Expertise on the relevance of the "Boskin-Report" to the swiss consumer price index

Prof. H.W. Brachinger - Prof. B. Schips - Prof. W. Stier

Summary

A. Task

In December 1996 the final report to the American Senate from the ‚Advisory Commission to Study the Consumer Price Index' ("Boskin Commission") was published in the USA. The main task of the ‚Study Group Boskin' (ARGE-B) was first of all to examine how far the findings of this report ("Boskin Report") are applicable to the statistical recording of price changes in Switzerland. It was also to be examined whether the recommendations of the Boskin Commission to the Bureau of Labor Statistics (BLS) could serve as possible guidelines for the Federal Statistical Office (FSO). In addition the group was to consider which measures already translated into action by the BLS for the improvement of the American Consumer Price Index (ACPI) but not mentioned in the Boskin Report are significant for price statistics in Switzerland. Furthermore the question of which priorities should be taken into account in the revision of the Swiss Consumer Price Index in the year 2000 ("SCPI 2000") was also to be considered. Finally the group was to determine which specific questions of price statistics should be examined in further research projects.

B. Transferability of the findings of the Boskin Report

On the basis of the Boskin Report and an analysis of the current practice of the Swiss Consumer Price Index (SCPI) the ARGE-B comes to the following conclusions:

1. The main task of price statistics consists in a quantitative recording of price changes for consumer goods available in an economy. In a highly-developed market such as the Swiss consumer goods market a large number of goods are available. New products appear continually and the quality of products is constantly being modified. A ‚correct' recording of price changes is therefore a difficult undertaking. The Federal Statistical Office (FSO) fulfils this task to a high degree with the SCPI.

2. At present the Laspeyres formula is commonly employed world-wide for recording price changes. This formula, which also forms the basis of the SCPI, is based on a fixed basket of goods and services and constitutes a statistical estimation procedure. The aim of this type of procedure is the estimation of a given economic parameter. Without further consideration the Boskin Report assumes that this parameter is the value of the so-called ‚cost of living index'. A cost of living index should determine what the lowest possible costs are for a representative consumer or household during a period under review - with changing relative prices - to achieve the same utility level as in a set base period.

Thus it is not the basket of goods and services but the utility level which is kept constant with a cost of living index.

3. The Swiss Consumer Price Index is used as a measure of inflation for a variety of political and economic purposes. It serves not only to measure changes in the cost of living but simultaneously for other purposes too, such as the indexation of economic series or as a basis for deflation in national accounting (NA) or as a guide for decisions in economic policy measures. In addition it is used as a criterion to determine compensation of inflation on wages or on other nominal values such as rents and pensions. Therefore the national index of consumer prices in a way represents an ‚omnibus index', which simultaneously serves a series of purposes.

   A critical analysis of the SCPI must take these various uses into account. The quality of the SCPI is to be assessed according to which index aim is set. In examining the question of how far the findings of the Boskin Report can be applied to Switzerland, such consideration must therefore be limited to a partial aim of the SCPI, namely the recording of changes in the cost of living.

4. It has long been known that the Laspeyres index formula, in comparison with the cost of living index, leads to more or less biased index values in the course of time. The main merit of the Boskin Commission consists in clearly pointing out that various kinds of biases can occur in the use of this index formula. Apart from "substitution bias", "outlet substitution bias", "quality change bias" and "new product bias" are pointed out.

   In the opinion of the ARGE-B a price index can, however, be subject to still further biases. This is always possible when any parameter in addition to those characterising the index formula in question are included. In the SCPI regional parameters assume an important role. Prices are weighted by these parameters according to the demographic significance of the regions where they were recorded. Such parameter values are always either known values or estimates of such values. In the case of known values the danger of bias lies in the fact that these values were included in the index formula within the framework of an index revision and not continuously updated. There is an additional danger of bias if estimates which might themselves be biased are used. Based on these considerations the SCPI may also be subject to a "regional bias" in addition to the above-mentioned biases.

5. For practical conversion of the Laspeyres formula, the multitude of goods to be recorded have to be classified hierarchically in a suitable manner. The well-known Laspeyres formula is employed only on the product categories at the hierarchical level of ‚item strata', that is only at that level price relatives are weighted by expenditure shares. Also below this hierarchical level weighted means of price relatives are calculated in the SCPI. Parameters which express the significance of those outlets and regions where prices are recorded are used for weighting in this case. A *substitution bias* essentially arises in the SCPI when

consumers replace goods that have become relatively more expensive with goods that have become relatively cheaper and this is not sufficiently accounted for in the index formula. Here a distinction must be made between the "upper level substitution bias" arising from inflexibility at the level of item strata and the "lower level substitution bias" caused by inflexibility below the item strata in so-called ‚elementary aggregation'. Inflexibility at the level of item strata occurs when the expenditure shares employed are not adapted to the actual shares. There is inflexibility below the level of item strata when the methods employed in elementary aggregation insufficiently take into account product substitution and the parameters used do not reflect the current significance of outlets and regions.

6. When using the Laspeyres index formula, *the upper level substitution bias* becomes all the greater the less frequently the basket of goods and services is updated in order to place the index on a ‚new base'. Since the 1950s, the American CPI has been updated every 11.25 years on average and the Swiss CPI every 10 years. The time lapse between two index revisions and therefore between two adjustments at the level of item strata is shorter in Switzerland than in the U.S.A. but not substantially so. However, in Switzerland, the weights at the time they are first accounted for in the index calculations are very much more up to date than is the case in the U.S.A. In Switzerland they are generally one to two years old whereas at this point in time they are already usually 3 to 5 years old in the U.S.A. It can therefore be assumed that the upper level substitution bias in the SCPI will not be above that in the ACPI. It will probably not exceed 0.15 percentage points. This bias can only be reduced by a more frequent updating of the weights on the basis of the most current possible household consumer expenditures.

7. The ARGE-B is of the opinion that new goods can be classified according to their "index-suitability" or "index-unsuitability" depending on whether or not they can be assigned to existing item strata within the framework of the current index concept, as additional items. Through active contacts with outlets and through its own regular market observations the FSO is endeavouring to recognise index-suitable ‚new' goods as quickly as possible. The item strata of the SCPI are defined so as to enable inclusions of most new goods that appear on the market as well as new varieties of familiar goods in existing categories. The elementary aggregation formula developed by the FSO, moreover, provides the methodological framework necessary for the continual inclusion of ‚new' goods and new varieties in the current index calculation. Within the framework of the recursive index formula employed there is the possibility of constant updating of the totality of goods. Thus the SCPI is very flexible when it comes to index-suitable changes in the consumer market.

   ARGE-B analyses show that new goods and varieties of goods of modified quality are, as a rule, relatively quickly accounted for in the SCPI compared to price indices in other economies. The appearance of "index-unsuitable" new goods requiring the creation of new item indices categories remains problematical, however. The SCPI can only include such goods during periodic

revisions. But the bias thereby produced occurs quite rarely in the SCPI and is contained in the upper level substitution bias. All in all both the *new product bias* and the *quality bias* in the SCPI are likely to be slight and in any case not higher than 0.2 percentage points.

8. For elementary aggregation in the SCPI a weighted variation of the arithmetic means of price relatives is generally employed today. The use of this method is appropriate for item strata within which there is practically no substitution between the individual products. In general it may be assumed that at least minor product substitution between the goods in an item strata occurs. In such cases the arithmetic means of price relatives method produces a positive lower level substitution bias.

9. Completely new types of outlets do not often appear in the comparatively small area of Switzerland. The tendency to shop at discount markets is much less pronounced than in other economies. The *outlet substitution bias* caused by insufficient consideration of new outlets should therefore be negligible in the SCPI.

10. A *formula bias* occurs in elementary aggregation when the way in which reported prices are processed produces sub-indices for item strata whose formal qualities deviate from the ‚ideal image' of a sub-index. With the recursive procedure of the FSO the current index value is calculated from its value in the previous period with the aid of a correction factor. In view of the systematic positive bias which the arithmetic means of price relatives method produces, this procedure involves the risk of cumulating positive biases. Because of a certain potential for underestimation which is also inherent in this procedure, this risk should not be of any significant consequence. As model calculations have demonstrated, the SCPI on the whole might therefore be subject to a slightly positive or slightly negative *formula bias*.

11. Within the framework of elementary aggregation regional parameters (by which prices are weighted according to the demographic significance of those regions where they were recorded) are introduced into the SCPI. If changes in these parameters are not taken into account, a *regional bias* in the SCPI is likely. In the opinion of the ARGE-B it is not likely to be any significant regional biases in the SCPI.

12. The ARGE-B suggests including formula bias and regional bias with lower substitution bias and outlet bias under the term *elementary aggregation bias*. All in all elementary aggregation bias in Switzerland is unlikely to exceed 0.3 percentage points.

13. The SCPI is just as little a real cost of living index as the American CPI. For this reason the SCPI tends to overestimate the variation of the cost of living. This overestimation is probably limited to 0.5 to 0.6 percentage points per annum.

14. To sum up it must be stated that the Swiss CPI provides a statistical indicator which is today employed simultaneously for various information requirements. The more the SCPI is developed in the direction of a cost of living index, the less well it performs for other objectives.

C. The recommendations of the ‚Boskin Study Group'

It was the special task of the ‚Study Group for the Boskin Report'(ARGE-B) to determine whether and to what extent the recommendations of the Boskin Commission could provide possible guidelines with regard to the revision of the SCPI planned for the year 2000. On the basis of these recommendations and an analysis of present practice, the ARGE-B fundamentally comes to the following proposals:

1. At present the FSO calculates only a single price index at consumer level, namely the national Consumer Price Index. This is used for various purposes. With a view to the growing requirements for information, the FSO should in future calculate several price indices each of which should focus more on a specific information requirement. The ARGE-B proposes that the FSO go over to an extended modular system of indices if possible. Modular system in this case means an index system that, takes into account various basket of goods and services and price measurement concepts (utilisation concepts) as well as alternative weighting schemes. In the opinion of the ARGE-B at least one index that targets the measurement of changes in the cost of living more closely than before should be calculated within the framework of such a modular system.

2. The ARGE-B does not think that the basket of goods and services for a cost of living index should include compulsory charges such as taxes and social security contributions. For one thing the concept of a cost of living index is based on the consumers' freedom of choice and for another compulsory charges simply cover the costs of services received by the consumer. On the other hand prices for risk transfers within private insurance belong in the basket of goods and services of a cost of living index.

3. In the short run, the FSO should go over to using a method based on the geometric mean for elementary aggregation. There is wide agreement in the literature on the subject that as regards the recording of the changes in the cost of living, such a method is generally more adequate than the method of the arithmetic means of price relatives applied up to now.

4. In the intermediate run, the FSO should no more exclusively rely on the theoretical concept of the Laspeyres index. To what extent it is practically feasible to calculate a superlative price index of the Törnqvist type for recording a change in the cost of living should be considered. This index type is characterised by the fact that it corresponds (i.e. it is exact) with the cost of living index for a wide class of consumer utility functions.

A fundamental problem with a price index of the Törnqvist type consists in the fact that it can only be calculated with a certain delay even with annual income and consumer surveys. A chain price index of the Törnqvist type can however be sufficiently approximated by a Laspeyres type chain index. For the calculation of current monthly indices the FSO should therefore abandon the calculation of a conventional Laspeyres type price index and go over to the calculation of a chain index of the Laspeyres type.

5. In co-operation with a panel of independent experts, the FSO should work increasingly towards taking advantage of scientific know-how and current research results. Together with this panel of experts the allocation of further studies on the subject of the statistical recording of price changes should be considered. In particular, an investigation should be made of how practicable the so-called hedonic approaches are in the recording of quality changes. Further, the question of to what extent biases are influenced by the level of general inflation rates is to be examined. In addition analyses of SCPI biases targeted at each of the major expenditure categories should be carried out. At least on an initial experimental basis, cost of living indexes for various socio-economic groups should be calculated. In addition the question of what the relative advantages or disadvantages of a Laspeyres chain index are compared with a "trailing" Törnqvist index should be examined.

The detailed report is only available in German and has been published in the series "Statistik der Schweiz". This publication can be obtained from the

Swiss Federal Statistical Office, Espace de l'Europe 10, CH-2010 Neuchâtel.

Orders: tel. 032 / 713 60 60, fax 032 / 713 60 61,
Order number: 298-9900

Copyright © 2000, Swiss Federal Statistical Office, Neuchâtel