

**Summary of discussion**  
**Joint UNECE-ILO meeting on Consumer Price Indices**  
**(Geneva, 1-2 November 2001)**

1. Mr. J. Greenlees (BLS, USA) was elected Chairman and Mr. C. Boldsen-Hansen (Denmark) Vice-chairman of the meeting.

Information items

2. Mr. D. Fenwick (ONS) informed participants about the work of the Technical Expert Group on revision of the ILO CPI Manual. He noted that the 5<sup>th</sup> TEG-CPI meeting was held on 31 October 2001 and that the group is completing the drafting and revision process. He also mentioned that the draft of complete new Manual would be finalised in the first half of 2002.

3. Mr. J. Greenlees (BLS) informed participants about results of the last Ottawa Group meeting that took place in April 2001 in Australia. He mentioned that, among other topics, members of the Ottawa Group also reviewed and discussed drafted parts of the new CPI Manual and gave their comments. He informed participants about the forthcoming Ottawa Group meeting, organised by INSEE (France), scheduled to take place in November 2002 in Paris. Topics for this meeting have already been selected, and include items such as: financial services, health and social services, electronic commerce and coping with changes in complex pricing schemes. The representative of France added that the agenda has not yet been entirely finalised and additional proposals would be welcomed in the next two months.

4. Mr. J. Astin (Eurostat) gave a detailed account of Eurostat work and activities on HICP since the last Joint UNECE-ILO meeting (1999). He mentioned that, so far, there are 13 implementing and 14 framework regulations covering the HICP. Future regulations will cover owner occupied housing and quality adjustment and sampling. He further noted important work related to harmonisation of terminology used in member states. Eurostat work in HICP area is multifaceted and involves compliance monitoring, preparation of manuals and organization of user seminars, as well as further promotion of HICP through publications, pamphlets and acceptance of HICP as a standard measure of inflation (by European Central Bank and EU member states national treasuries). Another important area involves work with candidate countries and their smooth integration into the HICP system in the near future.

5. Mr. K. Zieschang (IMF) informed participants about the latest activities of the Intersecretariat Working Group on Price Statistics (IWGPS) composed of representatives from IMF, OECD, Eurostat, ILO, and UNECE. Both TEG-CPI and TEG-PPI were established under the auspices of IWGPS to undertake revision and drafting of manuals for consumer and producer price indices. He noted that the work on the PPI Manual progressed very well and that drafted chapters are available on the IMF website. He further informed participants about the forthcoming IMF course on price statistics which will be held in 2002 in Vienna, as a continued effort of his organisation to educate price statisticians around the world. He also mentioned the IMF work on assessment of data quality and invited participants to consult the IMF data quality reference website.

Item No. 4 Treatment of quality changes in consumer price indices

Discussant: Mr. C. Boldsen-Hansen (Denmark)

Invited papers by E. Diewert (Canada) and Mr. Mick Silver and Mr. Saeed Heravi (USA)

6. Mr. C. Boldsen-Hansen (Denmark) opened the session and introduced two invited papers that discussed the outcome of different methods of quality adjustment. He noted that adjustment for quality changes is one of the most difficult problems in CPI construction.

7. Mr. Diewert's paper discussed hedonic regressions from the viewpoint of economic theory. It described relations between different functional forms and the underlying assumptions about consumer behaviour. It also compared traditional matched model methods for dealing with quality change with the hedonic regression approach and indicated conditions under which the two approaches were likely to coincide. The main conclusion of this paper was that the two methods give almost identical results provided that the amount of matching is relatively large.

8. The second paper compared the outcomes of different methods for quality adjustment, i.e. matched models approach and hedonic method. The authors expressed some scepticism about the use of matched models as compared to hedonic regression. The main reason is that in the matched model approach some information was thrown away. The paper identified the reasons why the matched models method might fail, the main one being its static sampling universe. The matching of prices of identical products over time and excluding of unmatched new and unmatched old models from the sample may lead to the monitoring of a sample of models increasingly unrepresentative of the population of transactions.

9. Various aggregate monthly price indices for washing machines were computed by using scanner data containing detailed price and quantity information, to compare the results of different methods for quality adjustment. The experiment showed that matched model approach gives the same results as hedonics when there are no products disappearing from the market or if prices of unmatched new and unmatched old models do not differ from the matched ones. It was suggested that the matched model approach might not be appropriate for the markets where models change rapidly due to technological innovations. It was argued that in such markets the matched sample might, if not regularly updated, be quite unrepresentative by the end of the year.

10. The disparities between the results of hedonic and matched models indices indicated the need for including a sample of unmatched new and old prices when compiling indices. Hedonic indices, which have the advantage of using the full sample of matched and unmatched models, were proposed as a preferable approach to measure quality adjusted price changes in markets with a rapid turnover of models. As an alternative to this method, it was proposed to refresh the sample by updating it biannually, quarterly or preferably, monthly or to use the short term modified Laspeyres formula.

11. In the discussion, it was pointed out that different methods very often give more or less the same results providing that the amount of matching is relatively large. The two methods will differ only if the (estimated) price increase for non-matched items is different from that of matched items. In Denmark a comparison between hedonic regressions and the matched model approach has been made for cars. The results were very similar and it was concluded that there is no need to use hedonics for the time being. It was indicated that the matched model approach excludes some information but may be more efficient regarding treatment of items with completely new characteristics and it is rather cost-effective. Hedonic regressions approach might be useful for retrospective analysis of, as an example, the price determining factors or elasticities, if we have both prices and volumes. It was also argued that the monthly matched model approach might give a better result than hedonic regression.

12. Some reservations were expressed regarding the use of the hedonic method in the smaller countries. It was pointed out that this method might not be suitable for these countries because of the structure of the market where there are only few outlets and not enough data to run regressions. In addition, the use of hedonic regression might be impossible due to the lack of resources.

13. It was argued that, if the results of the indices using hedonic regressions and other traditional methods are very close, it is not important which method is used. However for models that are subject to rapid technological development it might be more appropriate to use hedonic approach rather than the indirect quality adjustment methods.

## Item No. 5 New data sources and technologies for data collection

Discussant: Mr. David Fenwick (United Kingdom)

Invited papers by the Netherlands and State Committee of the Russian Federation on Statistics  
Contributed papers by Switzerland, France and Finland

14. Mr. D. Fenwick introduced two invited papers and noted that price data collection, whether through hand-held computers or by enumerators in the field is a very expensive activity. Latest trends in many countries reveal that data collection activity is moving away from traditional methods – becoming paperless – and at the same time, less costly and better quality data are obtained.

15. The Netherlands presented how the price data obtained directly from the source (supermarket chains) could be used. The paper sketched basic principles and problems encountered in calculation. These related to classification of individual product bar codes (which were not always in line with COICOP), timeliness related to HICP Regulation, and the seasonal character of some products (treated as appearing and disappearing goods). Special product offers also created difficulties with the Fisher formula used for index calculation. New research will be carried out in 2002 and will be based on the fixed-base Laspeyres index with yearly re-sampling.

16. The Russian experience with price collection using hand-held computers proved to be very satisfactory considering the huge amount of price data normally collected. In the previous period, the major problem was sending out price collection forms to the field where every month enumerators were collecting about 500 000 price quotes. The Russian Statistical Committee, through a series of phases, planned a very carefully transition to and introduction of the paperless technology. After appraising the whole process and ensuring the adequate training for enumerators, with the assistance provided from the outside, these comprehensive preparations resulted in price collection that showed a 24% improvement in the quality of data. The next phase will involve acquisition of more hand-held computers, repetition of the training cycle, extension of paperless data collection to weekly index production and global assessment of the effectiveness of the new method throughout the country.

17. The Swiss paper summarized experience gained from subcontracting price data collection to a market research organisation. After analysing the existing price data collection system, the Swiss Federal Statistical Office decided to subcontract data collection. The contract contained clear and strict description of procedures, accompanied by necessary documentation and, most importantly, a reference guide for price collectors. Advantages from switching to the new system were manifold and the overall experience was very favourable because of the better global control and management of the entire process. New organisation of price collection has also allowed more flexibility, easier adjustment and introduction of new techniques and better harmonization than before.

18. The paper from INSEE (France) presented an assessment of possible uses of the micro-data for washing machines and TV sets in the CPI calculation. The use of micro-data was found to be relatively costly because it necessitated familiarisation with the type and varieties of products, treatment of a very large amount of data and use of automatic and manual procedures for detection and correction of errors. These three disadvantages constituted the major obstacle to wider production of micro data. On the other side, this type of data has the advantage of providing the information on quantities by product model thus revealing the exhaustiveness of the market. Using the scanned micro data obtained from a commercial source and CPI data a calculation was carried out showing the more pronounced biases for micro data. This was due partly to price effect and partly to substitution effect, leaving the impact of quality effects outside of the scope of the study for further analysis.

19. The Finnish paper presented two possible strategies for using scanner data in CPI compilation. One was named the matching approach and the other the classification approach. Both strategies were analysed through an empirical analysis of a geographically representative scanner data set covering 350 outlets and 8 product categories. The paper concluded that traditional matching approach did not

seem to be the optimal solution when using scanner data, and the more promising approach appeared to be to calculate unit values using a less detailed classification scheme. Another conclusion was that the use of scanner data did not resolve the classical index problem of substitution and new and disappearing products, and that construction and use of proper classification might give an additional tool to solve these problems.

20. In the ensuing discussion many questions were raised related to advantages and disadvantages of the use of various new technologies for data collection, costs and organisation of data collection activities, and the role of the international cooperation in this domain.

21. Experiences with hand-held computers are very useful, for both countries already using this tool and those who are only considering its possible use. This technology is currently available, the price per unit is continuing to fall and experience gained so far shows that there are numerous benefits. Those are related mainly to better quality control, increased speed, savings in time and costs and reduced risk of errors in transferring of data. The use of paperless technology further provides better management information, requires better documentation and allows earlier publishing of the index. Critical factors in traditional data collection – clear objectives and effective project planning – are improved with transfer from paper to paperless technology.

22. Some issues however remain to be resolved and they are related to the relationship with market research companies, and costs of switching and introduction of the new technology. It appears that one of critical factors for successful transition to paperless methods of data collection is a proper management of the transition itself. International cooperation and joint strategy when contracting market research agencies seems to be very desirable as it appears that almost all countries that had contracted these agencies were dealing with one or two agencies omnipresent in this field.

23. The use of scanner data clearly showed certain advantages in terms of coverage, timeliness, details of item characteristics and types of outlets, geographical location, etc. However, some disadvantages were also noted. For example, the use of scanner data breaks index conventions, covers business to business transactions, excludes own brands, includes personal and conditional discounts and giveaways, and includes outlet substitution. Furthermore, scanner data must be cleaned, bar codes could be recycled and the whole method could be costly to use. In addition, scanned data are not responsive to the needs of CPI producers. The use of scanned data also raises questions about the quality of these data, assessed to be good in theory but problematic in practical use. When used directly from the source they do not allow control of the sample, and when obtained commercially from market research companies they are usually very costly.

#### Item 6 Practical issues in maintaining the representative sample

Discussant: Mr. P. Haschka (Austria)

Invited papers by Canada and United Kingdom

Contributed papers by Kyrgyzstan, Poland and Greece

24. Mr. P. Haschka introduced the topic and noted that the papers deal with sampling and related quality adjustment aspects. Both papers arrive at a similar conclusion, although Canada uses a cost of living approach and the UK a pure price index approach. He pointed that the Canadian paper addressed the question of how broad or narrow a definition of representative items should be and how samples could be made representative. The Canadian paper argued in favour of a broader product definition, but then the issue of quality adjustment became important as more quality adjustment becomes necessary. The paper from United Kingdom, taking a more empirical approach, examined how representativity of the sample could be tested using scanner data.

25. The Canadian paper looked at ways to keep price samples current and representative, examined the ways samples are organised, considered objectives of the sample maintenance and analysed changes that can be made at different levels of detail. A particular section was devoted to ways that new goods are reflected in the sample. The paper concludes that generally, the broader the definition of representative products, the quicker and more easily changes can be reflected in the index. It also argues that a more decentralised approach to product selection puts more responsibility on price collectors. The paper recommends that the optimal solution for sample maintenance might be to treat different product groups differently. Regular reviews of the sample not only ensure a more representative measure, they also enhance the credibility of the CPI.

26. The UK paper looked at the scope for enhancing the quality of a price index by using scanner data as a benchmark to check the representativity of the sample, to control initial sample selection and to adjust after the possible inadequacies in samples. Using the current sampling procedures for the UK Retail Price Index (RPI), the paper looked separately at two aspects of sampling methodology: item selection and outlet selection. For outlet selection, the paper highlights the differences in prices that can occur between different outlet types, and points to advantages of selecting a more finely defined stratification to ensure representativity. In conclusion, the paper develops improved guidelines and quality control procedures for price collection.

27. Subsequent discussion centred on looking at ways to keep the sample representative while at the same time maintaining practical and operational flexibility. It was noted that keeping the sample as representative as possible and broadening definition would make sample more reflective of market changes. This consequence is not strictly limited to the cost of living (COLI) type of index but also to the Laspeyres concept, although it would require more quality adjustment.

28. In choosing between replacements and re-sampling, price statisticians should be aware of advantages and disadvantages of both approaches. Replacement of a product in the sample requires sophisticated procedures and broader product definition. If the basket of sampled products is kept unchanged for a longer period of time, the sample becomes less representative and will later on need more replacement. Re-sampling also has its drawbacks. On one side it requires a narrow(er) product definition, and the basket constructed in this way becomes closer to the fixed basket. However, the sample becomes outdated relatively early thus necessitating more frequent renewals which in turn require more re-sampling.

29. Maintaining dynamic representativity of the sample continues to be a difficulty, which various offices handle in different ways. The practice in France, for example, is to use a broader definition of product thus allowing a greater flexibility. Replacement of products in the sample is the preferred method, because it ensures better dynamic representativity. Re-sampling is considered less accurate as products might overlap and earlier updates (before the end of the year) are often not possible. Replacement of products on the local level also has its downside as price collectors have to make decisions. This is bound to create uncertainty about the criteria they use and procedures they follow.

30. Participants agreed that a broader product definition would presume more quality changes and more difficult quality adjustments. Quality change and adjustment becomes more serious and related costs rise. A more frequent re-sampling for difficult product groups, those with more frequent quality changes, was suggested as a possible solution. A critical question is how broad a representative product is? A definition of “new good” is also a critical step in an environment full of “new varieties” of an “old” product and totally new products. A function of a classification system then becomes very important, as fitting a product into existing class or sub-class of classification is the first step.

31. On the basis of experiences presented in the discussion, it appeared that some countries prefer less frequent while some others more frequent sample updates. The same method appears to be followed for outlets. In both cases, it also appears that a very important element is more direct and closer contact, continuous re-training and fine-tuning of all elements of procedure with price

collectors. Their knowledge of the market, product varieties, typical outlets and consumer habits appears to be a very critical element for maintaining a representative price and outlet sample.

#### Item 7: Follow-up on choice of cost of living index versus pure price index

Discussant: Mr. Peter Hill (UK)

Invited papers by BLS United States and Statistics Sweden

Contributed papers by Poland, Israel and Japan

32. Mr. Peter Hill (UK) introduced two papers stating that there are two possibilities, two classes of indices that can be used for estimating CPI: a pure price index which is based on fixed quantities and whose movements depend entirely on changes in prices and a COLI which compares two baskets of the same utility. As it is not possible to observe utility, a COLI can only be approximated by assuming that the consumer is rational and will change his or her behaviour in reaction to relative price change. He noted that in practice these two indices show a tendency to converge to each other.

33. The US paper focussed on examples in historical development of the index. It contained a series of statements made by BLS over time. It was indicated that the cost of living approach, which has been adopted as a theoretical framework for CPI, had a very long history in the US. The paper described the operational implications and decisions motivated by COLI approach.

34. It was stressed that the geometric mean was introduced not in response to the “formula bias” which was discovered in the 1990's, but rather as a means to reflect the consumer substitution in response to relative price changes, and thus approximate more closely a COLI.

35. A new superlative index series, which will complement existing CPI series, will be computed beginning in 2002. The inclusion in the existing CPI of a superlative formula, or empirical approximation of a superlative formula, was rejected due to the fact that such an index can be published only with a lag, or in preliminary form and then revised, which is not convenient for users.

36. Description of historical decisions on the treatment of owner-occupied housing was provided. It was stressed that rental equivalent approach was adopted not only as a means of moving the CPI closer to the cost-of-living index, but rather in response to the difficulties in acquiring accurate data on mortgage costs and home purchase prices which were very volatile. Although operational factors played a critical role in this decision, the COLI framework was an essential factor in the adoption of rental equivalence.

37. The Swedish paper addressed the issue of formula and methodology used for computing a COLI. It was indicated that the COLI approach was accepted as an ideal target for the Swedish CPI in the early 1940's. This has had implications on different aspects of CPI construction like the formula to be used, sampling design, treatment of owner-occupied housing, etc. A fixed basket, which is currently updated and temporarily symmetric, was adopted as a way of approximating COLI. The short-term price change is defined as a usual Laypeyres type index with the previous December as a base and with quantities from the previous year as weights. For the years before the current year, the annual price changes are computed with annual quantities from the current years, and then linked each December. Thus, the long-term index is computed as a type of Edgeworth index, with weights that are a combination of weights from year t-1 price updated to December year t-1 and weights from year t price updated to December year t-1. This has avoided a Laspeyres bias of 0.2% annually. Therefore it was suggested that for the long-term index, instead of using weights from the previous period, the weights from the current period should be used.

38. The COLI impact on decisions taken concerning formula for computing elementary aggregates, re-sampling, quality adjustment and treatment of owner-occupied housing was also explained. It was, however, noted that other targets might end up with the same decisions.

39. The paper from Israel described the results of an experimental CPI for elderly people. It was computed in order to test the belief that the overall CPI is downward biased for the elderly. It was expected that the experimental CPI would go up at a higher rate than the overall CPI. The exercise actually discovered that the CPI for the elderly is going up at a lower rate and that indexed benefits may be upward biased.

40. The Polish contributed paper was also briefly presented.

41. Mr. Hill commented on the invited papers for this item indicating that the US paper dealt with theoretical aspects and the Swedish with practical methods for computing COLI. He pointed out that the notion of conditional and unconditional COLI was recognised in the 1974 by the US BLS. It was noted that consumers' overall standard of living depends not only on the quantities of goods and services consumed but also on the general environmental, economic, social and political factors in which those goods are consumed and which are affecting consumer welfare. It was indicated that no ideal COLI could be produced due to the inability to cover all aspects of living standards and that the use of such broad index might not be clear. In that sense only a conditional COLI is of interest for price statisticians. It was also stressed that a properly defined CPI very often approximates a COLI in practice.

42. Regarding the Swedish formulae used for computing COLI and inflation index the question was raised by the discussant why an index that is computed as an inflation index is a better measure of inflation than the COLI index.

43. Concerning the treatment of owner occupied housing the Swedish paper suggested that the rental equivalence and user cost approaches are appropriate for the COLI but not for the pure price index. The discussant did not agree with this. In his opinion the flow of serviced approach is also appropriate for the pure price index. This was supported by another participant who argued that even imputed rents can reflect the actual prices faced by the owner-occupiers.

44. The representative from Eurostat clarified the conceptual framework of the HICP, and explained that, regarding the treatment of owner-occupied housing, it was felt that imputed rents have no place in this index. It was indicated that for an index intended to measure inflationary trends there is interest only in the monetary expenditures which automatically exclude imputed rents for owner-occupied housing but include capital expenditures. It was also stressed that the type of the index is closely related to its scope. The two indices (COLI and pure price index) have different scopes and they may use different formulae.

45. It was stressed that the COLI has an advantage compared with the pure price index because it provides better theoretical concepts for dealing with quality changes and appearance of new goods. Further on it was explained that the COLI is trying to measure constant quality while the pure price index is trying to measure price changes of constant quantities of defined qualities, which means constant weights at a higher level of index aggregation. However keeping constant qualities and thus representativity of the sample requires changes of the weights at the lowest level of index aggregation. In this sense the two indices converge to each other.

#### Item 8: Treatment of electronic commerce in consumer price indices

Discussant: Mr. Paul McCarthy (Australia)

Invited paper by ABS Australia

46. The session was introduced by Mr. Paul McCarthy (Australia) who also presented the paper. The presentation defined e-commerce and described those elements of e-commerce of most relevance to a consumer price index. The second part of the presentation addressed those issues that are considered to be of the most significance for the CPI compilers like: scope of the Internet transaction, problems of classifying internet transactions, construction of a price index for Internet access and problems with price collection over the Internet. In his conclusion Mr. McCarthy noted that although the absolute significance of the household expenditure on or via the Internet is relatively small at the moment it would increase substantially in the future. Therefore national statistical offices were advised to at least commence including Internet purchases in their CPIs.

47. Participants discussed with particular interest the treatment of e-commerce in the CPI. In the discussion it was stressed that Internet purchases are subject to growing interest, especially purchases of books and food from supermarkets. Three problems were identified with this source of information: first, the problem of pricing constant quality (the quality of the goods purchased via Internet may not be at the same level as the one purchased directly in the supermarkets, quality of the services as well) and second, inconsistency in the treatment of items purchased abroad and those delivered from abroad by the Internet providers. The third problem associated with e-commerce is that some of purchases on the web are business-to-business transactions which do not reflect household expenditures.

48. Various questions concerning treatment of quality differences between items sold on the web and those from traditional outlets were raised. It was suggested that an email could be regarded as a substitute for regular mail in which case a quality adjustment should be made. It was also indicated that in many countries it would not be possible to distinguish between the telephone cost and price of the Internet access, thereby it would not be possible to measure the price change of the latter.

49. The question of sampling frame, classification and sampling of Internet providers was also raised. Coverage of e-commerce was also discussed at some length. It was indicated that in Australia what is counted are purchases by the domestic population. Therefore purchases of the resident population rather than purchases within the region were taken into account.

50. In the reply to questions it was indicated that in Australia there are only a few supermarkets with web sites and it is not very likely that business-to-business purchases are made on them. Concerning the quality differences of goods and services purchased on the Internet and those purchased in traditional outlets it was mentioned that it has not yet been resolved. It was pointed out that goods acquired via Internet should be classified as all other goods acquired from other types of outlets.

#### Item 9: Future work

51. After discussing proposals submitted by the Programme Committee, the participants agreed to include the following items in the agenda of the next Joint ECE/ILO Meeting on Consumer Prices which will be held in 2003:

- (i) Owner occupied housing
- (ii) Families of indices for different purposes:
  - Core inflation/forecasting
  - Definition of inflation index
  - Regional indices
- (iii) Data quality
  - Weights

- (iv) Sampling and quality adjustment
- (v) Seasonality and seasonal adjustment
- (vi) Financial services (including a report from the November 2002 Ottawa Group Meeting)