. This has implications for weights and pricing practices and tends to be more important for non-metropolitan areas as households in these areas are more likely to purchase goods from outside the region in which they are resident (e.g. from metropolitan areas). To the extent that this occurs it may also reduce the number of prices that need to be collected in non-metropolitan areas. Point of purchase data would be required to adequately address these issues.

There were also practical issues such the level of training and expertise required for local price collectors if extending beyond the major cities to ensure prices are accurately collected.

It was also mentioned that in making a decision on the coverage of a CPI, non-statistical issues may take precedence over statistical considerations. For example, to maintain public confidence in the index it may be deemed important to cover rural areas even though this may have little impact on the actual movements shown by the index.

Problem 3 - Items purchased on the Internet.

A number of issues were raised in respect of purchases over the internet. First, if the items were purchased from outside the country should they be included in the boundary of the index? If they were included how could they be priced (i.e. how could samples of outlets and items be selected)?

Delegates recognized that this was a significant emerging issue and should be flagged for detailed consideration at the next meeting in Paris.

If the item domain was the purchase of all goods and services by residents of the country, then there was general agreement that purchases over the internet should be included.

One practical problem raised was the identification and quantification of the significance of these purchases. One approach suggested was to make use of data available from market research firms and/or credit card companies on such purchases.

In pricing such items the issue arose of exactly what was being purchased - are there extra services being purchased over and above the purchase of the goods (such as delivery costs)? If so, how to measure these to constant quality? It may be necessary to separate such costs and to put them into another component of the CPI such as delivery charges. Also, these prices were not always of a flat or per unit nature and this complicated their measurement.

A practical problem was the number of firms entering this market only to disappear in a short space of time. The ease with which firms may enter and leave the virtual marketplace and the ease with which consumers may substitute providers, may pose different sampling problems compared with the sampling of conventional outlets.

Another issue raised was whether in fact prices for goods purchased over the internet moved differently to those in conventional outlets. If the movements were similar, then it was not imperative that purchases over the internet be priced (although such expenditures would need to be included in the weights). It was noted that some years ago the use of mail order was expected to become very significant but had not and the question was raised as to whether a similar outcome might occur with internet purchases.

Problem 4 - Use of the average of price relatives versus geometric means in the calculation of indexes for elementary aggregates.

Elementary aggregates are the lowest level of the index and the only level for which indexes are calculated directly from a set of price observations. Indexes for these price samples can be calculated using various formulae, the main ones being the arithmetic mean of price relatives (APR), the ratio of arithmetic mean prices (RAP) or the geometric mean (GM). The issue arose as to which average was the more appropriate.

It was pointed out that this issue is covered in the new manual. The established position of the Ottawa Group is that the geometric mean is the preferred formula in most circumstances except those where zero prices are possible. In these situations, the ratio of arithmetic mean prices is the preferred approach. The arithmetic average of price relatives is generally discouraged as it is biased in price bouncing/linking situations.

Problem 5 - Frequency of weighting updates and sample rotation.

In introducing this issue, it was pointed out that there was a general move by countries to more frequent updating of weights (with a number of countries having annual updates).

A general issue raised was the availability of the data to implement this. It was costly to obtain such data and it was not clear that the benefit justified the cost.

A potential 'bouncing' problem was identified due to the weights being introduced relating to the previous year. This could lead to a linking problem where items were subject to fluctuations in price and quantities. To overcome this problem consideration should be given to using a moving average (a practice that has been adopted in some countries).

Where weights are derived from a HES the issue of whether the sample sizes supported annual weight changes was seen as an issue. This further supported the concept of basing the weights on a moving average.

A number of delegates raised the concept of reweighting at different frequencies at different levels of the index with more frequent updating at the lower levels (as this is where substitution primarily occurs).

Regardless of the frequency of updating, it was pointed out that the procedures to be followed should be publicly known and transparent in order to maintain public confidence in the index.

Problem 6 - Expenditure abroad - students attending foreign universities.

A case was put forward where the expenditure by households on education of their children at foreign universities was almost as high as expenditure on education at local universities. The issue was whether such expenditure should be included in the weights and, if so, how to price.

The discussion concluded that the key considerations were whether the expenditures were best regarded as expenditures of resident households or not, and the stated objective or definition of the (individual) CPI.

The System of National Accounts 1993 advises that “*Students should be treated as residents of their country of origin however long they study abroad, provided they continue to form part of a household in that country.*” (paragraph 14.20.) Therefore, it would be reasonable to conclude that most, if not all, expenditures on education abroad can be regarded as expenditures by resident households. (The alternative might be an unrequited transfer from a resident to a non-resident household, with the latter then purchasing the education service.)

Therefore, if the CPI is intended to measure changes in prices experienced by resident households, expenditure on education abroad would be in-scope.

These transactions would not be in-scope for those CPI’s defined as measuring changes in the prices charged for items sold within a country’s (or region’s) economic territory.

Direct pricing of these services may be problematic, as the national statistical office would have no legal powers to enforce provision of data by non-resident entities – although voluntary co-operation may be forthcoming. If explicit price data is unavailable, an acceptable alternative may be to use a component series of the CPI for the country in which the educational institution is located, adjusted for exchange rate movements. The viability of this option would depend on whether the institution has a uniform charging schedule (i.e. does not adopt price discrimination), and whether a conceptually equivalent index is available.