

The system of price indices in the Republic of Belarus

The system of price indices in the Republic of Belarus includes compilation of price indices for all sectors of the economy. Implementation of the international standards had been achieved step by step. At the first stage the changes concerned consumer price and producer price indices (CPI and PPI).

Organization of the state price and tariff information collection on consumer goods and on services rendered to population

A methodology of monthly compilation of CPI was developed in 1994 with help of experts from IMF.

Since that time the methodology has been improved, however the milestone principles and approaches in the production process of CPI are preserved.

In the Republic CPI is accepted as an inflation indicator. It is used for adjustment (indexation) of consumers' income: wages, pensions, allowances that guarantees maintenance of the living standards; for recalculation of the economic indicators into comparable prices; for providing information on price changes in the economy to the government, business area, labour unions and population.

Consumer's basket that creates a basis for CPI compilation is a representative sample of goods and services which are in the most frequent use by the population. The weights are based on the expenditure shares of purchasing different goods and services in the total consumption expenditure for the previous year.

Structure of the consumption expenditure in the Republic of Belarus is identified using data on the households' expenditure for goods and services purchasing available from the Household Survey results.

In the Republic every year there are about 6 thousands surveyed households. The households are selected by probability sampling in the way that the sampling units are chosen at each stage using probability proportional to population size. This principle guarantees independence of the sampling results and allows avoiding non-random errors.

Taking into account that the differences in structure of expenditure between the regions in the Republic are not significant, a common basket is used for CPI compilation.

Following the recommendations of IMF the structure of the consumption expenditure used for CPI production is revised every year.

For compilation of CPI total index the following two sets of statistical data are used:

- indices of average prices (relative price indicators) for consumer goods and services;
- real structure of the previous year consumption expenditure of population, that is estimated using fixed list (basket) of goods and services.

The basket of goods and services that is involved in the CPI production in 2010 includes 421 items of good and services, where 148 – food commodities, 210 – non-food commodities, 63 – services. The list was created on the basis of Classification of Individual Consumption According to Purpose (COICOP).

The source information for CPI production is the data on price registration of representative goods (services). Regular price and tariff registration for consumer goods and services carried out by statistical bodies in 31 cities, where more than 50 per cent of the population of Belarus or 77 per cent of the total urban population are settled. Since January 2010 the Republic of Belarus moved over to the consumption structure of whole population, not only urban.

Collection of information on prices is undertaken for each item of the basket at all selling outlets and markets, where the selected for observation goods and services are distributed on a regular basis. The data on real places of purchasing by customers of goods and services are taken as well from the Household Survey results. It is established that in Minsk the observers should register not less than 10 prices suitable for production of CPI for every of goods (services), in the regional centres – not less than 5 and in the districts – not less than 3.

Collection of the data on prices is carried out in the period from 10th to 30th days of every month. CPI includes all main groups of goods and services, covering every month more than 47000 price quotations. Sample for CPI composes of 5154 trade units: 1064 units for food commodities, 2054 – for non-food and 2036– for services.

Computation of CPI total is done by Laspeyres method where the relative indicator of price changes in the relation to the previous period is used. For the production of aggregated indices of individual goods, groups of goods and services the price indices received from the regional offices are weighted by the territorial weights (relative weight of population of the corresponding region in the total population of the Republic adjusted by the graded average individual consumption estimated per 100 households in this territory).

Methodological regulations on compilation of base consumer price index

Besides the total CPI produced, since 2004 in the Republic there is a base consumer price index the structure of which differs from the total CPI by excluding goods that are under government price regulation and that are seasonal goods.

For the base CPI and total CPI production the same source data are used. In 2010 the list of consumer goods and services for the base CPI includes 354 items: 114 food goods, 202 non-food and 38 services.

Once the list of goods and services that are under government price regulation is changed, the structure for compilation of the base CPI is adjusted.

Organization of the state information collection on producer prices

The producer price index reflects the dynamics of prices in producer sales (wholesale) without taking into account VAT, excise tax and other duties on gains. The PPI is produced at both regional level and for the total economy, by sectors and sub-sectors, as well as for non-consumer and consumer goods separately. Besides, the indices are compiled for some individual goods.

The time series of PPI by economic activities have been already built since 2000. Since 2011 all estimations in the Republic will be done by economic activities (not by branches).

Precision of PPI depends on representativeness of the sample that is involved into the statistical price registration. About 60-70 per cent of value of the produced output in every economic sector and sub-sector are selected to achieve the representativeness.

During selection process of individual goods as sample commodities there is a need paying attention to the goods that have higher relative weight in the total output of this commodity group. Value share of the total sample should be not less than 70 per cent of value of the total output of enterprise. In 2010 the observation composes of 4500 items of individual commodities.

Observation of trends and dynamics of producer prices is carried out by the statistical office within the selected network of enterprises that includes 1467 industrial units in 2010.

Source information for production of PPI is the data on statistical price registration for commodities or for the small homogeneous goods sub-groups.

Computation of PPI total is done by Laspeyres method.

A simple annual average price (sum of prices for all months divided by 12) is accepted as the basis price for computation of observed commodities' price indices.

Change of base period and revision of weights are carried out on the regular basis by the National Statistical Committee of the Republic of Belarus.

Individual price index for a commodity is estimated as a ratio of the price in reporting month to the average annual basis price.

Total PPI is produced by the following formula:

$$I_p^k = \frac{\sum i_j \times P_{jo} Q_{jo}}{\sum P_{jo} Q_{jo}},$$

Where: I_p^k – total producer price index for the reporting period (t) in comparison to the average annual price of the base period;

i_j – individual price index for the commodity j for the reporting period (t) in comparison to the average annual price of the base period;

$P_{jo} Q_{jo}$ – total cost of commodity j in the base period;

$\sum P_{jo} Q_{jo}$ – total cost of all (k) commodities in the base period.

The data on costs of goods and groups of goods in the base period are used as the weights.

Organization of state statistical monitoring of tariffs for the cargo transportation

The composite index of tariffs for the transportation of goods reflects the dynamics of tariffs for the transportation of goods by all modes of transport. Calculated for the transport in general, for the mode of transport and communications, it is used to measure the performance of the transportation organizations to determine the deflator index, which is used to perform a variety of economic calculations and forecasting at the macro level.

The objects for the sample state statistical monitoring of tariffs for the transportation are:

- tariffs for the carriage of goods by rail public transport, in general and by the specific types of transport and goods;
- tariffs for the carriage of goods by road transport, in general and by the type of transport;
- tariffs for the transportation of goods by inland waterways for public use, in general and by the type of transport;
- tariffs for the carriage of goods by civil aviation, in general and by the type of transport;
- tariffs for the transportation of the petroleum products by the trunk pipeline and the cost of transporting the gas.

The list of the basic transport organizations includes the most typical organizations for each type of transport by various forms of ownership.

Based on the previous information, the individual index of tariffs for the transportation of goods is calculated as the ratio of tariffs for the reporting month to the rate of tariffs for the previous month. Individual indices of tariffs for the cargo transportation characterize changes in the level of tariffs for the cargo transportation for every type of transport of a specific type of transport.

The following statistical data are used to calculate the composite index of tariffs for cargo transportation:

- individual indices of tariffs for the representative-services;
- income derived from the transportation of goods for the base year for representative services for specific types of transportation and types transport.

To calculate the consolidated monthly indices of tariffs for the transportation of goods by type of transport used a modified Laspeyres formula.

Guidelines for the calculation of the index of parity prices for the industrial goods, works and services consumed by the agricultural organizations, and for the sold agricultural products

Index of parity prices for the industrial products, works and services consumed by the agricultural organizations, and for the sold agricultural products reflects the ratio between the dynamics of prices for goods and services used in the agricultural production, and prices for the sold agricultural products.

The basic information for determining the index of parity prices for industrial and agricultural products are the data on producer price indices of industrial products and price indices for the sold agricultural products.

The index of parity prices for the industrial and agricultural products is used for the analysis of terms of trade and price adjustment policies in the agriculture.

The price index for the sold agricultural products reflects the dynamics of average prices for the agricultural products across all marketing channels.

The average prices for the agricultural products include premium (discount) on prices, given the quality of sold agricultural products and doesn't include subsidies allocated from the budget due to the state regulation of prices, the costs associated with the transportation, loading and unloading of products, and the value-added tax.

The individual price index reflects changes in the prices of the certain types of agricultural products in the reporting period, compared with its level in the base period.

The change of prices of the agricultural products (crops and livestock) and agriculture as a whole during the review period and compared to the reference period is calculated based on the volume of sales of the agricultural products of the reporting period and the reporting and sales prices for the base period, using the Paasche formula.

The calculation of the price index for the industrial goods, works and services consumed by the agricultural organizations, is based on the producer price indices of industrial products. The price index for industrial products, works and services consumed by the agricultural organizations, is calculated as the aggregate index:

$$I_p = \sum i_j \times d_j,$$

where I_p – the combined price index for the industrial goods, works and services consumed by the agricultural organizations;

i_j – the corresponding producer price index of industrial production of j goods, works and services consumed by the agricultural organizations during the reporting period (t) compared with the corresponding period of the previous year;

d_j - the share of the j item, the cost items in the total expenditure of the primary agricultural production.

As weights for the price indices by type of goods, works and services consumed by the agricultural organizations, specific weights of items, articles of costs in total expenditure of the primary agricultural production are used.

The weights of the elements, the cost of the basic articles of the agricultural production are calculated from the data on the amount of industrial goods, works and services consumed by

the agricultural organizations, on average for the previous three years, which are determined by dividing the value of each element, cost of articles and the total cost of the basic agricultural products.

Index of parity prices for the industrial products, works and services consumed by the agricultural organizations and sold agricultural products, calculated by dividing the composite price index for the industrial goods, works and services consumed by the agricultural organizations by the combined price index for the agricultural products.

Price indices for the construction and installation works

The calculation of price indices for the construction and installation works, according to the decision of the Government of the Republic of Belarus is the responsibility of the Ministry of Architecture and Construction of the Republic of Belarus. The method for calculation of the price indices for building and construction is approved by the joint decision of the Ministry of the Architecture and Construction of the Republic of Belarus and the Ministry of Statistics and Analysis of the Republic of Belarus.

The information basis for the calculation of the price indices for the construction and installation works are the collection of data on the cost of materials, products and designs in the factories - manufacturers, on the imported materials - in the departments of industrial, technical configuration, tariffs on automobile transportation - in the offices of mechanization and automotive organizations. Tracking of prices is carried out for the 104 aggregated groups of materials.

The calculation of the price index for the construction and installation works is carried out by taking into account the proportion of the constituent elements of cost in the total cost of construction and installation works. The basic structure of the cost of construction and installation works is based on the 1991 prices.

The price indices for the construction and installation works are reported monthly to the National Statistical Committee of the Republic of Belarus (Belstat). Belstat maintains dynamic series of indices and performs calculations of indices for the different periods.

Price indices of foreign trade

The indices of average prices of export / import of goods is characterized by changes in the level of prices for exported / imported goods in the reporting period compared with the baseline.

To calculate the index of average prices is used the annual average export / import of similar goods (at the level of ten-codes of the Nomenclature for Foreign Economic Affairs of the Republic of Belarus) for the previous year, and similar data for the current month for which data is available about the quantity and value. It can be used to calculate the value figures in Belarusian rubles and in the US dollars.

The sampling of items for the calculation of indices of the average prices is done from the aggregated database of foreign trade statistics. For each commodity group, it should constitute be at least 70% of the total value of goods in the group. Base structures are changing every year. Calculation of the indexes is done separately for Russia, and other Commonwealth countries and countries outside the CIS.

The ratio of the average price of goods for the current month to the average price of this commodity in the base year price index is calculated individually for each specific product. To ensure the necessary level of the accuracy, exclusion of the incomparable data and possible errors in the index should be included in the interval [0,5: 2,0].

The calculation of the composite index of average Laspeyres prices or each commodity group is made by summing up the individual indices of prices of goods on their share in total exports / imports of the commodity group for the base year.

To calculate the index of average Paasche prices is used the following formula:

$$I_p^P = \frac{\sum \bar{P}_i * Q_i}{\sum (\frac{\bar{P}_i * Q_i}{\bar{P}_i \div \bar{P}_{i_0}})},$$

where I_p^P – is a composite index of the average Paasche prices for the current month compared with the average value of the base year;

\bar{P}_i – the average unit price of goods exported/imported in the current month;

\bar{P}_{i_0} – the average unit price of goods exported/imported in the base year;

Q_i – the quantity of goods exported/imported in the current month.

The value of goods in the base year prices is calculated for each specific product by dividing its value in the current month by an individual index of average prices. The index of average prices for each commodity group is determined by the relation of the value of all goods in a group in the current month to the sum of their values in the prices of the base year. Similarly, the composite index of the average prices is calculated on the basis of the group indices.

As an official result the average Fisher prices are used – the geometric mean value of the two above mentioned indices (Laspeyres and Paasche).