

Distr.
GENERAL

CES/AC.49/1999/8
29 September 1999

ENGLISH ONLY

STATISTICAL COMMISSION and
ECONOMIC COMMISSION FOR EUROPE

INTERNATIONAL LABOUR
ORGANIZATION (ILO)

CONFERENCE OF EUROPEAN STATISTICIANS

Joint ECE/ILO Meeting on Consumer Price Indices
(Geneva, 3-5 November 1999)

PRICE COLLECTION

Invited paper submitted by the Central Statistical Office of Austria*

Summary

This paper deals with important issues of price collection for consumer price indices. It is mainly related to the OECD/ILO CPI manual exercise and therefore the draft outline was used. The collection of prices is crucial for statistics because mistakes and misunderstandings are likely to have high impact on the results.

Keywords: Consumer price index, timing, item specification, sample optimization.

General intention of price collection

1. As this paper deals with price collection for consumer price indices, price collection for other purposes is ignored. For Consumer price indices the collection of data is a bottleneck situation: the quality of the consumer price index cannot exceed the quality of the price collection.

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2. The general intention of price collection is normally to record **prices of important goods** and services in the market in given outlets (volume sellers). Beside this general aim there often is the other aim to stick to a chosen article "as long as possible". - The latter can well come into conflict with the first and a good price collector has to distinguish between the different needs of representativity and continuity in detail. Head Office has to be aware of this possibly arising conflict - see below.

3. So price collection can gain a dynamic aspect: A price is not simply a number on a label of a good. While the price on the label is usually the answer to first question of the interviewer, a price should rather be seen as a flash occurring in a transaction between seller and buyer. The additional question should be whether the goods which are bought are really those, for which the prices are collected. Where the numbers on the label and the transactions coincide, price collection is easier, of course.

I. Important points for price collection

4. The systematic recording of prices seems to be an issue with increasing importance to public and economy. While statisticians dream of comprehensive data bases, such an aim is not likely to be reached within short.

5. Skilled price collectors, people who do the work "in the field" are desperately needed for a high quality measurement of price development. Possible mistakes, that arise from the beginning of price recording are not likely to be easily detected and can lead to much additional work for all other involved staff. Possibly missing data perhaps can never be reconstructed in reasonable time, due to the always pressing publication calendar.

6. On the other hand, well trained price collectors, providing necessary information in the expected format can support the Head Office enormously: First by saving time for control and correction, second by contributing to high quality statistics.

7. The **image of the price collectors** is therefore a highly important issue: They are deemed to communicate with the shopkeepers from expert to expert, rather than as perhaps unterpaid minor employees. Where the shopkeepers are responsible for their outlets and deemed to be "experts" for this profession, the price collector is also a kind of an expert as far as he has to look for representative observations, for relevant prices and - most important - price determining quality characteristics.

8. The Head Office should use resources and personal management skills to show the price collectors the appreciation of their work and to encourage them to feedback from the field.

II. Timing

9. The time to collect prices is primarily an organisational issue and not so much a conceptual one. Normally the time should be selected by organisational reasons. It is not likely that the timing of price collection has a large impact on the result of the index. However, it should not take place at the very beginning or at the very end of the reference month (in that case the price could possibly not be relevant for the reference month).

10. As far as the time when the price collection takes place is concerned, there are two options: price collection on one - or sometimes two or more - points of time in the month or price collection over some time interval up to a whole month. When the first is chosen, for practical and technical reasons the actual price collection will take more time than one day. Systematic differences between these two options are unlikely.

11. There are two exceptions from the above rule of thumb: The timing of price collection has a considerable impact on the result when there is high inflation (e.g. above than 30% per annum or about 2% per month). Second: there are specific products where there is a certain amount of time between the beginning of consumption and the payment, therefore the price survey has to take care of timing aspects for such products in their specification.

12. When high inflation or even hyper inflation occurs, then it does matter when the prices are actually collected. In such cases the definition of a point in time to which all price collection shall refer to, seems preferable. The alternative would be an average over the month defined by the order of price collection, which can be arbitrary. Also in most countries there exist some sensible products, the prices of which the public takes care of (e.g. petrol). The definition of a certain day, to which price collection relates may be regarded as helpful.

Timing related item specification

13. For some specific products the time of payment does not coincide with the time of consumption (e.g. electricity). Where that also coincides with seasonal price movements (e.g. package tours) special attention should be given to the concept of time the prices relate to.

14. For the EU countries the prices relevant for the reference month are those, which consumption starts in that month. Prices for electricity therefore are relevant when the price enters into force, albeit paid much later. Analogously prepaid goods and services become relevant, when the consumption can begin and not at the point of time when the payment takes place.

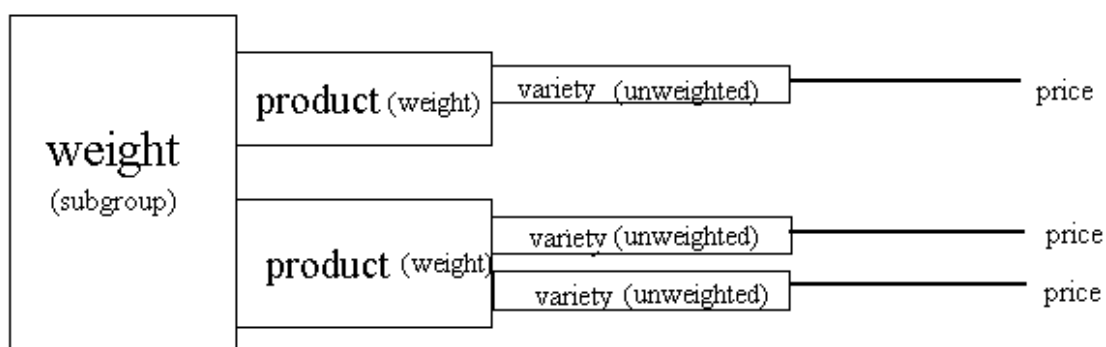
15. Prices for package holidays within that concept would also become relevant, when the holiday begins, though it may have been paid much earlier.

III. Item specification

16. The terminology in this section is not yet fully "harmonized". A "product" is the lowest level of the basket for which explicit weights are used. A "variety" for which prices are recorded is below this level.

17. In the outlet two issues are to be done by the price collector: First a representative has to be chosen for which the price is to be observed; second this price has to be recorded again in the next month.

18. The first situation is characterized by the picture below: The prices that are chosen are representative for one variety (specified by Head Office) of some product (selected by Head Office). Example: price for one chosen silk tie representing all silk ties (variety), this representing all ties (product). The products are representative for a specific part of the weights i.e. consumer expenditure (ties and gloves). It is important that the price collectors know about the meaning of representativity when they have to select a specific article to be observed. Once a this article is selected, in the next month the same question of representativity arises again - in principle. Normally it is not likely that a specific article which was representative in one month will loose this attribute in the next month. Therefore the chosen price observations can normally be observed longer than one period.



19. From the above picture we can also see a necessity of a specification of a variety for price observation. The Head Office has to select product and varieties in order to give the price collectors the chance to find price observations in the outlets.

20. The specifications should be broad/loose enough, that the price collector can find **enough prices** and narrow/tight enough that a certain

homogeneity is met. "Enough prices" is related to representativity: When too few prices in the outlet fit into the description representativity cannot be assumed. "Homogeneity" on the other hand means that changes can be handled with reasonable resources and that perhaps a meaningful average price can be calculated (and, eventually, be published). The standard deviation of the price relatives can give an indication how broad or narrow the specification is.

IV. Procedures

21. The procedures of price collection are similar to other statistical procedures: The completeness and the confidentiality has to be granted, first by the price collector in the specific field, then by the Statistical Office in general.

22. For the use of handheld computers for price collection encouraging experience exists in UK and Italy. The improvement for the Head Office can be quite large in speed and data quality. For the single price collector the computer supports the work and the professional image rather than saving a lot.

23. For the Head Office the question may rise, how far away the prices should be collected, i.e. locally vs. centrally. It is quite clear that goods and services, that are either complex (e.g. cars) or likely to be similar for the whole country (e.g. telephone charges) are better collected centrally. Additionally, central collection allows strategic sampling in order to select the articles according to market representativity. When fewer prices are collected centrally, more attention can be paid to each and possible substitutions and quality adjustments are easier to perform.

24. During the monthly collection procedure communication between the collector and Head Office should be possible. That is important because the time interval until the next collection in the next month is so short, that repeated mistakes could occur.

V. Related Issues

25. The question of what shall be achieved by the use of scanner data can help in sampling and price collection issues. "What would we do if we could what we want?", is going to be crucial because lots of data are in principle available.

26. In the **Annex** there is an example for optimisation of the Austrian sample. The index-weight and the standard deviation of the price relatives (for several months) was used to calculate an "ideal" number of prices to be achieved. In comparison with the actual number specific actions could be

taken. The method has first been used by UK and is referred to as the Neyman-Chuprov-Method in stratified sampling theory (see for ex. W Cochran, Sampling Techniques, John Wiley & Sons, New York 1977, p.96)

27. Typical questions on which to answer price collectors should be prepared:

- What is the CPI, what is it used for?
- Why do you ask in this outlet?
- Am I obliged to answer?
- All prices remained stable!
- The CPI is manipulated anyway!
- Are the data I am going to give treated confidentially?

Such questions show, that the image of the central Statistical Office in the public is not independent of the price collection. On the other hand, the training of the price collectors has a direct impact on the image of statistics.

ANNEX

Sample optimization in the Austrian CPI

1. The aim was to collect prices with respect both: to more/less important goods (measured by the index weight) and more/less volatile price movements (measured by standard deviation of the price relatives). This should help to pay equal attention to equally important areas of the CPI.
2. The variance of the overall CPI can still not be directly measured and was therefore neglected.
3. For each weighted Product (good or service, CPI-Total: 710) the planned number of prices was calculated: The standard deviation of the price relatives was multiplied by the index weight and by the constant factor 45 (chosen in order to give a total sum equal to present price collection).

Planned No of prices = CONST * STD (price relatives) * WEIGHT

4. The planned number of prices was significantly higher than the actual number of collected prices in the fields furniture, garments and public services; and it was lower in the food sector. - As a consequence the number of shops for food was reduced by some 25%. The saved resources were used to increase the price survey in the underrepresented areas (more goods).
5. The calculations were easy and gave good arguments for changes. However, statistical errors can occur for the index weight as well as for the standard deviation of the price relatives. The index weight can be wrong because of changes in the consumption pattern. The standard deviation can be the wrong indicator because the item specification is too broad or too narrow. That is why the resulting planned number of prices cannot be used blindly - as well as every other kind of statistics.
