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SWEDISH CPI PRACTICES FOR DIFFICULT AREAS WITH A NOTE ON INCOME-DEPENDENT FEES

In this short note we will describe the actual practices used in the Swedish CPI for

- insurance
- other financial services
- gambling and lotteries

Several public services in Sweden use income-dependent fees. Examples are day-care for children and fees for the elderly. Such services are not yet included in our CPI but the Swedish Index Board has discussed the principles and methods for such services extensively. In Annex 1 the issues involved in these cases are discussed.

Insurance

An extensive investigation of consumer insurance services was done in 1992 which led to the inclusion of home and car insurance in the CPI from January 1993. Insurances of the buildings are part of the owner-occupied housing item group but are also measured according to the principles below. Life and pension insurance are not included, since they are considered to be more saving than consumption.

The general method adopted in both home and car insurance is to measure changes in gross premiums (which are considered to be the equivalent of prices) for insurance objects of constant quality. No reduction is done for indemnifications, since these are only compensations for damages.

A certain, fully insured, house for which no extensions or other major improvements are done is considered an object of constant quality for which premiums are monitored. Cars, however, are objects with a decreasing quality over time. In this case the principle adopted is to define a car of constant quality as described below.

In practical application, the above principles were applied through random sampling of insurance objects. For cars a sample was drawn from the Central Car Register in which there is also information of the company insuring the car. For the sample (with some exclusions) all *premium-determining factors* were recorded. The most important of these are

- brand and equipment of the car,
- age of the car,
- residence and age category of the owner,
- annual mileage and
- bonus class (depending on number of damage-free years).

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Instead of monitoring premiums for a certain physical car, we hold all these factors constant at their value at the time of sampling.

For home and building insurances, a two-stage sample design was used. In the first stage insurance companies were drawn with probability proportional to the sum of relevant premiums. In the second step insurance objects were drawn from the insurance companies' own registers.

Other financial services

No bank services are included in the Swedish CPI. There are two major reasons for this:
- Fees for these services are a very small part of private consumption, about 0.1%
- Net interest expense (interests paid for loans minus interests obtained on savings) obscures the real price paid by consumers for banking services. From the point of view of a cost-of-living index a transfer of bank income between fees and net interest income should not in itself influence a CPI.

Gambling, lotteries etc.

It is difficult to apply the price concept to gambling and lotteries. Is it really consumption in an economic sense or should we view them as collective transfers or (bad) financial investements?

The principle adopted for our CPI is to let the index reflect changes in the percentage "take" of the organisers **and** changes in the cost of maintaining the real value of a "bet". These then become two multiplicative components. If, for example, 50% of the total bet is taken by the organisers in the reference period and this percentage is increased to 60% in the comparison period, the first component of the index is 100*60/50=120. The second component is, in practice, the total CPI value for all other items.

The only decent alternative to this method is, in our opinion, to exclude this item from the index. However, we took the view that the delineation of private consumption used by the National Accounts (which include gambling) should guide the inclusion into the CPI when there is not strong arguments to the contrary.

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A NOTE ON INCOME-DEPENDENT FEES

1. The problem

Public services are heavily subsidised in Sweden. This fact applies to many different kinds of services, from local transport to hospital care. So far, our general solution to this problem has been to measure the actual prices paid by the consumers. Thereby a change in the level of subsidisation directly influences the index outcome. This approach is relevant for a cost-of-living index but not for a measure of inflation and therefore it has been questioned in recent discussions in the Swedish Index Board.

In this note we will discuss a particular way of subsidising, by fees that depend on household income. The two most important cases in Sweden are public child care and care of the elderly.

For *public child care* (day-care centres) each of Sweden's 286 municipalities decides its own fees. The three most common systems used are
- Fees that are percentages of income with a maximum amount corresponding to a certain income.
- Fees which increase with income but are fixed within income intervals.
- Constant fees (not very common).

Public care of the elderly is either assistance in the old person's home or care in special institutions (nursing homes etc.). Fees are in general divided according to level (intensity) of care and according to income. One variety of this is the use of "reservation amounts" whereby the whole pension is taken as the fee except for an amount of money considered enough for day-to-day expenses.

These two cases have in common the dependence of fee on income. A cost-of-living index can be defined as the ratio between incomes needed to achieve the same standard of living in two price situations. When prices themselves depend on income this definition gets an air of circularity (but not necessarily so as we shall see).

Here, we will summarise three reports (in Swedish) written during 1990-1993 to the Swedish Index Board which discussed the theoretic principles to be applied in these situations.

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2. Theoretic discussion

We could look at the price of an income-dependent service as a general function of income: $f^t(y^t)$, where y^t is income and f^t the functional form of the relation between income and price, both at time t. The one-household index from 0 to t will then be defined as:

$$I^{0t} = \frac{f^t(y^t)}{f^0(y^0)} \qquad (1)$$

Disregarding savings, income is equal to consumption in both time periods:

$$y^0 = f^0(y^0) + p^0 q^0 \qquad (2a)$$

$$y^t = f^t(y^t) + p^t q^t , \qquad (2b)$$

where p^t is the price and q^t the quantity of a second product (or all other products) in the consumer basket in period t.

There are now two ways to look at expressions (1)-(2).

- *Exogenous income.* y is considered as actual income. The price index will then include the effect of income changes. This is not desirable for a cost-of-living index with the above definition. For a deflator it is, however, the appropriate approach.

- *Endogenous income.* y^t is not regarded as the actual income but as the smallest possible income needed for the household to maintain its consumption level from time 0. This point-of-view arises naturally from the definition of a cost-of-living index.

Based on exogenous incomes, various simple statistical procedures could be worked out, e.g. a unit value index taking the sum of fees in a municipality and dividing with the number of persons (households) who achieve a certain, fairly homogeneous, service.

But based on endogenous income, (1) will have to be solved implicitly and will be a function of the price index for other products. In the particular case of an income proportional fee ($f^t(y^t) = r^t y^t$, where r^t is the fee proportion) we could derive the following one-household index from (1)-(2):

$$I^{0t} = \frac{p^t}{p^0} \frac{r^t}{r^0} \frac{1-r^0}{1-r^t} \qquad (3)$$

In the case of more complicated fee structures, the solution could not be written down explicitly but could be obtained without much difficulty through graphical or iterative methods.

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3. What is the answer?

Based on the above analysis the choice is between three alternatives for the CPI compiler:

1. To base the index on exogenous income.

2. To base the index on endogenous income.

3. To exlude income-dependent services from the index completely.

What is the appropriate choice for a Consumer Price Index?

4. References

The following are internal reports at Statistics Sweden, written for the purpose of discussion in the Index Board:

Haglund/Sjögren: Angående inkomstrelaterade taxor. 1990-03-23.

Dalén: Prisindex för barn- och äldreomsorg. 1992-09-15.

Dalén: Prisindex vid inkomstrelaterade taxor, särskilt barnomsorg. 1993-10-13.