

# Session 1 - Coping with changes to complex pricing schemes

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## Summary of session

CPIs attempt to measure price change of products of consistent quality. But products change frequently, creating the need for sample updating and quality adjustment. The papers in this session involved dealing with changes to products where complex pricing strategies raise several issues: tracking over time the price change in products of equal quality and, when fees are charged through complex plans, defining the overall price itself and taking account the high level of substitution between product offers.

The paper by Haschka deals with explicit quality adjustment methods in cases of changes in the characteristics of service products. Data on replacement rates and quality adjustment procedures used show that the impact of product change is potentially highly significant, with about 2.9% monthly (or over 30% annual) average replacement rate. Price changes often occur at the same time as changes in product characteristics, so it is often inappropriate to assume that observed price differences are entirely due to quality change.

The approach to explicit quality adjustment is based on the idea of “purpose” and practicality, using readily obtainable information and relatively simple, low-cost methods that can be performed consistently and quickly enough to maintain monthly production targets. The goal is to “be approximately right rather than perfectly wrong” in making quality adjustments.

In the case of package tour travel services, the full option price for minor changes in product characteristics (rather than only a proportion of the option price) is treated as quality change on the grounds that the range of available services is large enough that consumers purchasing a package tour value all its features. Explicit quality adjustment is not attempted for major changes in region or location of package tour. The overlap method is used for these cases, which implicitly assumes that any observed price differences are due to quality change.

The factors considered in determining direct quality adjustments are illustrated for changes in package tours, hotel services, driving schools caused by a change in legal requirements for getting a driving license, parking fees, hospital fees, telephone charges and banking fees.

The paper by Gluchowska deals with another type of change in product characteristics, that of inducements, bonuses or extras. Over 50 examples of inducements and their treatment for CPI purposes are illustrated. Inducements can be treated as full or partial quality change or they can be ignored if considered temporary and insignificant. Methods of directly valuing inducements include:

- pricing extras if the extra is sold separately, either in the same outlet or another outlet;
- estimating a value of the extra based on the time used to produce the extra (especially for services);

- price of the main product (without the extra) may be imputed based on prices of other products in the same group;
- obtaining information from outlets or producers to estimate the price of the main product without the extra.

Inducements or extras judged to be significant relative to the main product, such as, for example, a CD included with a magazine, the price increase was treated as the value of the extra, so no price change was shown for the magazine itself.

The paper by Le Gallo and Magnien illustrates the particular challenges of measuring price change for very complex services, that of mobile telephony services. These services are characterized by highly complex and frequently changing pricing schemes which make it difficult to know fees charged to consumers in connection with the range of their micro-consumptions. Moreover consumers frequently switch to more optimal products. A constant utility price index is approximated by a consumer profiles approach. The method uses an approach of tracking the minimum expenditure required to satisfy usage patterns of selected consumer “profiles”. Typical CPI methodology is to sample and track price change in products of consistent quality. For mobile telephony, quality adjustments are a big issue as they may be twofold: when products change and, within the same product, when the consumption patterns of the users evolve over time. Instead, in this new approach, a sample of consumer usage patterns is chosen and prices are tracked by choosing from the range of service plans available the plan that minimizes costs for each consumer usage profile. The method thus avoids both problems of quality adjustment...

The paper explains the method and the challenges involved in applying it to mobile telephony for both service packages and prepaid cards. The assumption of instant migration to optimal plans is then relaxed by introducing “friction” in the rate at which consumers move towards their optimal plan but the with-frictions approach has two important drawbacks : the great complexity of the model and its lack of robustness.

The discussion portion of this session supported a variety of approaches to making direct quality adjustments for product change. It is good practice for statistical agencies to track rates of product replacement and the quality adjustment methods used by product. Clarity of the basis for quality adjustment is needed to avoid excessive subjectivity in applying direct quality adjustments. For some important product categories, hedonic models may be justified. It was suggested that a cost-of-living utility framework might provide a useful basis for making direct quality adjustments.

The relatively high rates of product replacement shown (often 30% to almost 100% per annum depending on the product) provide a reminder that the concept of a “fixed basket” does not really exist at the level that prices are actually collected. The basket is “fixed” in the sense of holding weights fixed at some (usually) fairly detailed level, but not at the individual product level for which prices are collected.

The treatment of the introduction of parking fees in a downtown area was questioned. It was acknowledged that to a certain extent the introduction of parking fees does increase quality by rationing demand. But if no price change is shown, the use of the index as a deflator in the National Accounts would result in increased production in GDP due to the introduction of a

price on downtown parking. It seems unreasonable to ascribe the introduction of a parking fee entirely to quality change.

For driving school training, the purpose could be interpreted as the obtaining of the driving license and thus the increase due to added training requirements for a license could be seen as price increase. However, the change did involve additional driving practice which argued for at least partial quality change.

It was observed that inducements are predominantly marketing strategies, as are random price movements. It was suggested that when not of very high value relative to the main product, most may be safely ignored for CPI purposes since extras are often obviously temporary. This would restrict the set of extras for which quality adjustment decisions must be made. Another and perhaps more careful solution for statistical agencies would be to use simple methods to deal with minor inducements (implicit methods, or very simple explicit ones like quantity augmenting).

In some countries, consumers can easily switch suppliers for prepaid plans for telephony services. In those circumstances, it would be appropriate to group suppliers of prepaid plans and assume that consumers switch instantly to the supplier providing the minimal cost option for their consumption profile.

Consumer profiles must be revised periodically. The next generation of cell telephony services will include added services not currently accounted for in the profiles. The measurement of price change is further complicated by bundling of telephony services with other services such as television or internet services.

## **Recommendations for statistical agencies**

1. Track and publish summaries and analysis of replacement rates, quality adjustment methods and frequency of inducements used by product, as a tool to promote development and application of a common set of principles and methods.
2. Further research is merited into developing a cost-of-living utility framework to be used as a basis for making direct quality adjustments. When the option cost method looks appropriate to estimate quality change (e. g. for inducements), attention should be paid to select the value of the coefficient applied to the full option.
3. Inducements that are known (or judged likely) to be temporary can be ignored or dealt with simple methods unless a significant proportion of the value of the main product. Guidelines should be developed to define more rigorously what constitutes significance for such inducements or extras.
4. For complex pricing situations subject to frequent changes in product characteristics or pricing plans such as mobile telephony, the use of a consumer profiles approach has great promise and merits further research.
5. To better reflect reality, research is needed on the best means of factoring “friction” into the consumer profiles approach.