8. PRICES

All of the price indices listed in this chapter are calculated as **sample indices,** i.e. their calculation is based on prices of **selected** representatives (of both goods and services) obtained in a sample of reporting units. The individual price indices of the representatives are grouped to make aggregate indices for groups and an aggregate index for the whole set of the representatives. This is done by means of a weighted arithmetic mean of individual indices where structural indicators of value (production, sales, turnover, purchases, expenditures of households, etc.) of individual representatives or a group of representatives are used as constant weights. These structural indicators are determined from figures related to a base ("zero") period (e.g. to years 1984, 1989, 1993, 1999).

The above aggregation into the aggregate index can be described by this modified Laspeyres formula:

$$I = \frac{\sum_{i} \frac{p_{1i}}{p_{0i}} * w_{si}}{\sum_{i} w_{si}} * 100$$

where

$p_{1i} =$ the price of the i-th representative in the reference period,

$p_{0i} =$ the price of the i-th representative in the basic period,

$W_{si} =$ the constant weight (structural indicator of value, usually in per milles) of the i-th representative/group of representatives.

Price indices (monthly and quarterly) are calculated from prices measured in the reference period (around the middle of a month for monthly indices and in the 2nd month of a quarter for quarterly indices). Annual indices are calculated as an arithmetic mean (weighted average for agricultural producer prices) of the indices from individual months/quarters of the year, related to a selected price base, which is considered to be a constant base for a certain period of time.

Producer price indices - outputs and consumer price indices, which had been calculated on the structure of 1989 (or 1990) and on the price base 1 January 1989 (or January 1989, the year 1989, 1 January 1990) by the end of 1994, received a comprehensive revision in 1994. Indices published between 1995 and 2000 are based on the 1993 structure. In 2000, there was another comprehensive revision made. Since 2001, price indices based on the 1999 structure have been published.

The individual producer price indices use the national CZ-CPA linked to the national CZ-NACE, while consumer price indices are derived on the basis of the international Classification of Individual Consumption by Purpose (CZ-COICOP). (See the list of valid statistical classifications provided in the introduction to the yearbook.) At the same time, the base period of price indices was changed to December 1999 (the fourth quarter of 1999 or the year 1999) and new weight structures were put in use: 1999 sales for producer prices and 1999 household expenditures for consumer prices. Another price base was also put in place, namely the average of 2000. Indices related to the 2000 average are derived from basic indices related to December 1999 (or the fourth quarter of 1999 and the year 1999, etc.).

The price indices measure price trends in dependence on time. The employed Laspeyres formula with constant weights measures "net price changes", i.e. changes not influenced by changes in structure, assortment, or quantity.

The price indices are also employed to convert value indicators from current into constant prices (deflating). For this purpose more detailed indices are used, possibly for the lowermost groups of value indicators of goods and services at current prices. In deflating, these more detailed price indices are re-weighted according to the structure of current period. This gives rise to an aggregate implicit price deflator which differs from an aggregate price index. The price indices of the Laspeyres type are weighted in principle by constant weights based on the structure of the basic period.

Notes on tables

*Table **8**-1. **Producer and consumer price indices***

Agricultural producer price index

The price index of agricultural producers has been derived monthly from nominal prices of selected products since 1991. Between 1992 and 2000, prices of 129 price representatives were measured (79 crop products, including fruit and vegetables, and 50 animal products) among agricultural producers.

Since 2001, prices of agricultural products have been measured on 95 basic agricultural products (price representatives): 63 crop products (including fruit and vegetables) and 32 animal products. The measurement taken in about 650 selected agricultural producers includes prices of selected products classified to Divisions 01 and 05 of the CZ-CPA, designed for the domestic market only. The prices are adjusted for VAT and related to quality and/or other parameters either included in the name of product or the methodological instruction "Description of Representatives for Questionnaire Ceny Zem 1-12". The exception is the prices of fruit and vegetables where only top quality is measured.

Average prices of measured products are calculated as simple arithmetic mean of prices of individual producers.

A constant weight scheme is laid down to calculate individual, group and aggregate price indices. It is derived from the structure of sales and amounts of agricultural products in the months of 1999. Average annual indices use a separate constant weight scheme, compiled on the basis of data on sales of products and amounts (and their aggregates) for 1999 as a whole. The base price period of the indices is the average of 1999.

Agriculture input price index

Between 1996 and 2001 the calculation of the agriculture input price index (AIPI) was based on the weight scheme derived from 1993 sales results. The price base was the year 1994.

The calculation of the new revised AIPI in 2002 used a new weight scheme based on the year 2000, and the price base was the year 2000.

The new introduced system of the AIPI calculation complies with Eurostat methodology. The AIPI is composed of two price sub-indices, namely **Goods and services consumed in agriculture** and **Goods and services contributing to agricultural investments.**

The AIPI is based on purchases of agricultural means of production. The sub-indices are calculated quarterly, from output-type indices of other industries and the calculation is supplemented with the processing of the quarterly results of statistical questionnaires. The aim is to establish the level of prices involved in the sale of selected goods and services to enterprises engaged in primary agricultural production, i.e. the prices for which the enterprise purchases selected goods and services from the supplier. The data are measured on a sample of reporting units supplying (selling) specified kinds of goods and services.

Forestry (raw timber) price index

The index has been calculated every month since 1991 from prices measured monthly by means of national statistical questionnaire. Before 1995, prices of 11 coniferous and 9 non-coniferous products - price representatives - were measured. However, the price index did not describe any net price movement, because the nature of the definition of the representatives permitted, to some extent, the inclusion of extra-price structural influences (changes in the structure of sold timber) in addition to changes in nominal prices.

Since 1 January 1995, forestry prices have been collected for 35 price representatives, i.e. for 35 basic assortments of non-coniferous and coniferous raw timber products (classified to CZ-CPA

Division 02), from approximately 60 reporting units. The prices are contractual prices of deliveries to the domestic market only and do not include in-house consumption.

Average prices of products under survey are calculated as simple arithmetic mean of prices of individual timber producers. Weight proportions are calculated for both products and their aggregates from figures on 1999 sales. The price base of the index is December 1999.

In 2005, the methodology of measuring raw timber prices was changed to comply with the "Recommended Rules for Measurement and Grading of Timber in the Czech Republic".

Industrial producer price index

This index has been calculated monthly since 1991 (quarterly up to 1990). Prices are reported on national statistical questionnaire.

The new revised scheme of the industrial producer price index in force since 2001 included 5 736 representatives on 1 January, whose prices were measured in 1 340 reporting units. Compared to the situation before the revision, one quarter of price representatives and next to one fifth of respondents were replaced, both of them slightly growing in number (there were 5 656 price representatives and about 1 250 respondents before the revision).

The reported price is a simple arithmetic mean of prices agreed upon between the supplier and the customer, which occurred with the respondent in all significant business cases on the 10th to 12th days of the reference month. The reported price is free of VAT, consumer tax, costs of transport to the customer and costs associated with the transport.

The reported prices are then used to calculate the industrial producer price index based on constant weights. The index measures the average price development of all manufactured products made and sold in the domestic, Czech market. The manufactured products are products made by industries classified as sections C to E of the CZ-NACE.

The constant weights for the industrial producer price index were determined from the 1999 structure of domestic sales of products classified to CZ-CPA divisions 10 to 41. The calculation excluded 21 classes (four-digit level) of this classification. These classes either include industrial services or are insignificant in terms of weight. Chosen for the price base was December 1999.

Price indices of construction work and types of constructions

Between 1991 and 1994, this index was calculated every quarter on the basis of prices collected on national statistical questionnaires. Prices for the price index of construction work were measured on 1 421 representatives (selected types of construction work) in about 400 chosen organizations employing 25+ persons.

In 1995, an advanced type of statistical reporting ("shuttle" reporting) was put into use to determine the construction work price index: the contents of the questionnaire are not amended for the period of at least 2 years and the questionnaire travels between the reporting unit and the State Statistical Service to and from.

In 2004, there were 142 price representatives (chosen types of construction work) in the questionnaire, for which the reporting unit gave details as to the conditions under which the prices were implemented. The reporting network established by purposive sampling embraced about 750 respondents of all size classes and different legal forms, supplemented with various assembling enterprises specialized in air conditioning, lifts and steel structures.

These quarterly reported prices, which are measured in the second month of a quarter, are prices negotiated between the supplier and the customer for a unit of construction work, carried out by own staff of the reporting unit in the Czech Republic. In addition to material for domestic construction, they include all the other costs needed to implement the activity under survey, and exclude the costs of site preparation and VAT.

The prices measured are averaged out (arithmetic mean) and to some extent they include different implementation conditions of particular construction in the reference period. The average prices are not used to calculate the price indices, though. The calculation of the price index relies on simple individual price indices of individual representatives.

Between 1995 and 2003, the CZ-CPA classification (divisions 45 and 46) was employed to classify prices and price indices of construction work and constructions. On 1 January 2004, however, the classification of types of construction (CZ-CC) was put in use; it replaced CZ-CPA division 46 and has been in use since.

The index scheme makes it possible to calculate the price indices of construction work and constructions since 1995. After the 2000 revision, the weights of the indices for periods from 2001 onwards were determined on the results of the construction output survey 1999 and an ad-hoc survey of budget items of construction work prices, with the aim to correspond to the current structure of construction production in the Czech Republic. The fourth quarter of 1999 (or December) was chosen for the base period of the constant representatives. Since 2004, indices of construction output costs and indices of material inputs of constructions have been monitored; they are back-cast down to 2001.

As the input values for the price indices of material inputs are used chosen indices of materials, products and semi-finished products consumed in construction, which are derived from the industrial producer prices survey.

The indices of construction output costs include material inputs price indices, earnings of workers in individual construction occupations, rates of health and social insurance paid by the employer, indices of national transport and overhead costs index.

The quarterly survey and calculation of the price index of construction work and types of constructions are supplemented by monthly estimates of trends in construction work prices. The estimates are regularly updated with retrospective effect (on the 45th day after the end of the quarter concerned), according to results of the quarterly price survey. December 1999 was chosen to be the price base for estimating trends in construction work.

Tangible fixed assets price index

The index is calculated from prices of machinery, devices, facilities, inventories and transport equipment of domestic provenance and imported for investments, and from prices of construction work. These partial indices are pooled to make an aggregate tangible fixed assets price index by weighting shares of machinery, devices, facilities, inventories and transport equipment, and construction work for investments in the total volume of implemented investments in the national economy.

Between 1995 and 2000, the tangible fixed assets price index was based on the 1993 structure, taking account of a more current structure of imports. In 1995, the product groups incorporated into the tangible fixed assets price index were revised, and a sample import price index has been used in place of the unit value index since.

Since 2001, the tangible fixed assets price index has been based on weightings of 1999 derived from definitive data. The base price period is the average of 2000.

Price index of market services

The aggregate price index of market services has been calculated in relation to other price indices since December 1993. It includes the following price indices of market services in the business sphere (i.e. services provided between enterprises): price indices of national freight transport, postal and telecommunication services, financial intermediation, insurance, price index of real estate, renting and business services, and sewage collection charges (the water supply rate index, which is measured on a common questionnaire, is incorporated into the industrial producer price index - see the classification CZ-CPA).

Price surveys concerning these market services, which are grouped to make the aggregate price index, include selected services listed in following CZ-CPA and CZ-NACE divisions: 60, 61, 62, 64, 65, 66, 70, 71, 72, 74, and 90.

Methodology for the survey of individual services areas is described with the price indices of services published separately.

The constant weight of the aggregate index is the sum total of the weights for individual services areas in 1999.

National freight transport price index

The price index of total national freight transport (including road transport) has been calculated since 1 January 1995 on data measured in and reported by selected reporting units monthly. Measured are prices relating to constant representatives (20 price representatives in České dráhy, a.s. and 15 price representatives in each of other 51 chosen respondents) and to constant transport distances. The data are contractual prices for the domestic market, obtained on constant representatives and constant transport distances. Prices of pipeline, river and air transport are measured in significant transport contractors having a dominant position in given areas, and the survey covers the entire structure of their transport activities. They are contractual prices designed for the internal market. The aggregate national freight transport price index includes indices for transport by rail, road, pipeline (crude oil and natural gas), river and air; the individual indices are calculated independently and subsequently grouped to make the aggregate national freight transport price index.

Average prices of transport services (falling under CZ-CPA divisions 60-62) are calculated as a simple arithmetic mean of prices identified with different carriers.

A constant weight pattern determined on the 1999 sales structure is established to calculate individual and group price indices, as well as the aggregate one. The price base is December 1999.

Communication services price index

Communication services include postal activities, telecommunications and radio communications.

The price index of communication services has been calculated monthly since 1993 from prices measured in 5 chosen reporting units. Responding to the revision of price indices, the index of communication services was expanded on 1 January 1995 to include mobile telephone services, too. Prices used to calculate this index, which include both contractual prices (excluding in-house consumption prices) and centrally regulated prices, are measured on 44 selected representatives (CZ-CPA division 64) and exclude VAT. They are prices of services (outputs) designed for the domestic market.

Average prices of the outputs of postal services and telecommunications are calculated as simple arithmetic mean from prices obtained from individual respondents.

The weight scheme was established on 1999 annual revenues of communications. The base price period of the index is December 1999.

Price index of financial intermediation, except insurance and pension funding

This index has been calculated monthly since December 1993 using data collected from four selected reporting units engaged in financial intermediation, from the banking sector. At the same time, prices of so-called other financial intermediation (financial lease) have been measured in four chosen largest leasing companies.

Since 1999, the measurement of financial intermediation prices has been focused only on prices of selected banking services (provided by commercial banks to enterprises). Prices of financial leasing services are measured on four chosen representatives of leasing provided to enterprises. Lease coefficients calculated from prices net of VAT are considered to be financial leasing prices.

Yields from financial activities of commercial banks and from financial leasing are constant weights of the index. The price base of the index is December 1999.

Insurance price index

The insurance price index has been calculated monthly since 1995 on data obtained for a sample of reporting units (five largest insurance companies operating in the internal market). The survey carried out by means of national statistical questionnaire is directed to insurance of enterprises only.

The price index includes 15 selected representatives - property insurance for the area of the so-called small and medium risks (against fire and theft), insurance of motor vehicles (passenger cars and utility vehicles) and insurance of agricultural production (crops and animals).

Considered as the price of insurance is always the premium for a given representative, which is calculated from the rates of insurance companies (in per cent or per mille) and from the premium for the property under insurance. Hence, price movement outside the domain of insurance considerably influences the growth of insurance prices, which is measured by a price model.

Premium average prices are calculated as simple arithmetic mean from prices collected from chosen insurance companies.

A constant weight scheme derived from 1999 premiums is employed to calculate individual and group price indices, as well as the aggregate index. The price base is December 1999.

Price index of real estate, renting and business services

The price index of real estate, renting and business services (hereinafter referred to as "business services" only) has been calculated since 1994. Before 2003, it was reported as the index of other market services. The prices of selected services are measured monthly (national statistical questionnaire) in approximately 450 selected reporting units rendering market services in the country, mostly for businesspersons.

The survey covers prices of services classified to the following CZ-CPA divisions: 70 - Real estate services, 71 - Renting services of machinery and equipment without operator and of personal and household goods, 72 - Computer and related services, and 74 - Other business services (namely legal, accounting, book-keeping and auditing services; tax consultancy; architectural, engineering and related technical consultancy services; advertising services; investigation and security services, industrial cleaning services; translation services; exhibition, fair and congress organisation services). Prices for the price index of business services are measured on approximately 100 representatives.

Average prices of the services (representatives) measured are calculated as simple arithmetic mean from prices collected from chosen service providers.

A constant weight scheme based on the structure of sales of services rendered in 1999 is employed to calculate individual and group price indices of business services, as well as the aggregate index. The price base is December 1999.

Drinking water rate and sewage collection charges indices

These indices have been calculated monthly since 1992. The charges are measured by means of national statistical questionnaire in chosen reporting units (about 45 water management organizations). They are contractual charges collected for four water management products-representatives (drinking water invoiced to households, drinking water invoiced to other customers, sewerage collection invoiced to households, and sewerage collection invoiced to other customers). The national classification CZ-CPA (divisions 41 - Collected and purified water; distribution services of water, 90 - Sewage and refuse disposal services, sanitation and similar services) was employed for the calculation of the price index. The charges obtained from the survey are VAT-free contractual charges designed for the internal market only and exclude in-house consumption.

Average charges relating to the monitored commodities are calculated as simple arithmetic mean from charges obtained from chosen organisations engaged in the water and sewage business. To calculate individual and group indices, including the aggregate one, a constant weight scheme is established on the 1999 structure of revenues from water rate and sewage collection charges. The price base is December 1999.

The drinking water rate index is part of the index of industrial producer prices, which is why it is not given separately.

Import and export price index

This index has been compiled for the CR since 1993. The weighting scheme now includes about 1 460 representatives for exports and 1 300 representatives for imports which significantly

participate in the volume of the implementation of individual significant groups of external trade. Average prices of 1999 are used for the base price period.

The prices were measured quarterly before 1998. Since 1998 they have been measured monthly on questionnaires completed by approximately 460 and 420 reporting units engaged in exports and imports, respectively. The import prices measured are prices invoiced by the foreign supplier, the export ones are prices FOB (free to the Czech border). Where a price representative is traded in several countries, the reporting units give average prices in terms of the weighted arithmetic mean of prices obtained in significant commercial transactions (weighted by the quantity of products in physical units). The prices are converted into CZK by means of the Czech National Bank's relevant exchange rate and are measured free of customs duty, VAT and consumer tax.

CZSO world price index of raw materials and food

The index has been calculated by the CZSO since 1991. The calculation is based on information from stock exchange records on average prices of selected commodities in currencies world stock exchanges use to quote commodities.

The index was revised and the new one based on a different index structure - the structure of chosen commodities imported to the CR in 1999 - has been published since 2001. World prices of metals, ores, crude oil, natural gas, textile raw materials, skins and hides, rubber, food, oils, and timber are taken from daily stock-exchange records presented by the Czech Press Agency on the Internet, from daily news in the Handelsblatt *and in the* Hospodářské noviny*, and from company* Transgas a.s. *Price averages of 36 selected items (commodities with a high share in imports to the Czech Republic) constitute a basis for the calculation of simple commodity price indices and aggregate indices of seven final commodity groups. The base price period is December 1999.*

Consumer price index

The consumer sphere includes indices of consumer prices of goods and services. Trends in consumer prices are measured on consumer baskets based on a set of selected kinds of goods and services paid for by the population. Goods and services which have a significant share in the expenditure of households are chosen to be price representatives. More details on the consumer baskets are available in the CZSO publication "Indexy spotřebitelských cen (životních nákladů), Revize 2000" *(Consumer Price (Cost-of-living) Indices, Rev. 2000), publication code 0208-01, brought out in 2001.*

The current consumer basket includes about 790 particular goods and services (representatives), which are split into 12 divisions according to the national classification CZ-COICOP based on the international Classification of Individual Consumption by Purpose. The base period weights for the calculation of group and aggregate indices are derived from the structure of household expenditure derived from 1999 household budget statistics.

December 1999 average prices are taken for the price base.

Trends in consumer price indices show how the overall price level develops: They also show the developments of the components chosen for the consumer basket and of the price level of expenditures (costs of living) for selected socio-economic groups of households.

Consumer prices are measured once a month in the reporting network of selected stores and other outlets (about 13 500) in 41 (40 from October 2002) districts of the Czech Republic and the capital city of Prague. The survey is taken by the CZSO regional offices.

Average prices of the price representatives are calculated as weighted arithmetic mean of average prices for regions using mid-1999 population weights. Average prices of the representatives for regions are calculated as simple arithmetic mean of prices obtained in a region concerned.

Table 8-2. Harmonized index of consumer prices (HICP)

Harmonized indices of consumer prices (HIPCs) came into being in the EU in response to the need to establish comparable indices of consumer prices, so that inflation trends in the EU member states to be used as a criterion for the accession to the European Monetary Union could be measured.

There are certain differences between the structure of the consumer basket for the national index of consumer prices of the CR and the structure of the consumer basket for the HICP. The HICP weights include receipts from purchases made in the CR by foreigners and does not include hypothetical rent, whereas the national index of consumer prices includes hypothetical rent and does not include receipts from purchases by foreigners.

The HICP uses chain weights which are altered in December every year. National accounts data (final monetary consumption of households, domestic approach) for the period of two years preceding December concerned are a source for the updating. (For instance, data for the year 2002 are used for the updating carried out in December 2004, and these are time-extrapolated to December 2004, using the price indices.) Average of the year 1996 is used for the base period.

Table 8-3. Industrial producer price indices: by selected CZ-CPA division, group and class

The table presents selected groups as defined by three-digit codes of CZ-CPA. In some cases, divisions defined by CZ-CPA two-digit code are shown.

Table 8-6. Prices of selected agricultural products

The current system of statistical surveying has been in use since 1991. The prices are measured in the network of selected agricultural producers. They are mostly nominal prices of selected agricultural products related to main (specified) quality grades. Prices of vegetables and fruit refer to top quality only. The reported price is a simple arithmetic mean of prices of individual significant contracts which were executed around the middle of the reference month.

Table 8-7. Raw timber prices: selected assortments

Average prices of selected raw timber products (assortments) derived from figures reported in monthly price surveys. The prices are derived as a simple arithmetic mean of prices of individual significant business cases implemented around the middle of the reference month. See the explanatory notes to Table 8-1, too.

Table 8-8. Consumer prices: selected goods and services

Consumer prices of selected price representatives are nation-wide average consumer prices related to December of a given year, which are, in nature, average values of individual varieties of respective representative. Their arrangement in the table is based on the revised consumer basket structure in force as from 2001.

Table 8-9. Consumer price indices: goods and services

The group indices of consumer prices are arranged to comply with the structure of the 2001 consumer basket.

Table 8-10. Consumer price indices: goods and services, by selected social group of households, 2005

The consumer price indices given refer to twelve CZ-COICOP divisions. In addition to totals, they are broken down into two social groups (households of employees and households of pensioners).

Table 8-11. Price indices of selected kinds of real estate

The source of the data is the real estate transfer tax returns administered by revenue authorities. The price index is the ratio of two average unit-purchasing prices for two different time periods. The dependence of the selling price on wear is very distinct. The table shows the kinds of real estates offered by the source database, for which sufficient price information is available.

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Figures for 2002 to 2005 are not fully comparable with those published in the previous Statistical Yearbooks. The changes are also described in individual notes on the tables.

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Producer price indices, consumer price indices and external trade price indices are available in the CZSO publications brought out according to the CZSO Catalogue of Publications 2006, thematic group 7 - PRICES:

subgroup 70 – Producer Prices:

– „Indexy cen stavebních prací, stavebních děl a nákladů stavební výroby" – *quarterly, 45th calendar day*

– „Indexy cen dodávek, výrobků a služeb do zemědělství" – *quarterly, 45th calendar day*

– "Producer Price Indices - Basic Information" (Czech-English) – *monthly, 11th working day*

– "Industrial Producer Price Indices" (Czech-English) – *monthly, 25th calendar day*

– „Indexy cen zemědělských výrobců" – *monthly, 25th calendar day*

– „Indexy cen zemědělských výrobců, průmyslových výrobců a indexy spotřebitelských cen potravinářského zboží" – *monthly, 30th calendar day*

– „Indexy cen v lesnictví (surové dříví) – *monthly, 15th calendar day*

– „Indexy cen tržních služeb v produkční sféře" – *monthly, 25th calendar day*

– „Ceny sledovaných druhů nemovistostí" – *December 2006*

subgroup 71 – Consumer Prices:

– "Consumer Price Indices - Basic Information" (Czech-English) – *monthly, 6th working day*

– „Indexy spotřebitelských cen - podrobné členění" – *monthly, 25th calendar day*

subgroup 72 – External Trade Prices:

– "Import and Export Price Indices in the Czech Republic" (Czech-English) – *monthly, 55th calendar day*

– „Indexy světových cen průmyslových surovin a potravin ČSÚ" – *monthly, 25th calendar day.*

Further data are published on the following web pages of the Czech Statistical Office:

– www.czso.cz/eng/edicniplan.nsf/aktual/ep-7?opendocument