National Statistics Office of Georgia
(Geostat)

Approved by Resolution # 3 of the Board of
The National Statistics Office of Georgia
February 15, 2013

*Last updated: December 27, 2021*

# Consumer Price Index

# Technical Manual

Tbilisi 2013

The presented technical manual is prepared by the National Statistics Office of Georgia according to the international methods and practices and is based on the following handbooks:

1. *Consumer Price Index Manual, Concepts and Methods, International Monetary Fund and others, Washington 2020;*

   **Responsible organizations:** International Monetary Fund (IMF), International Labor Organization (ILO), Organization for Economic Co-operation and Development (OECD), European Statistical Office (Eurostat), United Nations (UN), European Bank for Reconstruction and Development (EBRD), World Bank;

   https://www.ilo.org/public/english/bureau/stat/guides/cpi/CPI_Manual.html

2. *Practical Guide to Producing Consumer Price Indices, United Nations, New York and Geneva, 2009;*

   **Responsible organizations:** United Nations Economic Commission for Europe, International Labor Organization (ILO), International Monetary Fund (IMF), Organization for Economic Co-operation and Development (OECD), European Statistical Office (Eurostat), United Nations (UN), World Bank, Office for National Statistics of United Kingdom;

   https://www.unece.org/fileadmin/DAM/stats/publications/Practical_Guide_to_Producing_CPI.pdf

3. *Consumer Price Indices", Ralph Turvey, International Labor Organization, 1993.*

4. *Harmonised Index of Consumer Prices (HICP), methodological manual, Eurostat, Luxembourg, 2018.*
   Responsible organization: Statistics Office of the European Union (Eurostat).

   https://ec.europa.eu/eurostat/documents/3859598/9479325/KS-GQ-17-015-EN-N.pdf/d5e63427-c588-479f-9b19-f4b4d698f2a2

# Contents


**1. Introduction** ..... **4**

1.1 Consumer Price Index and its use ..... 4

1.2 Harmonised Index of Consumer Prices and its use ..... 4

1.3 Coverage of the CPI ..... 5

**2. Sampling of outlets and representative items of goods and services** ..... **5**

2.1 Sampling of outlets ..... 5

2.2 Sampling of representative items of goods and services ..... 6

**3. Price collection fieldwork** ..... **6**

3.1 Number of prices and timing of price collection ..... 6

3.2 Methods of price collection ..... 7

*3.2.1 Local price collection* ..... *7*

*3.2.2 The central price collection* ..... *9*

*3.2.3 Collection of centrally fixed prices* ..... *9*

*3.2.4. Web scraping* ..... *9*

*3.2.5 Scanner data.* ..... *9*

3.3 Item replacement ..... 10

3.4 Comparability criteria ..... 11

**4. Price imputation techniques** ..... **11**

**5. Quality adjustment** ..... **12**

**6. Data Validation** ..... **14**

**7. Weights** ..... **14**

**8. Calculation of the CPI on different levels** ..... **15**

8.1 Calculation of the elementary aggregate index ..... 15

8.2 Calculation of the CPI for separate groups and whole consumer basket on city level ..... 17

8.3 Calculation of the CPI on national level ..... 17

8.4 Chain index ..... 18

8.5. Core inflation ..... 18

**9. Publication** ..... **19**

9.1 Press release ..... 19

*9.1.1 Contributions of the different groups to the percentage change in all-items CPI* ..... *19*

9.2 Time series data for CPI ..... 21

# 1. Introduction

## 1.1 Consumer Price Index and its use

The Consumer Price Index (CPI) measures average price level of the goods and services acquired by consumers compared to the reference period.

Goods and services acquired by consumers are represented by the fixed consumer basket, which reflects a structure of consumption expenditures for an average consumer. Goods and services in the consumer basket are selected based on the data of National Accounts and Integrated Household Survey. The consumer basket is grouped according to the Classification of Individual Consumption by Purpose (COICOP).

The consumer price index is used for the following purposes:

1. The CPI is the only index used to **measure inflation rate** in Georgia. The CPI is a key factor for inflation targeting;
2. The CPI plays an important role in the process of indexation of the amount of incomes, social assistances, contracts, etc.;
3. The CPI is used as a deflator to eliminate the influence of inflation while calculating different economic indicators.

## 1.2 Harmonised Index of Consumer Prices and its use

In addition to this index, Georgia also produces a Harmonized Index of Consumer Prices (HICP). It is mainly used by EU member states and is an important indicator of price stability. Thus, the calculation and dissemination of this indicator has great importance in terms of approximation to EU standards.

The HICP is based on a unified, harmonized methodology and regulations developed by the statistical office of the EU– Eurostat. When calculating the index, their strict observance is mandatory to ensure the international comparability of the index.

For the purposes of this index, the European version of the "Classification of Individual Consumption by Purpose" - ECOICOP is used.

### 1.3 Coverage of the CPI

The Consumer Price Index reflects changes in expenditures on goods and services acquired for private consumption by residents within and outside of the territory of the country. In contrast, coverage of the HICP includes expenditures on goods and services acquired for private consumption by residents and non-residents only on the economic territory of the country.

The index does not cover expenditures of government or institutional households (hospitals, prisons, shelters, etc.).

Prices are collected in retail outlets in six major cities of Georgia: Tbilisi, Kutaisi, Batumi, Gori, Telavi and Zugdidi. The consumer basket is identical for all six cities. In addition, the consumer basket and geographical coverage of price collection is identical for the National Consumer Price Index and for the HICP.

## 2. Sampling of outlets and representative items of goods and services

### 2.1 Sampling of outlets

Information about the active business entities is used as a data source for outlet sampling. Sampling is conducted for each city, based on the commodity groups represented in the basket (in some cases for individual goods and services). Sequential *pps* (probability proportional to size) sampling method is applied for outlet sampling using the following formula:

$$Q_i = \frac{U_i}{z_i}, \text{ where:}$$

$Q_i$ is a ranking variable;

$U_i$ - a random number;

$z_i = \frac{n \times x_i}{\sum x_i}$, where:

- $n$ is a desired number of outlets;
- $x_i$ – annual turnover of outlet $i$.

After calculating $Q_i$ ranking variables for each outlet, they are sorted in an ascending order and the first $n$ units are included in the sample. Selection of outlets according to the districts of the city is also taken into consideration during the sampling process.

A selected outlet that is not suitable for the survey is replaced by the next one in the sample list. The same method is applied to outlets closed down during the survey period. Updating of outlet sample is conducted annually.

### 2.2 Sampling of representative items of goods and services

After completion of outlet sampling, market survey is conducted to determine the most commonly sold representative items of goods and services included in the basket. Thus, most demanded representative items are selected for price collection. Price changes of the representative items reflect dynamics of consumer prices and tariffs.

Detailed specifications, used in the process of price registration are determined along with the selection of representative items. Observance of specifications is an important part of price registration, as the index should reflect pure price change of an identical item, rather than price changes caused by variations in characteristics, or an item itself. Sometimes it is convenient to have broad specifications in order to follow frequent changes in market demand. For example, specifications are broad for clothing, as there are frequent changes in fashion and in detailed specifications.

Standard measurement units of goods and services are defined along with their specifications. Standard prices of representative items are calculated based on their standard units, which are used in the process of data validation and logical control by price collectors and the central office.

## 3. Price collection fieldwork

### 3.1 Number of prices and timing of price collection

Number of observable prices depends on price variability for each good or service, as well as its weight in the consumer basket. Number of observations is 6-12 for most of the goods and services in each city; due to frequent changes in characteristics of electronic goods (e.g. computers, mobile phones), number of observations is 20-25 to ensure sufficient quantity of comparable prices. In case of insufficient number of proper outlets in a given city the number of observations may be less than 6. For tariffs and public utility fees there may be only one observation.

Price collectors register consumer prices during the same dates from the 10$^{th}$ to the 20$^{th}$ of each month (in case of scanner data - in the period of 1-10$^{th}$ of the month - see 3.2.5).

*Special cases:*

Prices of used cars are registered on the last weekend of the price collection period. The reason is that the market for used cars intensively operates during weekends (Saturday and Sunday). Therefore, prices are registered on the same day of the week instead of the same date of each month.

Regular special offers may take place in the outlet on the same day of the week. The prices are registered in such an outlet on the sale day nearest to the date of previous price registration.

Prices of perishable goods (fruits and vegetables) are collected between 11-16 pm due to possible significant difference between the prices registered in the morning and in the evening.

An outlet may be closed temporarily (for one or several days) for various reasons (stock account, repair, etc.). After identifying the duration of outlet closure, price collector registers prices on the next day or on the predefined day of the next month according to the reason.

In special cases (on holidays, etc.), prices can be collected two days before or after the predetermined date.

## 3.2 Methods of price collection

There are two main methods of price collection: local price collection and central price collection.

**3.2.1 Local price collection** is used for most of the goods and services represented in the consumer basket. It can be conducted in the following ways:

- Price enumerators personally visit sampled outlets and register prices for predetermined goods or services;
- Price enumerators register prices for predetermined goods or services using the relevant websites;
- Price enumerator registers prices by telephone. Such goods and services include:
    - Transport services (train tariffs, air flight fees, tariffs for public road transport);
    - Communication (monthly telephone fees, intercity telephone call tariffs, mobile phone tariffs, tariffs of internet connection services);
    - Cable TV fee;
    - Public utility fees (natural gas fee, water fee, electricity fee, garbage collection fee);
    - Medical services (therapist's and dentist's services, surgeon and childbirth services, blood tests);
    - Tourist trip abroad, etc.

Prices for goods and services are collected in the following types of retail outlets:

- Retail markets and market-type outlets;
- Stores;
- Supermarkets;
- Specialized stores and retail chains;
- Newsstands;
- Household service establishments;
- Recreation and entertainment facilities;
- Health and education institutions;
- Catering, etc.

A price collection process is characterized by certain features according to the types of retail outlets:

Price enumerator behaves as an ordinary customer when collecting prices at markets. After asking 3-5 prices to different sellers, price enumerator registers the most common, so-called dominant price.

In stores or supermarket-type outlets price enumerators register label prices or directly ask a price consultant. Availability of an item at the outlet also should be clarified. In case some items of goods (services) are missing for three consecutive months (12 months in case of seasonal items; see 3.3) in a specific outlet, a price enumerator substitutes such items with comparable items and makes a comment in the questionnaire about characteristics of the replacement item. The price of the replacement item is registered in the third month since the old representative item became unavailable.

The prices registered for index calculation include a service fee added to some of the consumer basket items (e.g. restaurant lunch fee, coffee in café, etc.). Therefore, price enumerators register prices including service surcharge.

*Special cases:*

A discount price is collected only if it applies to an item of the same quality that was observed in a previous period and if the discount price is available to all consumers. Discounts restricted to particular groups or connected to sell out product stocks deteriorated in quality or damaged, should be ignored.

*Offering temporary bonuses, extras and gifts:*

- In case of offering additional quantity (e.g. “buy 2 get 1 free”, or “extra 20% for free”) when size or weight is changed, the extra quantities are not regarded in the price;
- The price of an item is not registered, if its price cannot be identified separately, as it is represented as a bundle with other different item(s).

If special offers become permanent, price enumerators inform central office of Geostat, about the changed characteristics to take it into account.

Loyalty rebates using special cards, associated with the previous expenditures at the outlet are disregarded. Also, price reductions for credit card payments are excluded.

**3.2.2 The central price collection** is conducted by representatives of headquarters. This method includes centrally fixed prices which can be obtained from the headquarters of retail objects. In case of central price collection, checks are made to ensure that goods and services in question are actually available and sold in a specified outlet of a corresponding city.

**3.2.3 Collection of centrally fixed prices** considers price registration of goods and services that have the same price across the country or represent production sold in the chain shops in the whole country. Such prices are registered either by price enumerators or central office and the price is extended across other cities. Such kinds of prices are collected for the following items:

- Pharmaceutical products;
- New and used cars;
- Fuel (gasoline, diesel);
- Train tariffs;
- Air flight fees;
- Mobile phone tariff;
- Banking service fee;
- Intercity telephone call tariff, etc.

**3.2.4. Web scraping - automated download of data from the websites of trade / service outlets.** This is a relatively new method of data collection that allows downloading large amounts of detailed data in a short period of time from websites of trade/service outlets, based on an agreement with them. Web scraped data is later used for analysis and calculation of inflation. At this stage, web scraping is used for certain groups of consumer baskets, such as electrical appliances and used cars.

**3.2.5 Scanner data.** Scanner data is the part of the so-called "Big Data". This is information about products sold in a specific period of time, according to the so-called barcodes, received from retailers. Compared to traditional methods of price collection, this type of data is much more

accurate, timely and has wider coverage. Its use significantly increases the accuracy of the inflation rate. An example of the scanner data is given below.

*Table 1. Example of scanner data.*

| Period | Region (City) | Product Code (EAN) | Product Description | Category | Quantity sold (pieces) | Total product turnover (GEL) |
|---|---|---|---|---|---|---|
| 05.2020 | Tbilisi | 486123456789 | Sour cream "Brand A", 20%, 400 grams | Milk Products | 100 | 340 |
| 05.2020 | Batumi | 486685431842 | Mineral water "Brand B", in a plastic bottle, 1 liter | Water | 420 | 450 |

Scanner data has monthly periodicity and includes data on sales of 1-10$^{th}$ of the month, by trade chains and cities.

### 3.3 Item replacement

If there are no prices for a specified representative item for three consecutive months (12 months for seasonal items), it is replaced by a similar item. A replacement item should be qualitatively and quantitatively similar to the replaced one.

The replacement item should be selected in the same outlet, where the old one is missing. If the replacement item cannot be selected in the same outlet, price enumerator looks for it in another nearby outlet, which is of the same type and is included in the sample.

*The item is seasonal, if*:

- it is not available on the market during certain periods of the year;
- it is available on the market throughout the year, but its price fluctuates sharply across the seasons of the year.

Seasonal items can include fruits, vegetables, clothes and footwear, entertainment services. Prices of such items are registered during the corresponding season of the year. In other seasons a price index is calculated using imputation techniques (see ch.4).

### 3.4 Comparability criteria

Comparability criteria should be taken into account to make sure that a price index does not reflect change in quality as price change. Comparable item should satisfy pre-defined specifications of the consumer basket. While comparing the representative items in the current and previous periods, price enumerators observe the following rules:

- Two items are not comparable if they are represented in two different outlets;
- Two items are not comparable if they are produced in different countries;
- It is possible to compare two similar products with approximately the same characteristics and quality (e.g. in case of clothes when the only difference is color);
- In case of replacement, if the difference between sizes or weights of the old and new representative item is essential, a replacement item is added to the basket as a new representative item. Otherwise, a replacement item is considered to be comparable.

## 4. Price imputation techniques

If an item is missing, its price should be imputed. Imputed prices are calculated by multiplying the price of this item in the previous period by the elementary aggregate index in the reporting period (see Ch 8.1), that is a geometric mean of the ratios of comparable item prices. If there are no elementary aggregate prices comparable to the previous period, an upper level group index is used for price imputation.

For example, if there is no price in March for a representative item (brand D), the price is imputed in the following way (table 2):

*Table 2*

| Representative item | Price in February | Price in March | Price Ratio |
|---|---|---|---|
| Brand A | 7.00 | 7.00 | 1 |
| Brand B | 6.50 | 6.90 | 1.06 |
| Brand C | 7.00 | 7.20 | 1.03 |
| Brand D | 6.00 | - | |
| **Geometric mean of price ratios of comparable prices (elementary aggregate index)** | | | **1.03** |

$$\text{Elementary aggregate index of comparable prices} = (1 \times 1.06 \times 1.03)^{\frac{1}{3}} \approx 1.03$$

$$\text{Imputed price for brand D} = 6 \times 1.03 = 6.18$$

When the item reappears on the market, the previous month's imputed price is considered to be comparable to the current period's price.

## 5. Quality adjustment

When an item is missing and the replacement item is qualitatively or quantitatively different from the old one, a quality adjustment method should be used to compare the prices.

When a price enumerator is informed in advance that an item will be missing or an outlet will be closed in the next month, an **overlap method** is used for quality adjustment. According to this method, prices are collected for both replaced and replacement items in the reporting period. The price difference between the two items is considered to be the value of the quality difference. The price of the old item is used in index calculation of the reporting period, while the price of the replacement item is used for calculating the next period's index.

For example, in March a price enumerator is informed that brand C will be missing in April. The enumerator registers the price of a replacement item (Brand D) in March, which is used in the April index calculation (Table 3).

*Table 3.*

| **Representative item** | **Price in February** | **Price in March** | **Price in April** | **Price Ratio (March/February)** | **Price Ratio (April/March)** |
|---|---|---|---|---|---|
| Brand A | 5.00 | 5.00 | 5.20 | 1 | 1.04 |
| Brand B | 4.50 | 4.80 | 5.00 | 1.07 | 1.04 |
| Brand C | 4.50 | 4.50 | - | 1 | |
| Replacement item - Brand D | | 5.20 | 5.50 | | 1.06 |
| **Geometric mean of ratios of comparable prices (elementary aggregate index)** | | | | **1.02** | **1.05** |

Correspondingly, elementary aggregate indices for March and April are calculated as geometric means of ratios of comparable item prices:

$$I_{03} = (1 \times 1.07 \times 1)^{\frac{1}{3}} = 1.02$$
$$I_{04} = (1.04 \times 1.04 \times 1.06)^{\frac{1}{3}} = 1.05$$

If an item is missing for three consecutive months (12 months in case of seasonal items), enumerator follows the same replacement procedures as outlined in Paragraph 3.3. Table 4 represents an index calculation example in case of replacing a missing item.

*Table 4.*

| Representative item | Price in February | Price in March | Price in April | Price in May | Price in June | Price Ratio(June/May) |
|---|---|---|---|---|---|---|
| Brand A | 5.00 | 5.00 | 5.20 | 5.40 | 5.40 | 1 |
| Brand B | 4.50 | 4.80 | 5.00 | 5.00 | 5.20 | 1.04 |
| Brand C | 4.70 | 4.85* | 5.05* | 5.15* | | |
| Replacement item - Brand D | | | | 5.20 | 5.50 | 1.06 |
| **Geometric mean of ratios of comparable prices (elementary aggregate index)** | | **1.03** | **1.04** | **1.02** | | **1.03** |

* Imputed price (calculated using non-rounded numbers)

Elementary aggregate indices for March, April and May are calculated only by the geometric means of comparable item price ratios that are used in the process of price imputation for brand C. In May, price enumerator registers the price for replacement item that is used for index calculation in the next month. The price difference between Brands C and D registered in May is treated as the value of the quality difference.

## 6. Data Validation

Data validation is done in two stages:

**At the first stage** price validation takes place simultaneously with price registration field work. If an observed price does not fall in the predetermined relative price range, built-in software controls alert a price enumerator to check the price. Price enumerators confirm the accuracy of the price by making an appropriate comment. The data is sent to the central office on the same day of price registration and a central office worker, responsible for the specific city, analyzes the data. If necessary, the price is checked by the price enumerator.

**At the second stage** primary data analysis is carried out by the central office after calculating the indices and average prices. During the second stage of validation the following analysis is performed:

1. Elementary and group indices for all six cities are compared and significant deviations from the average rate are checked;
2. Dynamics of average prices and detailed indices are analyzed.

Irrespective of the number of comparable prices registered in each city, an elementary aggregate index is considered to be reliable if it passes the above validation checks.

## 7. Weights

The weights for the groups or goods and services represented in the basket are based on the consumption structure derived from the national accounts data and reflect the latest expenditure pattern across the country. Additional source for the weight calculation is the information received from the Integrated Household Survey. The final data on weights represents the share of monetary expenditures on goods and services in the overall monetary consumer expenditures.

Weights for each city are calculated as shares of monetary consumer expenditures of the corresponding region in the total consumer expenditures. The city weights are also based on the national accounts' data and the household survey information.

The weights are updated annually based on the newest information received from the above sources. Weights for period *t* are calculated based on the information from period *t-2*. For example, weight reference period for 2012 is 2010. The list of goods and services represented in the consumer basket may also change while updating the weights.

When calculating the HICP weights, so-called „price updating“ of weights is additionally used. At this time the expenditure data for the t-2 period are adjusted according to the price changes between the t-2 and t-period. This approach has two main reasons:

- To provide a comparable, harmonized process of calculation between countries. In the case of the same weight reference period, it is possible to aggregate and analyze the HICP between countries.
- To bring into line the weight and price reference periods. Since the information about expenditures becomes available relatively late, the weights reference period (t-2) precedes the price reference period (December t-1). As a result of the price updating, these two base periods are aligned.

It should be noted that price updating of the weights is not an alternative to regular weights update as it does not change the amount of consumption.

# 8. Calculation of the CPI on different levels

## 8.1 Calculation of the elementary aggregate index

The goods and services in the consumer basket are represented by specified aggregates of representative items that are the base for calculating elementary index at the city level. Diagram#1 shows the structure of the consumer basket for a city, where the elementary aggregate index is represented by the following elementary aggregates: rice, buckwheat, etc. Short term index for elementary aggregate is the ratio of geometric mean of *t* and *t-1* period comparable item prices:

$$I_i^{t/t-1} = \left( \prod_{j=1}^{n} \frac{p_j^t}{p_j^{t-1}} \right)^{1/n} = \frac{\left( \prod_{j=1}^{n} p_j^t \right)^{1/n}}{\left( \prod_{j=1}^{n} p_j^{t-1} \right)^{1/n}}$$

where:

$I_i^{t/t-1}$ is a period *t* index for elementary aggregate *i* compared to previous *t-1* period;

*j* – a representative item for which a comparable price is registered;

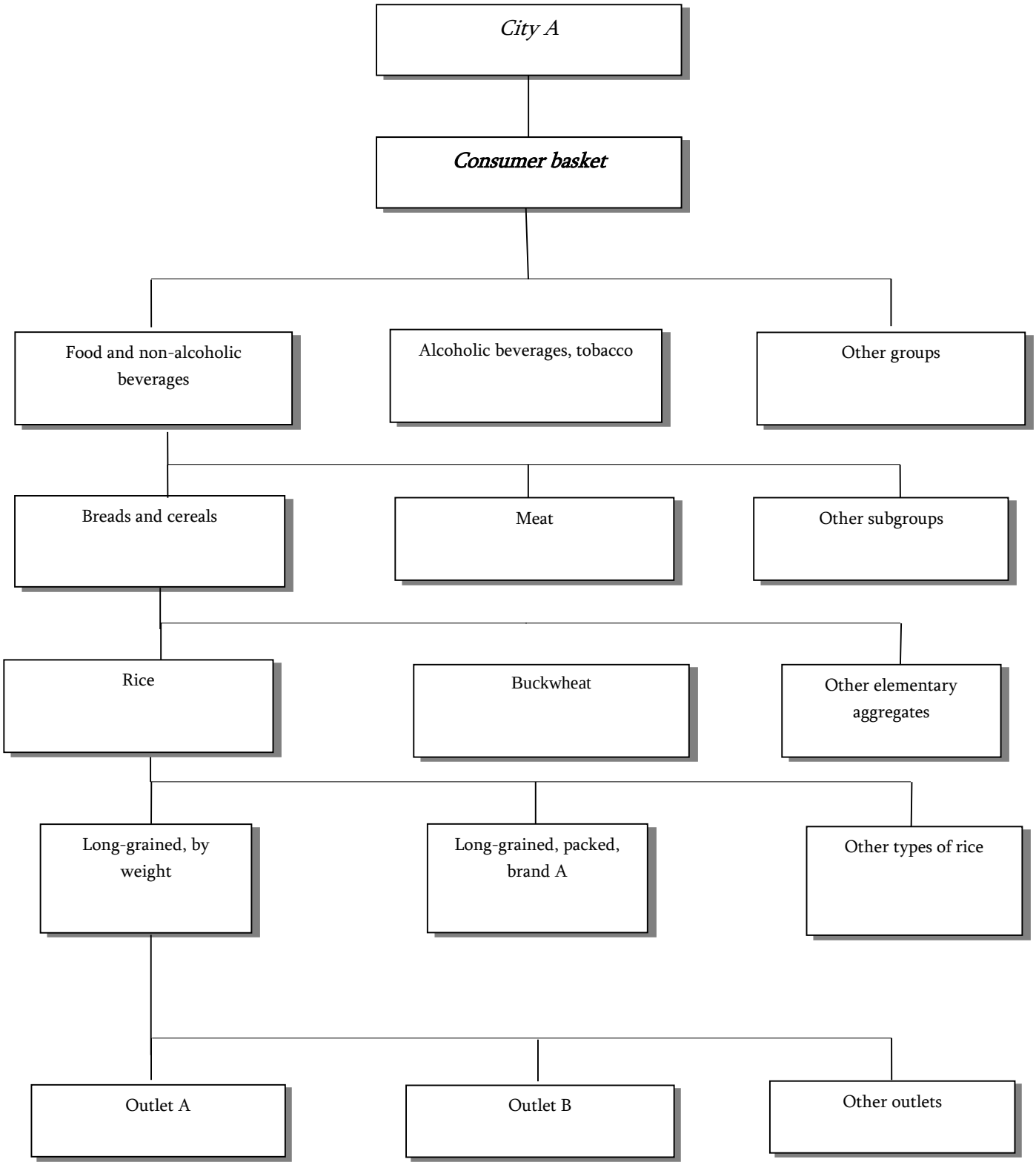
$p_j^t$ – price of a representative item *j* in period *t*;

$p_j^{t-1}$ - price of a representative item *j* in period *t-1*.

Long term index for elementary aggregate compared to the price reference period is calculated by multiplying short term elementary aggregate indices.

National index is calculated by weighting the city indices with the corresponding city weights.

Diagram#1. Structure of the consumer basket for a city



### 8.2 Calculation of the CPI for separate groups and whole consumer basket on city level

Long-term CPI compared to the price reference period is calculated using the following Laspeyres-type formula:

$I^{t/0} = \sum_{i=1}^{n}\left(I_i^{t/0}\right) \times s_i^b$, where:

$I_i^{t/0}$ is a long-term index for the i-th elementary aggregate in period *t* compared to the price reference period (0);

$s_i^b = \frac{p_i^b q_i^b}{\sum p_i^b q_i^b}$ is the weight of the i-th good (service) in the weight reference period that represents an expenditure share on the i-th good (service) in the whole consumer expenditures, where $\sum_{i=1}^{n} s_i^b = 1$.

$p_i^b$ - the price of the i-th good (service) in the weight reference period (b);

$q_i^b$ – quantity of the i-th good (service) consumed in the weight reference period (b).

The same formula is used while calculating higher level aggregate indices at the city level. A higher level aggregate index is calculated by weighting the long term elementary aggregate indices within the higher level aggregate compared to the price reference period, where the sum of the weights equals 1.

Short term indices for separate aggregates or for the whole consumer basket, compared to previous month, are obtained from the ratios of long term indices, compared to the price reference period, in the reporting and reference periods.

### 8.3 Calculation of the CPI on national level

A national level index is a weighted arithmetic mean of elementary or higher level aggregate indices calculated for individual cities, where weights represent city shares.

National level index calculation methods are similar to those for city indices. Short term indices compared to the previous month at the national level are calculated as the ratios of long term indices compared to the price reference period in the current and the previous months.

### 8.4 Chain index

During the annual update of the basket and specifications of goods and services in December, the prices are collected for both old and new consumer goods and services. This enables linking of two different baskets. Chaining provides for calculation of higher level aggregate indices with respect to any base period, notwithstanding the changes in the weights or basket components.

For example, before December 2011 the all-items indices with price reference period of 2009 were calculated using $w_i$ weights and from the beginning of 2012 indices with price reference period of December 2011 are calculated using $k_i$ weights (see table 5).
$X_1$ (table 5.) is the chain index for January 2012 with the reference period of December 2009. Calculation of this index can be represented as follows:

*Table 5.*

| 12.2009=100 | 12.2011=100 |
|---|---|
| 12.2011: $I^{12.11/12.09} = \sum_i I_i^{12.11/12.09} \times w_i = 106$ | 12.2011: $I^{12.11/12.11} = 100$ |
| $X_1$ | 01.2012: $I^{01.12/12.11} = \sum_i I_i^{01.12./12.11} \times k_i = 102$ |

$$\frac{106}{X_1} = \frac{100}{102}, \text{ where } X_1 = \frac{106 \times 102}{100} \approx 108$$

The same result can also be derived from the following chain linking:

$$I^{12.2011/12.2009} \times I^{01.2012/12.2011} = 106 \times 102/100 \approx 108$$

## 8.5. Core inflation

Core inflation is an inflation indicator which shows the underlying trend in inflation by excluding price volatility of seasonal component and the products with highly variable prices. Purpose of core inflation is to represent main dynamic of inflation, which makes it a significant analytical instrument for assessing inflation processes in the country.
Core inflation is calculated based on the overall inflation rate calculated by consumer price index, using the same structure of weights and type of formula. According to one of the methods of international organization's methodology, core inflation is obtained by excluding certain goods and services from consumer basket.

In Georgia core inflation is calculated by excluding the following goods and services from the consumer basket:

- Food and non-alcoholic beverages;
- Tobacco (in certain cases);
- Energy (gasoline, diesel, gas fuel, liquefied gas, firewood);
- Administered prices (water, garbage collection, electricity and natural gas);
- Transport (suburban and long distance train, suburban bus and intercity motor transport, intercity taxi and air flight).

# 9. Publication

## 9.1 Press release

Press release for the CPI is published on the Geostat's web-site every month, covering the information about monthly and annual inflation rates, as well as contributions of the groups to the index formation. It also includes different time series graphs.

### 9.1.1 Contributions of the different groups to the percentage change in all-items CPI

Group contributions to the percentage changes in all-items index provide a powerful tool for analyzing the CPI. The contribution of a component over a given period is defined as the percentage change in the overall CPI caused by the change in the index of the given component only, ceteris paribus.

The following formula is used for calculating the contribution of price change of item *i* to the index at the city level:

$$\left(\frac{I_t^i - I_{t-1}^i}{I_{t-1}^a}\right) \times w_t^i \times 100$$

where:

$I_t^i$ -index for component *i* in period *t*;

$I_{t-1}^i$- index for component *i* in period *t -1*;

$I_{t-1}^a$ - all-items index in period *t -1*;

$w_t^i$-weight of component *i* in the consumer basket of period *t*.

In case of changes in weights between two periods, the contribution of component *i* is calculated as follows:

$$\left(\frac{I_L^i - I_{t-12}^i}{I_{t-12}^a}\right) \times w_{t-12}^i \times 100 + \left(\frac{I_t^i - 100}{I_{t-12}^a}\right) \times I_L^a \times w_t^i$$

where:

$I_L^i$-index for component *i* in the weights change period;

$I_{t-12}^i$–index for component *i* in period *t-12*;

$I_{t-12}^a$ - all-items CPI in period *t-12*;

$w_{t-12}^i$ –the weight of component *i* in the consumer basket of period *t-12*;

$I_t^i$– index for component *i* in period *t*;

$I_L^a$– all-items CPI in the weights change period;

$w_t^i$– the weight of component *i* in the consumer basket of period *t*.

*Example: calculation of group contributions in the case of weight change*

Using the above formula, the contribution of food and non-alcoholic beverages to the overall CPI for October 2012, given that the weights for this group in 2011 and 2012 are 0.35 and 0.28, respectively, can be calculated as follows (see table 6):

*Table 6*

| Indices compared to December of previous year | | | | |
|---|---|---|---|---|
| | December 2010 | October 2011 | December 2011 | October 2012 |
| Food and non-alcoholic beverages | 100.0 | 101.2 | 101.7 | 102.2 |
| All-items index | 100.0 | 101.6 | 103.2 | 101.8 |

$$Contribution = \frac{(101.7-101.2)}{101.6} \times 0.35 \times 100 + \frac{(102.2-100)}{101.6} \times 0.28 \times 103.2 \approx 0.8\%$$

Thus, the contribution of food and non-alcoholic beverages in the all-items CPI in October 2012 amounted to 0.8 percentage points.

### 9.2 Time series data for CPI

Different kinds of CPI time series data is published along with the press release on the web-site each month:

1. CPI to the previous month;
2. CPI to the long term base period;
3. CPI to the same month of previous year;
4. CPI 12 month average to the previuos 12 month average.

Several kinds of HICP data is also published monthly:

1. Harmonized Indices of Consumer Prices compared to the previous month.
2. Harmonized Indices of Consumer Prices compared to the corresponding month of the previous year.

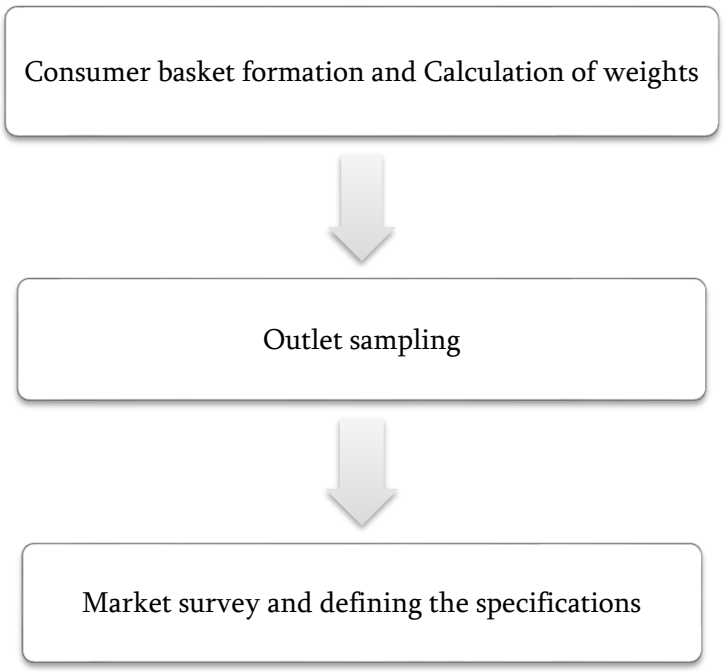
The published indices, rounded to four decimals, are final numbers. Time series data is published along with corresponding graphs on the web-site.

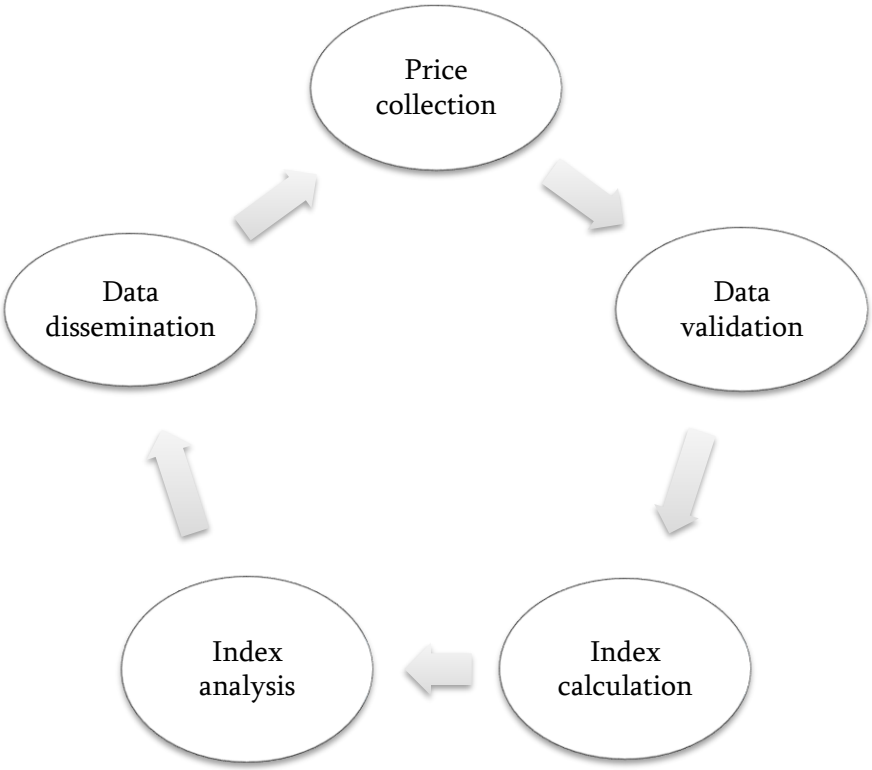
The data is also available by using PC-Axis - data dissemination software created by Statistics Sweden. It is a complex system of data dissemination that gives an opportunity to a user to obtain different types of information in different formats (text, tables, graphs, etc.) from the Geostat's web-site (www.geostat.ge).

The CPI data is also disseminated through android application.
Diagram# 2 represents stages of CPI calculation and its periodicity.

Diagram #2: stages of CPI calculation

**Annual activities:**




**Monthly activities:**