

Distr.  
GENERAL

CES/AC.49/2003/3  
26 August 2003

ENGLISH  
Original: RUSSIAN

STATISTICAL COMMISSION and  
ECONOMIC COMMISSION FOR  
EUROPE

INTERNATIONAL LABOUR  
ORGANIZATION (ILO)

CONFERENCE OF EUROPEAN  
STATISTICIANS

Joint UNECE/ILO Meeting  
on Consumer Price Indices  
(Geneva, 4-5 December 2003)

## **SAMPLING AND QUALITY ADJUSTMENT**

**Submitted by the National Statistical Committee of the Kyrgyz Republic**

### **Summary**

1. The most important and widespread macroeconomic indicator is the monthly consumer price index (CPI), an information resource underpinning economic policy. Accuracy and reliability are therefore of prime importance in constructing the CPI.
2. The construction of the CPI is a complex process involving the accomplishment of a number of key tasks. Representative sampling is the key to reliability, and accuracy depends on the quality of observation. Three types of sampling are used to construct the CPI:
  - (a) Sampling of communities;
  - (b) Sampling of retail outlets;

(c) Sampling of consumer goods.<sup>1</sup>

3. All regional centres are included in the sample, and prices are also monitored in two large districts of the capital city.

4. The results of a survey of consumer expenditure serve as the basis for the determination of weights and the selection of goods. These survey results help to decide on the number of goods and the methods of selecting them for the index.

**Coverage of consumer goods and services**

5. As in many other countries, the geographical scope of the index is limited to urban populations. The reason for selecting these communities is that most consumer spending occurs in urban areas. Furthermore, additional expense is incurred when recording prices in outlying districts. A number of measures relating to the collection of prices for certain food items in certain districts of Kyrgyzstan are currently being developed on the basis of the Kyrgyz agro-industrial market information system, which is part of the World Bank project to support ancillary agricultural services. The purpose is to ascertain whether there is a difference in the pattern of price movements between regions and districts and how big it is. On the basis of these data it will be decided whether prices should be surveyed at the district level.

6. The set of goods and services used to calculate the CPI is the same for all regions of the country and comprises the goods and services in greatest demand. It remains unchanged for at least one year. Items are selected having regard to their relative importance in public consumption and their representativeness in terms of reflection of price movements for similar goods and continuity of availability on the market.

7. In all, the CPI covers 343 goods and services. The index contains three sub-sets: food items, accounting for 33% of all goods in the index; non-food items, accounting for 54%; and services, accounting for 13%. It is further divided into 12 main groups by sphere of activity as per the system of national accounts.

---

<sup>1</sup> The term “good” is used in relation to any goods or services as defined for the purpose of recording prices.

Main groups	No. of goods	Percentage by type of goods
01. Food and non-alcoholic drinks	104	30
02. Alcoholic drinks, tobacco products	9	3
03. Clothing and footwear	85	25
04. Housing services, water, electricity, gas and other fuels	15	4
05. Household goods, domestic appliances and routine home maintenance	41	12
06. Health care	14	4
07. Transport	17	5
08. Communications	6	2
09. Recreational and cultural activities	23	7
10. Education	4	1
11. Restaurants and hotels	6	2
12. Miscellaneous goods and services	19	5
Total	343	100

8. It should be noted that until 2001 some 305 goods and services were monitored, but owing to wide price variations under some of the headings it became necessary to subdivide them, the list subsequently being expanded to 343 surveyed items. For example, as rail fares are virtually static within Kyrgyzstan, but vary outside the country with the exchange rate of the Swiss franc, the weight of rail travel outside Kyrgyzstan greatly exceeds that of domestic rail travel and the index did not adequately reflect reality.

### **Sampling of retail outlets**

9. Retail outlets are sampled by price recorders with help from the authorities. The selection criterion for retail outlets is the representativeness of the outlet for the community it serves. Price information is collected at all kinds of outlet where sales of any good are regular and heavy, including large shops, kiosks, department stores, and agricultural and informal markets (street traders). The outlets are scattered throughout the town and are of differing sizes.

10. The range of outlets included in the sample does not change with time. When an outlet in the sample closes down, its place in the survey is taken by an outlet of similar type and size carrying a similar range of goods. The sample also includes large new retail outlets. Records are kept of the prices charged by 1,086 traders and service providers.

### **Sampling of goods**

11. The following criteria are applied when selecting goods for the CPI:

- The good must have a significant weight in households' consumption;
- The good must have a precise specification;

- The good must be measurable;
- The good must be a staple product used over a long period, even when it does not have significant weight in households' consumption.

12. The basic requirements in sampling goods are that the goods should be monitored regularly over a long period and should be representative of their group. The weights of the groups are carefully determined in the light of household surveys and information about the structure of retail turnover.

13. In weighting groups of goods, use is made of data about the consumption expenditure of households in the "total population" category over the previous year. Consumption expenditure by household includes all goods acquired for consumption and excludes expenditure related to households' commercial activities, contributions to pension funds and social insurance funds, income tax, savings, gifts and goods for which there is no real market price (own consumption of agricultural produce from private subsidiary holdings).

14. Weights are revised annually. Weighting is standard for all regions of Kyrgyzstan. The national index is aggregated from the weights of the regions, the computation of which reflects the relative expenditure and population of the different regions. A method of calculating the CPI is currently being devised that uses regionally differentiated weighting, because it has been observed that some commodity groups do not exist at this level (for example, some regions do not have mains gas supply). It is thought that this method of computing the index will enhance the accuracy of the regional indicators subsequently aggregated in the national index.

15. The set of goods includes goods in heavy demand and also some non-essential items (motor cars and vehicle maintenance, jewellery, etc.). Items with insignificant weights in the structure of consumption are necessary for making up subgroups (for example, postal rates).

16. The sample is fixed for a year. Brands, size and other characteristics may vary, but the basic definition of the good must remain unchanged until there is information pointing to significant changes in the good. More than 42,000 prices are recorded a month.

17. The criteria for deciding the number of prices to be recorded are the goods' weight in expenditure and price variation. More prices are recorded for goods characterized by high price variation and frequent consumption. Regional recorders at local level amplify the general descriptions of the most representative goods within the product subgroups.

18. Among the things that may lead to a change in the sample is the closure of retail outlets. If there is no information about a particular good because of the closure of a retail outlet, a new outlet is sought and a similar good whose price over the previous period can be identified is used as a substitute.

19. Sample adjustment is mainly effected through continuous monitoring of the relevance of the selected goods to the consumer. Therefore, at the time of annual reweighting, householder consumption patterns are analysed and any necessary corrections are made to the consumer basket used in the computation of the CPI.

## Quality adjustment

20. The best method of recording changes in quality and ensuring the comparability of goods at the time of recording is to use goods characteristics (specifications). Centrally devised and circulated specifications supply the price recorder with information about the characteristics of the good. However, when this information is too vague, the recorder must supplement it by noting additional characteristics of the good. The reasons for this are twofold. First, if a recorder is replaced, the new recorder will easily be able to find the good on the market the following month by referring to the precise description. Second, the specification and any additional description reflect those characteristics of the good that determine its value for the consumer. In the case of a washing machine, for example, these characteristics would be capacity, finish, degree of automation and spin cycle.

21. As long as prices are available for each good that matches a given specification, no problems arise. If certain monitored goods do not appear in a period, the most similar good must be selected and the differences in quality accurately measured. This information can then be used for quality adjustment, guaranteeing continuity in calculating the index.

## Methods of recording quality changes

22. If a monitored good disappears from the market, a computation is made of the correlation between the price of the substitute good and the price of the good previously used for monitoring purposes. Both varieties of the good are on the market over a long period, so their prices may be considered to be equivalent. Suppose that a recorder collecting price information during period 3 finds that monitored good 1 is no longer on sale. The problem is then resolved by switching to good 2. The recorder must obtain information about prices in both the second and third periods and take into consideration the price of good 2 when calculating the index. This procedure, often called “splicing”, may be summarized as follows:

Period	Good 1	Price relative	Good 2	Price relative
1	40			
2	41	1 025	50	
3			52	1 040

23. The good itself does not actually change; what changes is the form in which it is offered for sale (good 1 may be a 500 gram loaf of bread, whereas good 2 is a 600 gram loaf). Since both goods are on the market over a long period, it is assumed that the difference in their prices reflects consumers’ assessment of the extent to which they differ in quality.

24. If, however, both varieties of the good were not on sale over a long period, but were sold for a short time only, whereupon good 1 disappeared from sale, the recorder observes the following picture:

Period	Good 1	Good 2
1	40	
2	41	50
3		51

25. In calculating the index it is now impossible to take account of good 2, since it cannot be assumed that the difference in price reflects a difference in quality. The absence of heavy demand for good 2 during the period of overlapping sales means that buyers' evaluation of the new features of good 2 does not exceed the difference between 50 and 41 units, and the recorder must assume that the introduction of the new good signifies a price rise.

26. In such situations, it is important to determine how far the price change is due to a price rise, and how far it is due to a change in the quality of the good. The recorder must evaluate the additional "utility" or degree of satisfaction that the consumer derives from the new features of good 2.

27. Suppose, for example, that the duration of use of new good 2 exceeds the duration of use of good 1 by 20%. It may be said that, in respect of physical volume, the new good offers a 20% advantage over good 1 and that, if the new good is 20% more expensive, no price rise occurs.

28. But how to determine how far the quality of good 2 exceeds that of good 1? That is a fairly complex process. Goods are distinguished by how many basic functions they perform. Thus shampoo, detergents, lipstick and so on have just one function. But most goods have more than one function, and they can rarely be assessed in quantitative terms. Food satisfies hunger and gives aesthetic pleasure; clothing and footwear are visually and physically pleasing while affording protection against the elements, etc.

29. If, however, one good replaces another, it is essential to exclude from the price the influence, if any, of the quality of the new item. Accordingly, an adjustment for quality must be made as follows:

$$51/120\% = 44.5 \text{ (adjusted price of good 2).}$$

30. Thus, the quality component of the product is taken out of the price and the result obtained is compared with the price of good 1:

$$42.5/41 \times 100 = 103.7\%$$

From this it follows that the net price increase is 3.7%.

## Conclusion

31. The sample of goods and services is a representative selection of those goods and services most frequently consumed by the population, and is standard for all regions of Kyrgyzstan. It also includes certain non-essential goods and services (jewellery, motor cars, etc.). The representative goods are selected at the national level. Primary information for the centralized selection of goods is provided by data from household surveys showing the allocation of expenditures by families for acquiring goods and services under the "total population" category, and data on the circulation of the good. The selection process combines purposive and threshold selection. The sample of retail outlets is updated where necessary, and the sample of goods is updated annually when reweighting the base year. A method of calculating the CPI is currently being devised that uses regionally differentiated weighting.

32. Taking proper account of quality changes is important for the accuracy and reliability of the CPI. But only the producer of a good can make any reasonably accurate assessment of changes in its quality from the consumer's standpoint. So assessing quality is a fairly complex operation, and is sometimes beyond the capacity of a recorder or inspector. Accordingly, it is sound practice to monitor the greatest possible number of prices of goods of similar type (between three and seven, depending on price variation), thereby maintaining the reliability of the calculated index.

-----