Measurement of tariff bound prices for services

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1. The price-statistical problem with which the author is dealing in the following is not limited to the collection of s e r v i c e prices; the same difficulties may arise when c o m m o d i t y prices are monitored. But in the author's experience, the problem occurs much more often in connection with service prices.

2. This observation calls for a general introductory remark: It seems doubtful whether it is appropriate to draw a clear-cut distinction between service and commodity prices within the framework of a general methodology of price statistics. It should be kept in mind, among other things, that in reality there are h a r d l y a n y p u r e c o m m o d i t y p r i c e s : Selling a commodity usually involves several services being provided by the seller for the purchaser. Price statisticians generally do take account of this fact, though often without being aware that they are dealing with commodity and service price components at the same time. This is the case particularly if, for commodity price collection, a distinction is made between the survey characteristic "price" and the "price-determining characteristics" which have to remain constant. This is an important distinction. It is even so important that it should be demanded to include, if possible, a l l "price-determining characteristics" for any statistical collection of prices. But what is actually done, apart from determining the commodity by quantity and quality, is just determining also the services connected with the sale of this commodity (such as granting credit according to the time allowed for payment, giving guarantee, providing transport services and the like).

For certain types of services, there are usually no agreements made at all; their extent is determined merely by the individual character of the reporting unit. This is true particularly of the customer's possibility of choosing among a more or less wide and differentiated range of goods and of the technical advice provided by the sales staff. But, because of the additional costs for the seller a n d the increase in utility for the purchaser, there should be no doubt about the fact that these, too, are additional services. These services provided as a result of the individual character of any reporting unit are relevant also to price statistics. This is because the mere differences in extent or quality of such services between different reporting units should prevent the price collector from suddenly changing from one reporting unit to another when monitoring prices over time, or from comparing self-service stores with specialized shops when measuring differences in consumer prices between towns.

3. In this connection, a particular phenomenon of the connection between services and commodities should briefly be outlined. It refers to the c h a n g e o f s h o p c l o s i n g h o u r s of retail stores and other outlets. In the Federal Republic of Germany, there has now been for some time already the possibility of extending the opening hours until 8.30 p.m. on Thursdays. It is remarkable that this Thursday evening is referred to as "service evening" with regard to those shops making use of that possibility.

However, this innovation is of no relevance to price statistics, although the possibility for the customers (in particular working people) of going shopping late in the evening is really an additional service of the salespersons which also should have consequences in terms of costs (overtime premiums); the decisive criterion for price statistics is that there are no price differences between shopping at late hours and shopping at other times of the day.

4. Tariff bound commodity prices are of particular importance in the case of the supply of e l e c t r i c i t y , g a s a n d w a t e r to households, but also to enterprises and other consumers. An essential factor in this connection is that the sellers can provide these commodities (except bottled gas) only via capital-intensive supply systems consisting of pipelines, conduits, gauges, safety devices and the like. These installations are u s e d by the purchasers, while the commodities themselves are c o n s u m e d .

The resulting division of the price into a basic charge and a consumption-based price is however only the basic scheme of the various tariff systems. Usually, such systems comprise manifold differentiations by which the sellers try to take account, on the one hand, of the differences in the cost burden and, on the other hand, of the selling strategies chosen (or determined by the energy policy of the government). Mostly, this results in a most complicated tariff system, and, for practical reasons (simplification of settlement with the clients), the sellers often introduce short forms for the individual components. Price statisticians might then feel tempted to use these short forms for their price monitoring activities. The inappropriateness of such use would certainly become evident at the latest when these short forms are changed, new tariff components are created or existing ones are abolished. Even those short forms seemingly referring to the essential character of a case of consumption cannot be taken as suitable "descriptions of goods" (such as "low consumption tariff", "normal tariff").

For the practical comparison of prices over time, there is only one method which permits to avoid the problems concerning the continued price monitoring in the case of changes in the tariff system: Different cases of consumption are devised by fixing all the characteristics which are represented in the respective

tariff system[1].

The cases of consumption should be as representative as possible, and the average of the total prices for the cases of consumption drawn up should be close to the amount of expenditure recorded for the base year (after segregating the price increase against the base year). This is in line with the principles that are generally applicable to the connection between a price index scheme and the respective price collection programme.

5. As was mentioned earlier, tariff bound prices are more common in the service sector than in the commodity sector - at least as far as the compilation of national price statistics is concerned. Some of these tariffs are very simple (such as the scheme of the seat prices applicable to the different parts of a cinema's auditorium, or the prices put up in a hairdresser's shop and referring to the individual partial services, like shampooing, cutting, setting); other tariffs are very complicated (for instance, sea freight tariffs or the tariff systems nowadays applied to the passenger transport of modern railway companies).

Though it seems hardly credible, price-statistical errors are made even with the most simple tariffs, mostly due to the fact that t e r m s o f t h e t a r i f f s y s t e m are used as "descriptions of goods" for the price collection programme. Since, however, these terms had been chosen for

1) If, for instance, in the electricity tariff for households the basic charge for electricity for cooking purposes differs according to the numbers of cooking plates, provisions have to be made for this fact, too, when describing the cases of electricity sales. If the consumption-based price varies according to the time of the day, the quantity consumed must be split up according to the periods of the day for which there are different prices per kilowatt hour. If these periods change, the descriptions of the cases of consumption have to be changed accordingly. Problems with the transition from the existing to the new differentiation by times of the day can be avoided by obtaining from the start the breakdown of the quantities consumed for each individual hour.

other reasons, they do not necessarily express the items and characteristics relevant to the evaluation of the respective service in market terms.[2] These errors, too, could be avoided by not relying for price collection on terms of the tariff system which have to be regarded as irrelevant to price statistics.

6. The risk that real increases and decreases in prices are not detected or that their real extent is not recorded when collecting service prices is particularly high in the case of complex and complicated tariff systems. The reason is that one might tend to use s h o r t - f o r m s y m b o l s from the tariff text in order to (seemingly) facilitate work. Examples are the "cut-price tariffs" applied in various fields (such as the so-called "economy" and "super economy tariffs" of air passenger transport and railway transport or the cut-price tariffs for telephone calls in the evening and at night as well as at weekends). The extent of the price reduction against the normal tariff partly depends on several characteristics which have to be noted down in detail to be able to ascertain the real price change if the tariff is changed.

The above problem shall be illustrated by three examples: In the past, the system of the German telephone cut-price tariff was changed as follows: A further reduction of fees (the so-called "moonlight tariff" for calls after 10 p.m.) in addition to the reduced fee already applicable for calls after 6 p.m. was abolished; but at the same time the reduced fee (now without further differentiation) was extended to cover a longer part of the weekend. The former economy tariff used

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2) If, for example, the price for a cinema performance is collected by asking for the price for a "seat in the stalls", one may get a wrong information. This can happen if the seats covered by this description are becoming a little bit cheaper; but "stalls" now refers, for instance, to rows No. 1 to 4, while previously the stalls comprised rows No. 5 to 8 (which even may still consist of more comfortable seats than rows 1 to 4).

by the German Federal Railways for passenger transport was characterized by differences in the economizing effect, depending on the different times of the year in which the journey took place.

The new economy tariff however varies by two minimum distances and, accordingly, different conditions (e.g. whether by the return journey a weekend is included wholly or only in part). But also for the normal tariff, changes in the tariff system may occur, for which the real increases or decreases in prices can be ascertained only by complex calculations. For the normal tariff of long-distance transport, the German Federal Railways will thus abandon the principle of generally calculating the fares according to the number of km. Instead, it will introduce a differentiation of fares by the type of railway line. Also the aspect of competition with air transport shall be taken into account. In addition, it is planned to fix differing prices, depending on the time of the day. Also the differences in the performance of the various types of trains will have a stronger impact on prices than before (principle of product); the occasion for this change is provided in particular by extremely fast trains now put into service.

7. The latter innovation will have to be excluded for price index computations according to the Laspeyres formula until the next base year, because this particularly fast kind of railway passenger transport did not exist before. The essential criterion is not the fact that the tariff position is new.

Here the author is touching a topic which, in his opinion, is misjudged by some statistical offices. Assuming that, in a country where a price index for railway passenger transport is computed on base 1985, the railway administration introduces reduced fares for elderly people (or for juveniles) for the first time in 1987, then there will be n e w k i n d s o f t a r i f f p o s i t i o n s , b u t n o n e w k i n d s o f s e r v i c e s : elderly people travelled

by train also in the base year (though not with a special ticket). Thus there would really be no reason to include the new tariff position "ticket for elderly people" as a new position in the index computation only at the next index reform on the grounds that it is a new kind of position and by referring to the Laspeyres character of the consumer price index concerned.

Many price statisticians however take the opposite view, which is quite inconceivable to the author.

8. It has to be admitted that taking account of the new type of tariff position in 1987 - to stick with this example - for the computation of a Laspeyres index on base 1985 will cause some problems. The reason is that one has to obtain an a d d i - t i o n a l i n f o r m a t i o n which so far has been of no interest, i.e. the share of rail kilometres travelled by elderly people in the total number of rail kilometres travelled in the base year in passenger transport. It may also happen that, when asked for this information, the railway administration refuses to answer on the grounds that there had not been any relevant counts so far. In this case, one simply has to employ estimates for which data can usually be provided even by official statistics themselves (e.g. in the case of countries conducting general surveys on expenditure). The railway administration concerned will certainly have made their own calculations in this matter; otherwise the introduction of that new tariff position would have to be considered as rather careless.

9. In one respect, however, the Laspeyres formula of the price index must be regarded as a warning signal not to be neglected. The estimates on the w e i g h t i n g s h a r e to be allocated to the new price series must definitely refer to the b a s e y e a r . In the present example, the reduction of prices for travels by elderly people will result in a (maybe sharp) increase in the share of such trips. Of course,

this share (referring to the time a f t e r introducing the price reduction) m u s t n o t be used for allocating the weighting share of the price series for passenger transport in the base year - even though counting would be easy now (after the introduction of special tickets for elderly people) and would certainly lead to exact results.

In the present case, any estimated result, even uncertain, by the way is better than completely neglecting the price reduction for elderly people.

10. If the reader agrees with the author in regard to items 8 and 9, he will have to concede that the author is right also with respect to the question to be treated in the following. (At international discussions, the author so far has in fact met with hardly any consent in this matter!)

The question concerned is whether the utilization of a service (or the consumption of a good) which i n t h e b a s e y e a r of the respective price index was f r e e o f c h a r g e (e.g. financed from tax revenue, thus paid by the general public), but for which later, from a certain point, a price is charged, may be included in a Laspeyres price index (if the relative importance in terms of consumption is rather high, the question should be whether it "has to be included"!). This case is relevant, above all, to countries which are in a period of transition from socialism to the market economy. But there are also examples from other countries (such as the introduction of a motorway toll in Switzerland, or the "cost sharing" as part of the "public health reform" in the Federal Republic of Germany, i.e. patients insured under a social insurance scheme now have to pay part of the costs of medical services and devices that in the past were free of charge; or - in several countries - the upward adjustment of the "exemption limit" regarding a fee for a place in a nursery school or in a day home for school children, the fee being graded according to the family income).

The author answers this question in the affirmative without any reservation or modification - and without understanding at all the c o u n t e r a r g u m e n t which has been advanced by his interlocutors to answer the same question in the negative. This counterargument may be formulated in a simplified way as follows: "A price index is the (weighted) mean of the price quotients for a selected range of goods; a quotient whose denominator is zero is no real value; thus the respective good must not be taken into account". The author has objected to this view that this f o r m a l i s t i c p r i c e i n d e x d e f i n i t i o n , just describing the calculation methods usually applied, is not suited for providing answers to questions touching the very nature of a price index. When dealing with questions of this kind, one really has to go back to the original index formula. It says that a price index is a comparison of expenditure sums (in the case of the index of purchase prices) or a comparison of selling sums (in the case of the index of selling prices) with equal quantity components for the reference points in time. For this approach, the case of a zero price in the base year does n o t pose a n y p r o b l e m : The summand for the good consumed free of charge is just deleted from the expenditure (or selling) sum of the base year, because the product of a real quantity factor and a zero price factor equals zero[3].

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3) Also for the calculating method generally applied today (weighting of price change figures according to value), calculating with a zero price for the base year does not have to pose problems if the following calculating trick is used: one assumes fictitiously the first real price (p_o) with the respective value weight also for the base year, u p t o the last computing step which is the division of the sum of the products "price change figure multiplied by value weight" by the sum of the value weights. The correction is made in the last computing step by dividing the sum of the products "price change figure multiplied by value weight" by the o r i g i n a l (smaller) sum of the value weights!

11. The following is a special case of computing indices of service prices: Some price may be defined as a ratio (usually percentage or permillage) of another value, or it may be applicable as an absolute value only in relation to a specific other value. A consumer price index (according to Laspeyres) may, for instance, include also the contribution for membership in a society (also professional association and the like) which, in accordance with the society's or association's tariff, has been determined as a percentage of the member's income or as a fixed amount for individual small ranges of income. Often that amount will not change for a long time or even be reduced, because the "required" increase in receipts of the respective society or association is provided for by the general rise in income. Other examples can be derived from some national indices of building prices which take into account also the architects' fees that are in a fixed proportion to the sum of building costs. Also to be mentioned in this connection are the tariffs of fees charged by lawyers and civil courts (percentages of the value of the matter in dispute).

What is the procedure to be followed here for index computation? Should one proceed according to the Laspeyres concept and continue to use the base-year characteristics of the index household for a consumer price index which includes income-based membership fees? This would mean that, even with extremely high inflation and thus strongly increasing incomes, the price series for membership fees would be absolutely constant or even decreasing. The same is true accordingly of architects' fees and other prices that are in a fixed proportion to a reference value which usually is continuously increasing.

12. There is a wealth of further price-statistical problems arising from monitoring particularly the tariff bound prices and which could also be treated in the discussion. But only the special case of an i n t e r n a t i o n a l c o m p a r i s o n o f p r i c e s shall be mentioned here: In principle, for regional or inter-community price comparisons, the same rules are applicable as for price comparisons over time. No one defining the criterion for good price statistics as the appropriateness of mathematical formulae will even think of the idea that there might be differences to be taken into account, because the symbols of tempus and locus used in such formulae are completely interchangeable.

Actually, the differences mainly refer to the p r a c t i c a l sphere. In the light of many years' experience, the author may state first of all a fact which is true much more of tariff bound prices for services than of other prices: the actual differences in the quantity component between countries (even between neighbouring countries, such as in the EC) are generally bigger than between (neighbouring) points in time. This is simply due to the fact that, for a specific seller of tariff bound services,usually there is no reason to change several tariff items within a short period of time (except for the basic tariff revisions that in general are carried out only at long intervals). Because of the manifold provisions, the tariffs are much more varying on the international level[4]. Therefore it is even more important for

4) With regard to the tariffs for public short-distance transport, this is true not only of the basic characteristics which are obvious and will thus certainly not be overlooked when comparing prices, but it is also true of the details of individual characteristics. The author thus had to realize only recently that only at first sight the "single ticket" for the respective underground of the capitals of two neighbouring EC countries seems to refer to the same service (uniform fare for any ride within the entire underground network). In reality there are numerous differences in the services provided: Only in city A the ticket is valid also for busses, so that one may change to a bus without having to pay again. In A the ticket is valid for two hours, in B for only one hour. In A there are no restrictions with regard to the direction, whereas in B circular trips and return trips are excluded.

international comparisons than for price comparisons over time that price statisticians obtain a l l the tariff material, including the "small print".

For a price comparison over time, one obtains all the price information from the same agency or enterprise which therefore can better assist the statistician in ascertaining the net difference in prices than the two reporting units can in the case of a bilateral international comparison.

Above all, it is more difficult with an international comparison to obtain the additional information required for taking account of the differences in tariffs. If, for instance, only in one of the two countries the transport tariffs show differences in the price level, depending on the share of the trips made during or out of rush hours, it will be difficult for the other country to estimate the share of rush-hour trips.

In addition, there are difficulties in valuating tariff differences. If in one country mail delivery at the normal tariff takes an average of three days, but only one day in the other country, the difference could easily be eliminated if one knew exactly how much more valuable the fast delivery is in comparison with the slow one, when judged in terms of market. And is this judgement still applicable if the other country is ten times as big?

The list of special problems arising for international comparisons of prices could be extended at will.