

## METHODOLOGICAL NOTES

**Price index of market services** in the business sphere is the indicator for monitoring of price movements and measurement of inflationary pressures on the market of services. Price index of market services is used on national and international level (Service Producer Price Index – SPPI) and it is regularly sent to the public database of the European Statistical Office (Eurostat). It is also part of outputs of Short-Term Statistics (STI).

The objective of the index is measure average monthly change of prices of the selected market services **designed predominantly for the business sphere on the domestic market**. Surveyed prices are realization contract prices, eventually prices from price lists, which are adjusted from the value added tax. Price indices have been published in time series since 1994.

The aggregate price index of market services is composed of the sub-price indices of the selected services which are classified into sections and divisions according to the **Classification of product by activity CZ-CPA**:

H	49	Land transport services and transport services via pipelines
	50	Water transport services
	52	Warehousing and support services for transportation
	53	Postal and courier services
J	58	Publishing services
	61	Telecommunication services
	62	Computer programming, consultancy and related services
	63	Information services
K	64	Financial services except insurance and pension funding
	65	Insurance, reinsurance and pension funding except compulsory social security
L	68	Real estate services
M	69	Law and accounting services
	70	Services of head offices; management consulting services
	71	Architectural and engineering services, technical testing and analysis
	73	Advertising and market research services
	74	Other professional, scientific and technical services
N	77	Rental and leasing services
	78	Employment services
	80	Security and investigation services
	81	Services to buildings and landscape
	82	Office administrative, office support and other business support services

More detailed levels of classification in the Classification of product by activity CZ-CPA (groups, classes, categories etc.) are used to covering the above-mentioned areas of services by the appropriate price indices. For some levels are indices published.

### CALCULATION OF FIXED BASE INDEX

The price indices are calculated from prices of the samples of representatives into aggregation using the Laspeyres formula in a modified form. The calculation uses constant weights of the basic period (i.e. structure of annual sales).

$$I_{1/0} = \frac{\sum \frac{p_1}{p_0} p_0 q_0}{\sum p_0 q_0} * 100$$

$p_1$  - the price in the reference period

$p_0$  - the price in the base period

$p_0 q_0$  – the constant weight – the value indicator of the base period (sales)

Since January 2018, the fixed base indices of market services have been calculated to the index base “2015 average = 100” on new weighting scheme based on structure of sales in 2015. Time series of fixed base indices with base “2005 average = 100” were ended and replaced by time series with base “2015 average = 100”. Previous published indices haven’t been revised.

## WEIGHTING SCHEME

The constant weight of price index of market services is the annual structure of sales for **individually published group of market services**. The weighting scheme includes only those groups of services which can be covered by a price survey and appropriately represent a relevant division.

The standard comprehensive revision of the calculation of price index of market services was performed during 2017. Its objective was update the weighting scheme so that it better reflect the meaning of individual divisions of market services in the real economy. The sales, which are take over from the statistical surveys of sales, was the foundation for the calculation of new weights.

Since January 2018, price indices of market services have been calculated with weights based on structure of sales from 2015, which replaced previous structure of sales from 2011.

**Tab.: Comparison of weighting schemes of monitored divisions of market services from 2011 and 2015**

Code	Name	Weights 2011 (‰)	Weights 2015 (‰)
	<b><u>TOTAL</u></b>	1000,000	1000,000
H49	Land transport services and transport services via pipelines	151,622	160,004
H50	Water transport services	0,403	0,425
H52	Warehousing and support services for transportation	57,229	78,125
H53	Postal and courier services	26,327	25,835
J58	Publishing services	20,370	13,680
J61	Telecommunication services	92,690	82,623
J62	Computer programming, consultancy and relates services	98,325	103,070
J63	Information services	22,555	21,456
K64	Financial services except insurance and pension funding	39,884	55,984
K65	Insurance, reinsurance and pension funding except compulsory social security	58,450	62,381
L68	Real estate services	85,018	118,913
M69	Law and accounting services	55,101	28,802
M70	Services of head offices; management consulting services	-	25,548
M71	Architectural and engineering services, technical testing and analysis	114,737	74,078
M73	Advertising and market research services	81,075	58,563
M74	Other professional, scientific and technical services	5,179	0,966
N77	Rental and leasing services	31,444	27,997
N78	Employment services	18,439	26,076
N80	Security and investigation services	16,404	14,435
N81	Services to buildings and landscape	19,567	17,475
N82	Office administrative, office support and other business support services	5,182	3,564

## DERIVED INDICES

Besides the fixed base index, which has got the base period "2015 average = 100", indices related to other time period are also published.

### Calculation of price indices to the base „previous period = 100” for representative and aggregation (IP)

#### Monthly growth rate ( $IP_m$ )

$$IP_m = \frac{IR15_m}{IR15_{m-1}} * 100$$

$IR15_m$  ... monthly fixed base index of representative or higher aggregation to the base "2015 average = 100" in the reference month

$IR15_{m-1}$  ... monthly fixed base index of representative or higher aggregation to the base "2015 average = 100" in the previous month

#### Average monthly growth rate from the beginning of the year to $m^{\text{th}}$ month ( $IP_m^p$ )

$$IP_m^p = \sqrt[m]{\frac{IR15_{m,r}}{IR15_{12,(r-1)}}} * 100$$

$IR15_{m,r}$  ... monthly fixed base index of representative or higher aggregation to the base "2015 average = 100" in the reference month and year

$IR15_{12,(r-1)}$  ... monthly fixed base index of representative or higher aggregation to the base "2015 average = 100" in December of the previous year

#### Average monthly growth rate in the reference quarter ( $IP_q^p$ )

$$IP_q^p = \sqrt[3]{\frac{IR15_{m,q}}{IR15_{m,(q-1)}}} * 100$$

$IR15_{m,q}$  ... monthly fixed base index of representative or higher aggregation to the base "2015 average = 100" in the last month of the reference quarter

$IR15_{m,(q-1)}$  ... monthly fixed base index of representative or higher aggregation to the base "2015 average = 100" in the last month of the previous quarter

Calculation of price indices to the base „corresponding period of the previous year = 100” for representative and aggregation (IS)

**Monthly year-over-year index ( $IS_m$ )**

$$IS_m = \frac{IR15_{m,r}}{IR15_{m,(r-1)}} * 100$$

$IR15_{m,r}$  ... monthly fixed base index of representative or higher aggregation to the base “2015 average = 100” in the reference month and year

$IR15_{m,(r-1)}$  ... monthly fixed base index of representative or higher aggregation to the base “2015 average = 100” in the corresponding month of the previous year

**Average of monthly year-over-year indices from the beginning of the year to  $m^{\text{th}}$  month ( $IS^p_m$ )**

$$IS^p_m = \frac{IR15^p_{m,r}}{IR15^p_{m,(r-1)}} * 100 = \frac{\frac{1}{m} * \sum_{i=1}^m IR15_{i,r}}{\frac{1}{m} * \sum_{i=1}^m IR15_{i,(r-1)}} * 100$$

$IR15^p_{m,r}$  ... arithmetic average of fixed base indices from the beginning of the year to the reference month of the year

$IR15^p_{m,(r-1)}$  ... arithmetic average of fixed base indices from the beginning of the previous year to the corresponding month of the previous year

**Average of monthly year-over-year indices for the  $q^{\text{th}}$  quarter ( $IS^p_q$ )**

$$IS^p_q = \frac{IR15^p_{q,r}}{IR15^p_{q,(r-1)}} * 100$$

$IR15^p_{q,r}$  ... arithmetic average of fixed base indices for the specific quarter of the reference year

$IR15^p_{q,(r-1)}$  ... arithmetic average of fixed base indices for the specific quarter of the previous year

Calculation of the shares of moving averages for representative and aggregation (IK)

**The share of moving averages ( $IK_m$ )**

$$IK_m = \frac{\sum_{i=m-11}^m IR15_i}{\sum_{i=m-23}^{m-12} IR15_i} * 100$$

$\sum_{i=m-11}^m IR15_i$  ... sum of 12 fixed base indices (counting backwards from the reference month)

$\sum_{i=m-23}^{m-12} IR15_i$  ... sum of 12 fixed base indices (counting backwards from corresponding month of the previous year)

## ASPECTS OF STATISTICAL SURVEY OF MARKET SERVICES PRICES

Prices of market services are surveyed monthly from ca. 600 selected economical subjects (respondents). Statistical statement Cený TS 1-12 (Monthly statement of prices of market services) is used for the purpose of price survey. Over 300 individual items (representatives), which represent selected areas of services, are defined in this statement.

### Selection of respondents

The statistical survey of prices of market services uses sample survey method, ie. economical subjects with the highest annual sales in the monitored sector are selected to the sample of respondents. The sample of reporting units is proportionally replenished by medium-sized enterprises.

### Selection of representatives

The objective, when selecting representatives, is find such a service which appropriately represents given group or class of services within the Classification of product by activity CZ-CPA. The selected service must comply with further criteria as clear definability, quality stability in time and significance of the selected service in terms of the overall company activities.

### Average prices

The surveyed prices are without VAT, because they should reflect the revenues received by producer.

„**The average prices of selected market services**” have been published quarterly since January 1998. Representatives are chosen so that their average price is guaranteed by reliable sample of respondents.

### Data collection

The Czech Statistical Office (CZSO) offers the possibility of electronic reporting for easier and faster data collection from respondents instead of filling out data to the printed statistical statement. The essence of electronic method of data collection is filling out interactive PDF form, which is saved on website of CZSO. The content of this form is tailored to the individual reporting respondents.

## REVISION AND ITS HISTORY

The purpose of revision is actualization of making system of price statistics, particularly by reason of accumulated changes in real described field. This actualization concerns to samples of representatives and respondents, weighting scheme, price basis and concept of calculation. The revisions are planned and they are usually performed in five-year periods.

### Revision history of price index of market services after 1989

The first price indices of the selected market services (domestic freight transport and sewerage charges) were published in January 1994. They were calculated on the weights from 1990 to the price and index base “January 1990 = 100”.

After revision in 1994, the indices for the period 1995 to 2000 were calculated on the weights from 1993 to the price and index base “December 1993 = 100” and to the derived index base “1994 and 1995 average = 100”.

After revision in 2000, the indices for the period 2001 to 2006 were calculated on the weights from 1999 to the price and index base “December 1999 = 100” and to derived index base “2000 average = 100”.

After revision in 2005, the indices for the period 2007 to 2012 were calculated on the weights from 2005 to price and index base "2005 average = 100".

There was a change of classification during 2008 and since January 2009, all price indices have been compiled, counted and published in Classification of product by activity CZ-CPA 2008.

After revision in 2012, the indices for the period 2013 to 2017 were calculated on the weights from 2011 to index base "2005 average = 100".

After revision in 2017, the indices for the period 2018 to 2022 are calculated on the weights from 2015 to index base "2015 average = 100".