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Item 12 of the provisional agenda

METHODOLOGY OF COMPUTING CPI IN ROMANIA STARTING WITH 1997

Paper submitted by the National Commission for Statistics of Romania¹

I. DEFINITION, COVERAGE AND UTILIZATION OF CONSUMER PRICE INDEX

Definition

1. The Consumer price index (CPI) measures the evolution of prices for purchased commodities and of tariffs for services used by the population in a certain period (called current period) as compared to a previous period (called basic or reference period).

Coverage

Reference population

2. The consumer price index is calculated based on population expenditures which relate to the purchases of commodities (food and non-food goods) and to the payment of services used to satisfy living needs. These expenditures refer to monthly average levels taken from Household Integrated Survey (HIS) carried out in 1995 by the National Commission for Statistics and the Ministry of Labour and Social Protection (Government Decisions no. 556/1992 and 323/1994). The survey was carried out within 501 research centres in 365 urban and rural areas representing all counties in Romania and in Bucharest Municipality. The sample used guaranteed the estimation of the main variables with 97% probability. Data collection relied on daily records made by the head of the selected household or another person from the household who was able to accurately record the necessary elements in the household diary. It

¹ Prepared by Mrs. Marcela Volintiru, National Commission for Statistics.
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also relied on the interview at the household domicile carried out by specialised statistical agents. The results were based on the information collected from those households which accepted to take part in the survey - 92% response rate. Money expenditures for purchases of food and non-food products and for payment of services were calculated as averages per household. They represented the background for the system of weighting the elementary indices of consumer prices.

Type of covered consumption

3. The consumer price index excludes:
- goods coming from other sources than purchases (stock, own-account production, gifts, etc.);
 - investment expenditures (dwellings, construction materials used to build new dwellings or capital repairs for old dwellings, etc.)
 - interest payments paid for credits, insurance rates, fines, gambling, taxes;
 - expenditures incurred for payment of labour in the household (ploughing, sowing, weeding, taking care of gardens, orchards of trees, vineyards, harvesting, haymaking, animals medical treatment).

Territorial coverage

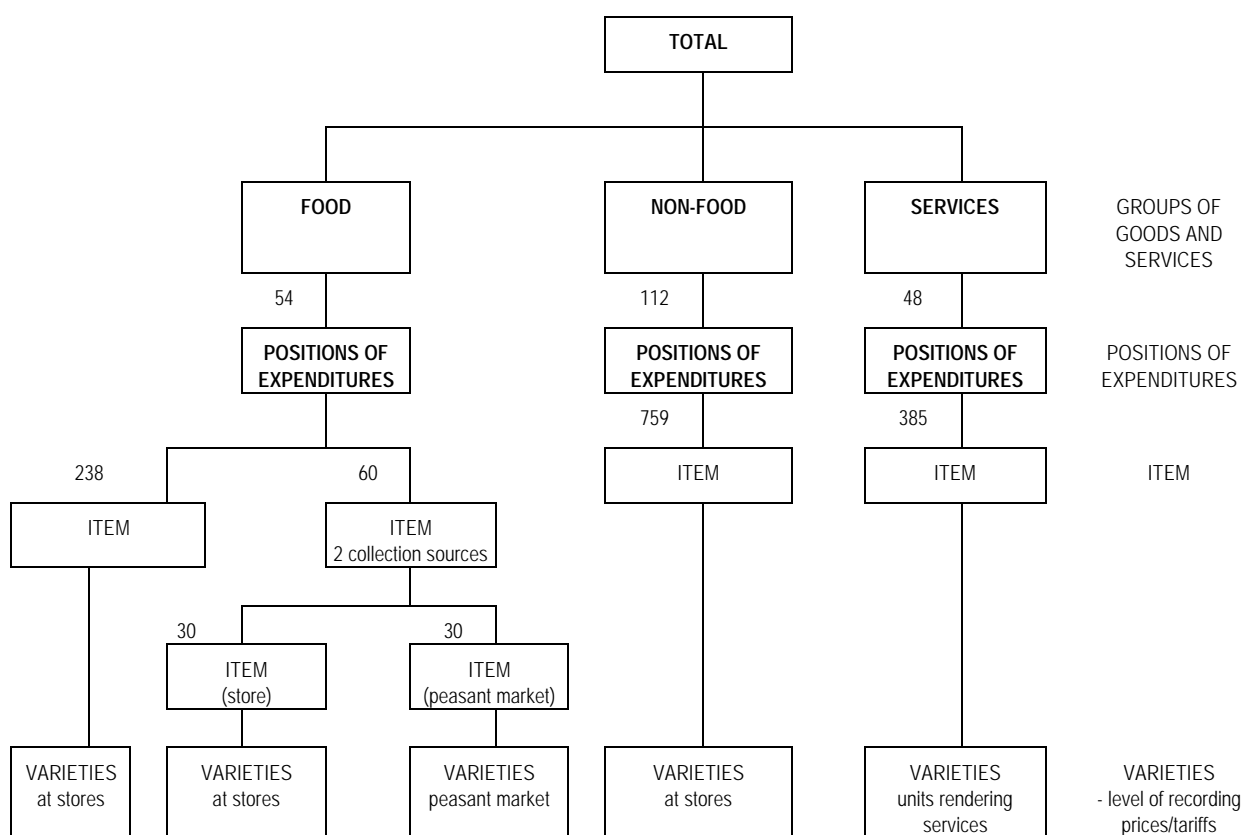
4. Consumer prices/tariffs are recorded in counties' municipalities (including Bucharest Municipality) and in the main urban settlements of all counties in our country.

Utilization of consumer price index

5. CPI is an essential indicator for the market economy. It is used to measure the inflation; to estimate the purchasing power of incomes, salaries and pensions; as basis for the real interest calculation; for deflation of some indicators in retail trade, services, national accounts. The index is used in the negociation of salaries, pensions, scholarships, allowances, etc. as well as for political decisions in the social area. It is an important indicator in carrying out international comparisons.

II. USED NOMENCLATURES

6. The nomenclature of food and non-food goods and services represents a tree, obtained by stratifying HIS expenditures by groups of goods (food, non-food) and services, positions of expenditures and items of significant weight in population structure. The structure of the nomenclature used in the CPI calculation is presented below:



7. The nomenclature of expenditure positions, on which relies the calculation of CPI, comprises 214 positions and identifies with the one used in the HIS with the exceptions mentioned in paragraph 3.

8. In order to characterize some positions of expenditures, as "Vegetables" or "Fruit", expenditures for component assortments were aggregated (example: for "Vegetables" the following expenditures were cumulated: potatoes, carrots, tomatoes, eggplants, onion, garlic, peppers, bellpepers, green beans, etc.).

9. The nomenclature of representative items includes 1442 items, selected on the basis of the following principles:

- homogeneity of goods/services items within the expenditure position;
- representativity of all expenditure positions for goods/services which are included in the HIS and are most present in the population current consumption;
- items of significant weight in the population consumption by custom, training level, education, culture, climatic conditions, family size and components;
- lower dispersal of elementary indices by items and expenditure positions.

10. When establishing the nomenclature those items within the position are chosen, which can assure the representativity throughout the whole year. If

one of the items is missing, the others should assure the position representativity.

11. The nomenclature of localities where prices are collected, is set up on the bases of information about the volume of goods sold and services rendered, as well as the number of inhabitants in these localities. It contains 41 municipalities, including Bucharest Municipality. Prices are observed in 68 collection centers (one center in 21 towns, two centers in 18 towns, three centers in Constanta Municipality and eight centers in Bucharest Municipality).

12. The prices of agrofood products sold on the peasant market are observed in 95 localities (including municipalities)

13. The sample of observation units was set up based on the volume of goods sold and services rendered, so that they should represent the whole range of representative goods and services. The units were selected as follows: if the same product is sold at various prices in the same type of store but in different sectors (public, mixed or private), the registration is done in the unit where several quantities of representative items are sold. The outlets and units rendering services where prices/tariffs are recorded, are kept in the nomenclature as long as possible in order to assure the continuity and comparability of data series.

14. The nomenclature of observation units is updated in agreement with the National Commission for Statistics on the bases of information provided by the registration agents, whenever they notice changes in the structure of goods sold (profile changes), elimination or merging of units, observing the representativity principles.

15. Two types of observation units are identified:

- stores, peasant markets and units rendering services where free prices are practised for food, agrofood, non-food goods and some services. This group contains about 5300 stores selling goods and units rendering services located in the main urban agglomerations and they have a significant volume of sales. About 3200 units are privately owned (over 60% of the total). The nomenclature of stores includes information on name, address, fiscal code, ownership type code, codes of items.

- units rendering services which have unique tariffs for the country, set on the basis of administrative decision (rail, air, river transport, mail and courier services, radio, TV subscriptions) or unique prices (electric and thermal energy, methane gas and central press).

III. PERIODICITY OF CONSUMER PRICES/TARIFFS OBSERVATION

16. The observation and registration of prices/tariffs in the stores and at the peasant markets is carried out on the 10th, 20th and 30th of each month, and the deadline for submitting data to NCS is the second working day after the reporting period, i.e. the 12th, 22nd, 2nd respectively.

IV. SURVEY QUESTIONNAIRES

17. The observation and registration of prices and tariffs is done with the help of questionnaires which are submitted to the regional statistical offices and to Bucharest Municipality Statistical Division, one for each category: food, non-food goods and services, one set for each of the 68 data collection centers.

18. The questionnaires contain three types of information, namely:

a. Preprinted information: code and name of expenditure position (products/services); for each position, the component item has the following elements: code of item; name and technical/functional characteristics; measurement unit; decades.

b. Information completed for each item by the statistical agent when receiving the questionnaire: price/tariff in the basic period; type of outlet/unit rendering services (public sector, private sector, mixed sector).

c. Information recorded by the statistical agent every 10 days in the observation unit: nominal price/tariff observed by varieties.

19. The information collected with the statistical reports on "Prices and quantities of agrofood products sold by agricultural producers on the peasant market" refer to: code and name of products, measurement unit, actual prices and quantity sold during the reporting period. Data about quantities sold are taken from the "notebook of daily records of agrofood products sold on the peasant market", filled in by the markets' administration.

20. The questionnaires with the unique prices for the country are completed by the price agents on the basis of the normative administrative documents published in the official state newspaper and approved by the Ministry of Finances and by the Competition Office.

V. TECHNIQUE OF DATA OBSERVATION AND RECORDING

21. The interviewer of prices has a very important part in the survey. He observes and follows the general rules and principles necessary to carry out the survey. The statistical interviewer has to study the nomenclature of products and services, for which nominal (individual) prices are recorded. He is obliged to visit the outlets throughout the whole year and to record the prices/tariffs. He informs about any problems which could disturb the normal conducting of the survey. The interviewer follows strictly the general rules regarding data observation, recording and transmission of data.

22. The lists of outlets and units rendering services, and the nomenclature of products and services are confidential and cannot be shown to any person, with the exception of those involved in the CPI calculation.

23. The observations are compulsory. The interviewer has to respect the

schedule for the observation of the prices. The schedule is set up by outlets and units rendering services, by their territorial distribution and by the frequency of collection of the prices/tariffs.

24. The selection of outlets (stores, shops) and units rendering services is done on the basis of criteria set up by the NCS, the regional statistical offices and the General Statistical Division of Bucharest Municipality.

25. The nomenclature of goods and services is followed strictly. The items are identified by functional features in the questionnaires. The prices recorded in the notebook are the nominal prices recorded on the reporting dates and refer strictly to the respective item taking into account its technical characteristics described in the notebook.

26. Retail prices are recorded only for items included in the questionnaire. The prices of goods kept in stock, as well as goods exchanged as barter between producers are not recorded. The prices for some imported food products (apples, pears, melons) are not recorded if there are prices of similar goods produced in the country.

27. Seasonal assortments are included in the observation when they appear: from the month a rhythmic observation of prices can be observed till the end of the season. The prices for early vegetables and fruit are not recorded.

28. The observation of maximum number of prices for each item in each observation outlet and unit is required, so that the interviewer is able to assure the observation of the prices every ten days in order to follow the real movement of the prices during the month.

29. If during the period of ten days prices are changed due to administrative documents (example: transport of passengers, fuels, water, etc.), an average price is calculated for that period. It is computed as an weighted average of the old and new price, the weights being the number of days in the ten days period. The calculation formula is as follows:

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1

where:

p_o = old price (before change);
 n_o = number of days of reporting period where old price was available
 p_n = effective new price, available after the change;
 n_n = number of days left in the reporting period where new price was available

30. To assure the continuity of data series it is required that the same variety of a certain item is kept in the observation which should correspond to the following conditions: has the best sales (as volume); the continuity of observation in the time can be assured; is the most closed to the technical characteristics of the item included in the nomenclature.

VI. AUTOMATIC DATA CONTROL, ANALYSIS AND CHECKING

31. After receiving the data files sent by Statistical County Offices and Statistical Division of Bucharest Municipality, data are automatically controlled, as follows:

- integrality - checks if all counties have sent data files;
- compatibility - checks if files structure corresponds to the structure of centralised processing as well as to the month of data processing (current month).

The files accepted after automatic control are used later to calculate the information, necessary for the analysis carried out by the statisticians responsible for the survey. These information consist of;

- amplitude of variation (i_{\min} , i_{\max}) represents the distance between minim and maxim index for each assortment;
- amplitude of variation separated in 5 equal intervals;
- standard relative variation at the level of each observation point.

VII. THE ALGORITHM OF COMPUTING THE CONSUMER PRICE INDEX

32. The used index is of Laspeyres type, with weights from 1995. The general formula to calculate the Laspeyres type index is as follows:

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33. CPI calculation supposes the following stages:

Price index calculation at variety level:

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click here to view equation. 4= price of i variety recorded in current month;

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click here to view equation. 5= annual average of i variety prices in 1995.

The price of i variety recorded in current month

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(click here to view equation. 6) is calculated as a simple mean of these three monthly recordings, as follows:

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where:

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8 = nominal prices afferent to the three
periods of current month for v_i
variety

34. In order to determine the annual average of variety v_i prices in 1995
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9, the following stages should be followed for the
items which already exist in the nomenclature:

- calculation of average prices related to the varieties by months in
1995;

- imputation of monthly average prices for all varieties without any
records of prices,

- calculation of annual average prices at the level of varieties by
simple arithmetic mean of monthly average prices in 1995;

35. For the new items introduced in the nomenclature another procedure is
followed:

- releasing the new items in December 1996 and recording prices related
to December 1996;

- assimilating the new assortments with those already existent in the
nomenclature (in the case of expenditure positions with homogeneous
structure) or directly with expenditure positions (in the case of
nonhomogeneous positions);

- calculation of the basic average price at the level of variety by the
ratio of price in December 1996 and price index assimilated at the level of
item or position (the last one is calculated as the ratio of average prices
in December 1996 and annual 1995).

Calculation of price indices at assortment level, as an arithmetical
mean of indices at variety level, by the formula:

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10 n # 68

n = number of centers for price / tariff collection;

Calculation of aggregate indices at expenditure position level, as
weighted arithmetical mean of price indices relating to items contained in
the expenditure position using the formula:

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where:

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12 = weight (relative importance) of items s_i
in total consumption expenditures in
1995;

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13 = amount of item weights within expenditure

position for which prices were recorded
in current month.

Calculation of indices at groups level: food, non-food goods and services as weighted arithmetical mean of indices at expenditure positions level included in the group:

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click here to view equation. 15 = price index at level of group in current month
(1) as against 1995 average;

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click here to view equation. 16 = price index at position level in current month
(1) as against 1995 average;

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click here to view equation. 18 = weight of goods and services group.

Calculation of general consumer price index as weighted arithmetical mean of indices at groups level:

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Calculation of indices of current month to the previous month are calculated by the ratio of fixed base indices, for all levels of aggregation, with the general formula:

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Annex

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