

Producer Price Index for Services

2010=100

Handbook for Users

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Foreword

Statistics Finland began publishing a revised Producer Price Index for Services in April 2012. The base year of the revised Producer Price Index for Services is 2010. The handbook's structure and methodological description are based on the previous Handbook for User's, compiled for the Pro-

ducer Price Index for Services with 2005 as the base year. The descriptions and methods of the revised indices have been updated in this handbook. Pirkko Hemmilä, Suvi Kivi, Ilkka Lehtinen and Toni Udd participated in the updating of this handbook.

Helsinki, Statistics Finland, December 2012

Kari Molnar

Director, Prices and Wages

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1 Introduction

Statistics Finland has revised the Producer Price Index for Services. The new base year of the index is 2010. In connection with the revision, the weight structure of the index was changed to correspond to service structures in 2010. In addition, the service product and enterprise samples were updated.

New industries added to the overall index are as follows:

- 491 Passenger rail transport, interurban;
- 56 Food and beverage service activities;
- 6831 Real estate agencies;
- 85 Education;
- 86 Human health activities;
- 90 Creative, arts and entertainment activities;

- 93 Sports activities and amusement and recreation activities
- 95 Repair of computers and personal and household goods.

At the moment, point figures are calculated for 39 industries. The overall index covers 57 per cent of market services. In the 2005=100 index the coverage was about one half.

Starting from the first quarter of 2012, the Producer Price Indices for Services are released on the 24th day of the month following the statistical reference quarter, or on the first weekday following it.

2 Producer Price Index for Services within the system of statistics on prices

The Producer Price Index for Services complements the picture the Index of Producer Prices of Agricultural Products, the Producer Price Index for Manufactured Products and the Consumer Price Index draw of price changes in the national economy. The Producer Price Index for Services describes developments in the prices of services enterprises produce for each other and for the public sector. For the time being, the European Union regulations defining compilation of statistics exclude services directed to consumers from the scope of the description of the statistics. Changes in the prices of consumer services are measured by the Consumer Price Index. It is globally quite common that the Producer Price Index for Services describes the price development of both business services and services offered to households. Some European Union countries also compile voluntarily such indices that supplement the supply of statistics.

Where necessary, users of statistical information can utilise the data of the Producer Price Index for Services and the Consumer Price Index on prices changes of services.

2.1 Description of the Producer Price Index for Services

The importance of services to the national economy has grown significantly in the past few decades. At the moment, the service sector accounts

for over 65 per cent of Finland's GDP. Of this, public services have a share of around 25 per cent and private market services a share of 75 per cent. The large share of the services sector has also generated increased demand for statistics on service industries.

The Producer Price Index for Services is a quarterly index that measures developments in the prices of services enterprises produce for each other and for the public sector. The Index describes relative changes in these prices against a certain comparison point in time. The base year of the index is 2010. The scope of the Producer Price Index for Services does not extend to services intended for consumers or those produced by the public sector. Developments in the prices of the services purchased by consumers are monitored with the Consumer Price Index.

The Producer Price Index for Services is compiled on product basis. The index describes development in the prices of certain types of services irrespective of the main industry of the enterprise. If a service enterprise also produces goods, its goods production is excluded from the scope of the description of the Producer Price Index for Services. On the other hand, an enterprise that mainly produces industrial goods may also produce other services than manufacturing services, in which case its services production is included in the scope of the description of the Producer Price Index for Services.

One of the key tasks of the Producer Price Index for Services is to function as a deflator in

national accounts calculations for converting the value of production or sales to the volume of production. In addition, Producer Price Indices for Services can be used for describing short-term inflationary pressures on various sectors of the economy. Enterprises can use the data of the statistics when comparing the development in the prices of their purchases or sales against the average development in their respective industry.

The statistics are released on the 24th day of the month following the statistical reference quarter, or on the following weekday to it. The production of the statistics is based on the Finnish Statistics Act (280/2004) and on the EU Regulations concerning short-term statistics (1165/1998 and 1158/2005).

At the moment, Producer Price Indices for Services are calculated for 39 service industries and published quarterly for 34 industries. Price indices have been designed for the priority industries specified in the EU Regulation, as well as for a few other nationally important service industries. The lengths of the time series vary by industry depending on when the production of each industry-specific index was started. Industries are classified by the national standard industrial classification TOL2008, confirmed by Statistics Finland, and based on the common industrial classification NACE Rev. 2 of the European Union.

The index currently covers 57 per cent of market services. Statistics Finland continues to improve the coverage by designing indices for additional service industries. The publication of a new index can commence once a sufficiently long time series is available of the price data on an industry and it has been ascertained that the price data provided by the data suppliers can be used

for calculating sufficiently reliably index figures depicting the average price development in the industry concerned.

2.2 Commodity price index system

The price indices concerning commodities compiled by Statistics Finland can be described as a system whose aim is to measure the development of prices at different stages of production and distribution. The producer price indices of agricultural products, for manufactured produces and for services describe the price development at the early stage of price formation as products leave their producers or enter the country. The price index for wholesale goods would locate in the second stage of distribution. Statistics Finland does not compile a price index for wholesale goods. Wholesale and retail trade margins come under the scope of description of Producer Price Indices for Services. Statistics Finland does not compile price indices for trade margins. In the industrial classification, they mainly come under categories 46 Wholesale trade and 47 Retail trade; wholesale and retail trade of motor vehicles is differentiated into category 45. Development in the prices of consumption goods and services at the end use stage is measured by the Consumer Price Index.

Figure 1 describes the commodity price index system and the indices associated with each step of the system. For the time being, price indices are not produced for wholesale goods or trade margins.

Figure 1.
Commodity price index system

	Producer			Wholesale trade			Retail trade	
Prices of production inputs	Producer's margin	Producer price, price at/to border	Purchase price into wholesale trade	Wholesale trade margin	Sale price of wholesale goods	Purchase price into retail trade	Retail trade margin	Price of retail trade goods and services
Purchase price indices for production inputs, cost indices		Producer price indices (incl. PPI for Construction)		Industry G46, Wholesale trade of PPI for Services	Wholesale Price Index		Industry G47, Retail trade of PPI for Services	
Indices compiled by Statistics Finland								
Index of Purchase Prices of the Means of Agricultural Production		Index of Producer Prices of Agricultural Products, Producer Price Index for Manufactured Products, Producer Price Index for Services, Export Price Index, Import Price Index						Consumer Price Index

3 Sampling and price monitored services

The calculation of the Producer Price Index for Services is based on a sample. The price data used to calculate the index are collected from enterprises selected to the sample. This price index is considered as being descriptive of the average development in the prices of all services produced for enterprises. The group of service enterprises included in the Producer Price Index for Services is checked mainly every five years. Smaller updates are constantly made to the enterprise sample, because changes take place in the activity of enterprises.

Statistics Finland's Business Register and Business Services Statistics are used as the sampling frame for the Producer Price Index for Services. The Business Register contains data on the industry and turnover of enterprises. Business Services Statistics describe the structure of turnover and services produced in certain branches of industry providing business services. Industry-specific indices have been designed independent of each other and the used sampling method varies by industry. Depending on the industry, data suppliers have been selected by applying PPS (Probability Proportional to Size) sampling or judicious sampling, or by combining judicious and probability-based sampling.

Services whose prices are followed quarterly are selected in co-operation with data providers. The objective is that the examined services would be as representative as possible and could be monitored as well as possible. The following criteria are used in selecting the services to be monitored:

- The service is as representative as possible. It generates a significant share of the enterprise's turnover.
- The service describes as well as possible the average price development of the services belonging to the same service entity.
- A price concerning a certain unit (e.g. number or day) and quality can be quoted regularly by quarter (or less frequently) for the service. The price must be comparable between statistical reference quarters.

The Producer Price Index for Services is calculated using over 17,000 price data items collected from approximately 350 data suppliers. The numbers of price data items and data suppliers vary by industry. Roughly 15,000 of the price data items concern leasing of office and business premises.

4 Weight structure

The industry-specific indices of the Producer Price Index for Services describe the average development of prices in the industry concerned. The industry-specific indices, such as the overall index, are Laspeyres indices with fixed quantities. The geometric means of price ratios calculated for individual service products are added up to an enterprise's indices for service entities, to so-called main group indices, which are then weighted to an overall index for the industry with a weighting

coefficient assigned for each service entity. The weighting coefficients are based on data on the enterprises' turnover and their breakdown by the main service entities of each enterprise. The used data on turnover are either data reported by the enterprises themselves on turnover received from services within the industry concerned or data on turnover obtained from the Register of Enterprises and Establishments or from the Business Services Statistics. The individual service products

Figure 2.
Formation of the weight structure of the industry-specific indices

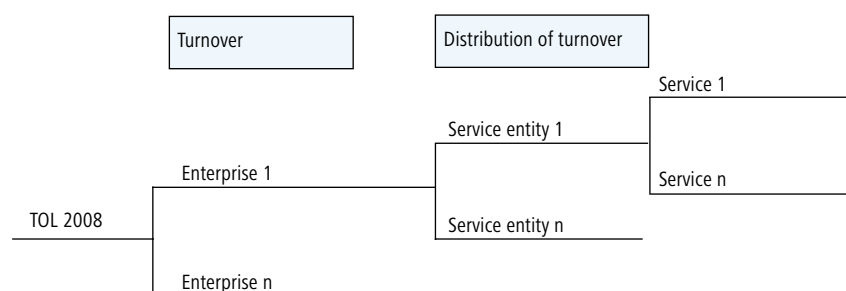


Table 1.
Two-digit weight structure of Producer Price Index for Services 2010=100

Industry	Name	Share, %
G	Wholesale and retail trade	—
45	Wholesale and retail trade and repair of motor vehicles and motorcycles	—
46	Wholesale trade, except of motor vehicles and motorcycles	—
47	Retail trade, except of motor vehicles and motorcycles	—
H	Transportation and storage	23,3
49	Land transport and transport via pipelines	12,0
50	Water transport	1,5
51	Air transport	3,2
52	Warehousing and support activities for transportation	4,2
53	Postal and courier activities	2,4
I	Accommodation and food service activities	2,4
55	Accommodation	1,0
56	Food and beverage service activities	1,4
J	Information and communication	22,1
58	Publishing activities	2,3
59	Motion picture, video and television programme production, sound recording and music publishing	—
60	Programming and broadcasting activities	0,4
61	Telecommunications	3,9
62	Computer programming, consultancy and related activities	13,5
63	Information service activities	2,0
K	Financial and insurance activities	—
64	Financial service activities, except insurance and pension funding	—
65	Insurance, reinsurance and pension funding, except compulsory social security	—
66	Activities auxiliary to financial services and insurance activities	—
L	Real estate activities	9,7
68	Real estate activities	9,7
M	Professional, scientific and technical activities	28,1
69	Legal and accounting activities	3,5
70	Activities of head offices; management consultancy activities	8,6
71	Architectural and engineering activities; technical testing and analysis	11,2
72	Scientific research and development	—
73	Advertising and market research	4,8
74	Other professional, scientific and technical activities	—
75	Veterinary activities	—
N	Administrative and support service activities	11,2
77	Rental and leasing activities	3,7
78	Employment activities	2,8
79	Travel agency, tour operator and other reservation service and related activities	—
80	Security and investigation activities	0,8
81	Services to buildings and landscape activities	3,9
82	Office administrative, office support and other business support activities	—
O	Public administration and defence; compulsory social security	—
84	Public administration and defence; compulsory social security	—
P	Education	0,7
85	Education	0,7
Q	Human health and social service activities	0,9
86	Human health activities	0,9
87	Residential care activities	—
88	Social work activities without accommodation	—
R	Arts, entertainment and recreation	0,5
90	Creative, arts and entertainment activities	0,2
91	Libraries, archives, museums and other cultural activities	—
92	Gambling and betting activities	—
93	Sports activities and amusement and recreation activities	0,3
S	Other service activities	1,0
94	Activities of membership organisations	—
95	Repair of computers and personal and household goods	0,6
96	Other personal service activities	0,4
96	Muut henkilökohtaiset palvelut	0,4

selected by the data suppliers do not have their own weights, but data on them are used to calculate a service entity index/main group index for each data supplier as a geometric average of the price ratios of the service products.

The overall index is calculated from the industry-specific indices. The weights are based on national accounts data from 2008 on the use of services by enterprises and the public sector. The data are inflated by means of usage data for 2010 to describe the service structures for the year 2010: value data are thus from 2010 but more

precise structures are based on the distributions in 2008. The industry-specific weights have been formed by dividing first the total volume of service industries expressed in euros to the alphabetical main activity level, then to the 2-digit level and from there up to the 4-digit level according to relative use. The 2-digit weight structure of the overall index is presented in Table 1. A more detailed weight structure can be found on the home pages of the statistics at: http://tilastokeskus.fi/til/pthi/pthi_2012-04-24_men_001_en.html

5 *Collection of price data*

The price data for the Producer Price Index for Services are collected mainly from enterprises. The data are collected with a web collection system and by email. Besides the data collected direct from enterprises, price data and point figures from the Consumer Price Index are also utilised in the compilation of the Producer Price Index for Services. In addition, price data on office and business facilities are provided by KTI Property Information Ltd.

Depending on the industry, the time of quoting the price data collected from enterprises may be the first, second or third month of the quarter

under review. In industries with volatile prices, such as freight transport by road and sea, collected are charged unit prices over the whole quarter under review.

The pricing method used in the Producer Price Index for Services varies by industry and enterprise. The transaction price can often be used for identically repetitive services. For other services, the employed method could be based on a unit value, model pricing or the time used for producing the service.

The nonresponse rate of the price inquiry has been one to two per cent, on average.

6 *Quality changes and missing price observations*

The Producer Price Indices for Services are “pure” price indices, which must not be affected by changes in the quality of the services. Qualitative changes and their treatment are among the main challenges in index calculations. In the Producer Price Indices for Services, changes in quality are controlled for with several methods.

In the first place, efforts are made to collect an overlapping price observation for the changed product. In practice, this means that as the product changes the price of the preceding quarter is collected in addition to the price of the reference quarter. This allows the change in price to be calculated and the price history stays unbroken despite the change in the monitored product. The idea of the method is based on an assumption of perfect markets and rational consumers: prices of similar services must be the same at a certain time point, or conversely, the price difference on the market indicates that the qualities of the services differ from each other. Because the services have

been available on the market at the same time point, the price difference of the service must be equal to the quality difference, because buying of an overpriced service is not justified.

If overlapping observations cannot be obtained, in some cases the old price can be carried forward. The method is applied in the Producer Price Index for Services only if the price of the service to be monitored is not obtained for some reason during the statistical reference quarter and the price development of the service product concerned is stable. If the data are not obtained in two successive quarters, the data supplier is requested to select in its place a new service product (case: a permanently missing observation). The price of a temporarily missing observation can thus be carried forward if it is a service with a stable price development. In contrast, the missing prices of service products with a volatile price development are always imputed by means of other corresponding products or the price development

in the industry. Imputation is based on the assumption that the price development of a certain service is the same as that of corresponding services. Permanently missing services are replaced with new service products.

Use of the following methods can also be optionally used in quality change cases:

- The quality of the changed product is assumed to be the same as that of the earlier product. In this case, the price change is allowed in the index as such.
- The price change is assumed to derive entirely from a change in quality, in which case the index does not change at all as the service changes.
- Quantity adjustment is used if the occurred price change derives fully or partially from a change in the quantity of the monitored service.
- An expert assessment where the data supplier is asked to assess which proportion of the price change is a pure change in price and which proportion is due to a change in the quality of the service. Then the impact of

a quality change is eliminated from the price change. The expert assessment is based on the idea that the data supplier enterprise is best equipped to assess the price development and formation of its own service products.

- An expert assessment based on some other source. Discretionary changes may be made in certain cases to the index if more accurate information on the development of the price of an examined service is available from some other source. This may also be done if for some reason the employed method does not measure the realised development correctly, e.g. by ignoring some significant change that has taken place on the market.

Methodologies to control for changes in quality are constantly being developed and international guidelines and recommendations are taken into account when applying different methods. A good list of sources is the bibliography of the chapter on this issue in the OECD's methodological manual <http://www.imf.org/external/np/sta/tegppi>.

7 Contents of industry-specific indices

Table 2 presents the content of the industry-specific indices of the Producer Price Index for Services. The use of the Consumer Price Index series is based on that enterprise and household

consumers pay the same prices for services or the price development of services is similar even if there were differences in, say, the price level and even service products.

Table 2.
Industry-specific indices and the services included in them

Industry	Services
491 Passenger rail transport, interurban	The Passenger transport by railway index of the Consumer Price Index (COICOP 07.3.1.1)
4932 Taxi operation	The Passenger transport by taxi index of the Consumer Price Index (COICOP 07.3.1.1)
4941 Freight transport by road	Transport of parcelled goods, part and full vehicle load transports, road tanker transports, forestry transports, transport services for manufacturing and temperature-controlled vehicle transports
5020 Sea and coastal water transport	Transport of cargo by sea: containers, transport of frozen and refrigerated goods, tanker transport, transport services for manufacturing, dry bulk cargo and general cargo (trailers, etc.)
51 Scheduled air transport	Transport of freight and passengers. The index point figures are not public
5210 Warehousing and storage	Storage and warehousing proper (in outdoor, indoor, warm, cold, frozen, tank or silo depots) and transshipments of goods
5224 Cargo handling	Stevedoring services for vessels (on and off loading of cargo)
53 Post and courier activities	Transport of postal items (letters and parcels) and other distribution and courier activity
5510 Hotels	Hotel room on a weekday
56 Food and beverage service activities	The Catering services index of the Consumer Price Index (COICOP 11.1)
58 Publishing activities	Publishing of books, newspapers, periodicals, catalogues and software
60 Programming and broadcasting activities	Advertising prices of radio and television stations. The point figures are not public
61 Telecommunications	Services in fixed line network (Internet and talk), and mobile calls, text messages and mobile Internet
62 Computer programming, consultancy and related activities	Software design, computer programming and consultancy and hardware consultancy
63 Information service activities	Data processing services, hosting and related activities; web portals, news agency services, other information service activities
6820 Leasing of office and business premises	Separate indices for rents of office and business premises
6931 Real estate agencies	The real estate agency fee index of the Consumer Price Index (COICOP 04.2.4.1.1.1)
6910 Legal activities	Legal advisory service activities
6920 Accounting, book-keeping and auditing activities; tax consultancy	Book-keeping, compiling of financial statements, payroll accounting, services related to taxation and auditing
7022 Management consultancy activities	Consultancy services for general administration, consultancy services for financial administration (not connected with corporate taxation), consultancy services for personnel management, consultancy service for production, communication services and other business management consultancy services
711 Architectural and engineering activities and related technical consultancy	Architectural services and community planning, technical services for civil engineering, structural engineering services, heating, plumbing and air-conditioning design services, electrical engineering design services and mechanical and process engineering design services
712 Technical testing and analysis	Inspection of motor vehicles and other testing, inspection, measurement and validation services
731 Advertising	Design services of advertising and media agencies, sales of advertising space, advertising on radio, newspapers and periodicals, and television advertising
732 Market research and public opinion polling	Diverse market research and opinion poll surveys
7732 Renting of construction and civil engineering machinery and equipment	Passenger hoists, scaffolding, weather shelters and site facilities, heating devices, electricity switchboards, pumps, drilling and chipping machines and other machinery and equipment
7820 Temporary employment agency activities	Labour hire activities
8010 Private security activities	Guarding services
811 Combined facilities support activities	Facilities support activities
812 Cleaning activities	Cleaning services used by enterprises and the public sector
85 Education	The Education not definable by level index of the Consumer Price Index (COICOP 10.5.0.1)
86 Human health activities	Services connected to occupational health care: general practitioner and specialist, public health nurse, laboratory services, imaging services, general charges
90 Creative, arts and entertainment activities	The Other cultural services and Theatres and operas indices of the Consumer Price Index (COICOP 09.4.2.6 and COICOP 09.4.2.1.2)
93 Sports activities and amusement and recreation activities	The Recreational and sporting services indices of the Consumer Price Index (COICOP 09.4.1)
95 Repair of computers and personal and household goods	The Repair of household appliances index of the Consumer Price Index (COICOP 05.3.3.1)
96011 Washing and dry-cleaning services for enterprises	Washing and drycleaning services used by enterprises and the public sector

8 Description of index calculation

The overall index of the Producer Price Index for Services describes the average development in the prices of the industries covered by the index. First, geometric means are calculated for service product entities, or main groups, of each enterprise from price ratios (= current price/previous quarter's price) deduced from individual service products. These micro indices are combined into enterprise-specific/industry-specific indices/overall index by weighting each micro index with its own weighting coefficient. Thus, the size of the impact on the index from changes in the prices of individual enterprises and services varies.

In practice, indices for point in time t are calculated as follows:

The micro index is the enterprise's given service product entity or main group which contains 1– n different service products. At first, the price ratios of individual services of each main group of each enterprise are used to calculate geometric means for them: the average change from the previous quarter in the prices of the main group. The micro indices of the previous period ($t-1$) are carried forward with this change.

$$I_{major_group,t} = \exp\left(\frac{1}{n^t} \sum_{i=1}^{n^t} \ln\left(\frac{P_{it}}{P_{i(t-1)}}\right)\right) \cdot I_{major_group,t-1}$$

for all enterprises and all main groups. The number of services belonging to the enterprise's main group may fluctuate in time. However, either a genuine or imputed price observation should be found for the service for the reference and comparison periods for it to be included in the calculation.

Enterprise-specific indices are calculated with these micro indices. Data on the distribution of an enterprise's turnover by main group are used as fixed weights. The distribution always sums up.

$$I_{enterprise,t} = \sum_{k=1}^K w_{major_group(k)} \cdot I_{major_group(k),t}$$

where K is the number of main groups of an enterprise.

These indices for individual enterprises are weighted together into an industry-specific price index. As the weight use is made of data on the enterprise's pure turnover from each industry or sample weights, in which case enterprises with a large turnover are included with their own weights and smaller enterprises share the industry's end weight evenly (weighting based on PPS sampling).

$$I_{industry,t} = \sum_{s=1}^S w_{enterprise(s)} \cdot I_{enterprise(s),t}$$

where S is the number of enterprises included in an industry in the index. W represents an enterprise's share of the total turnover of all enterprises in the industry.

Finally, the overall index is obtained by weighting together the industry-specific indices with the weights for each industry.

$$I_{total,t} = \sum_{l=1}^L w_{industry(l)} \cdot I_{industry(l),t}$$

where L is the number of industries and w an industry's share of the overall index. The calculation of the enterprise-specific indices is in a way unnecessary: the same results could be obtained by dividing the weight of an industry direct to the micro level, i.e. enterprises and their main groups. However, to assess the reliability of the results and facilitate the necessary verifications, the calculation proceeds in the manner described above.

9 Possible sources of error in the Producer Price Index for Services

Scientific literature on indices often refers to the substitution bias that the Laspeyres' index formula may create. The direction of the bias depends on the target of measurement. In the case of the Producer Price Index for Services, substitution bias may arise because when maximising

their profits, enterprises react to changes in relative prices and shift the emphasis of their activity. Then an index calculated with the Laspeyres' formula underestimates price development from the enterprises' perspective. In the Consumer Price Index, the possible substitution bias is exactly

the opposite as consumers shift their consumption to commodities that have become relatively cheaper. The significance of the substitution bias depends on the scale and speed at which individual enterprises are able to redirect their activities when relative prices change.

Fixed-quantity indices may contain a bias resulting from the entry of new products or services on the market and from that if strong changes take place in the service structures and weight relations between industries. When new services are mentioned reference is often made to data processing services the production and sales of which can grow quite rapidly in the course of a five-year time span. If there is vigorous change, an index may not describe accurately enough the average development in the prices of the services produced in the economy. However, the bias caused by new services is not that significant in practice, because a new service can be added to the ones monitored with

the index if the volumes of its production and sales have increased significantly.

The objective of producer prices indices is to describe pure price development. Therefore, changes in the quality of products must be taken into consideration in their calculations. The problem of quality change is usually encountered either when a data supplier reports that a service or product on which data are collected is no longer produced, imported or exported, or that changes have been made to the service or product concerned. The quality adjustment methods used in the Producer Price Index for Services are described in Section 6.

Other factors that have a bearing on the precision of the index are the accuracy of the data on which the sampling frame and weight structure are based, sampling error, possible errors in the reporting of individual data items, and non-response.

10 Publication of the Producer Price Index for Services and provision of other information from it

The Producer Price Index for Services is released quarterly on the 24th day of the month following the statistical reference quarter, or on the nearest weekday after it on Statistics Finland's website at: http://tilastokeskus.fi/til/pthi/index_en.html.

The published point figures for Producer Price Indices for Services are available in Statistics Finland's StatFin database service. The service is free of charge and located under Tables on the web page of the Producer Price Indices for Services. In addition, a monthly publication is produced of the Producer

Price Indices for Services, which can be downloaded free in pdf format from Available products and services on the web page of the statistics.

In addition, the Producer Price Index for Services is published in Bulletins of Statistics, the Statistical Yearbook of Finland and in the Producer price indices publication. Eurostat releases point figures for Producer Price Indices for Services on its website under Industry, trade and services / Short-term business statistics / Trade and services / Other Services.

11 Usages of the Producer Price Indices for Services

All producer price indices can be used for describing short-term inflationary pressures on various sectors of the economy. Especially central banks and government ministries utilise producer price indices for this purpose. Many enterprises, such as investment banks, and research institutes can also exploit the data in their macroeconomic forecasting models.

One of the key purposes for which the Producer Price Index for Services is used is as a deflator in national accounts calculations. With it the change in the value of production or sales is converted to change in the volume of production.

Producer price indices can be used as an index clause in agreements. An index clause means that the final amount of a payment specified in an

agreement is tied to a change in some index. Indexing is a means of seeking protection against inflationary risks. In practice, an index clause is usually attached to long-term agreements. Restrictions on the use of an index clause are laid down in the Act on Limiting the Use of Index Clauses.

Enterprises can utilise the data from producer price indices for comparing the prices of their purchases or the services they have sold against the average price development.

The data from the Producer Price Index for Services can be combined with other data on business trends, such as those on the turnover of service industries in order to analyse business trends more closely.

12 Calculating with indices

12.1 Calculating change

The change in index figures between two points in time is usually calculated as a percentage. The change percentage is calculated as follows:

$$\frac{I_t - I_0}{I_0} \cdot 100,$$

where I_t = index for the reference point in time and I_0 = index for the comparison point in time.

Example: What is the change in the price index for an example industry from the first quarter of 2010 to the third quarter of 2011? The point figure for the first quarter of 2010 is 98.4 and the point figure for the third quarter of 2011 is 100.2. The change in question is

$$\frac{100,2 - 98,4}{98,4} \cdot 100 \approx 1,8$$

i.e. a rise of 1.8 per cent.

12.2 Deflation and volume calculations

Price indices, such as the Producer Price Index for Services, can be used as deflators in volume calculations. In such instances, the change in a

certain value, such as the value of the sales of an enterprise (value index), is known. To find out the change in the volume over the same time period, a suitable price index, such as the Producer Price Index for Services or one of its sub-indices is used as a deflator. The volume index is calculated according to the following formula:

$$\text{Volume index} = \frac{\text{value index}}{\text{price index}} \cdot 100$$

Example: The value of the sales of an enterprise went up by 8.9 per cent from 2010 to 2011. The prices of the services the enterprise sells rose by 0.3 per cent over the same period. The change in the volume of the sales was:

$$\frac{108,9}{100,3} \cdot 100 \approx 108,6$$

The growth in the volume from 2010 to 2011 was 8.6 per cent.

Further information about index calculations can be found in the Indices module of the eCourse in Statistics on Statistics Finland's website and in Section 11 of Producer Price Indices 2010=100, User's Handbook http://tilastokeskus.fi/til/thi/thi_2012-09-10_men_001_en.html

Appendix 1

Weight structure and coverage of Producer Price Index for Services

Service industries according to TOL2008 (Nace Rev. 2)		Industry's share of all services	Coverage of indices	Share of indices of overall index	Internal weight structure of indices
G	Wholesale and retail trade	18,8	–	–	
45	Wholesale and retail trade and repair of motor vehicles and motorcycles	3,0	–	–	
46	Wholesale trade, except of motor vehicles and motorcycles	9,6	–	–	
47	Retail trade, except of motor vehicles and motorcycles	6,2	–	–	
H	Transportation and storage	17,4	83,4	23,3	
49	Land transport and transport via pipelines	9,0	90,7	12,0	
	4910 Passenger rail transport, interurban				0,6
	4932 Taxi operation				7,5
	4941 Freight transport by road				91,9
50	Water transport	1,1	59,9	1,5	
	5020 Sea and coastal freight water transport				100,0
51	Air transport	2,4	100,0	3,2	
52	Warehousing and support activities for transportation	3,2	49,0	4,2	
	5210 Warehousing and storage				40,7
	5224 Cargo handling				59,3
53	Postal and courier activities	1,8	100,0	2,4	
	5310 Postal activities under universal service obligation				83,2
	5320 Other postal and courier activities				16,8
I	Accommodation and food service activities	1,8	99,4	2,4	
55	Accommodation	0,7	98,6	1,0	
	5510 Hotels				100,0
56	Food and beverage service activities	1,1	100,0	1,4	
J	Information and communication	16,5	98,3	22,1	
58	Publishing activities	1,7	100,0	2,3	
	581 Publishing of books, periodicals and other publishing activities				68,3
	582 Software publishing				31,7
59	Motion picture, video and television programme production, sound recording and music publishing	0,3	–	–	
60	Programming and broadcasting activities	0,3	100,0	0,4	
	601 Radio broadcasting				16,0
	602 Television programming and broadcasting activities				84,0
61	Telecommunications	2,9	100,0	3,9	
62	Computer programming, consultancy and related activities	9,9	100,0	13,5	
63	Information service activities	1,5	100,0	2,0	
	631 Data processing, hosting and related activities; web portals				96,8
	639 Other information service activities				3,2
K	Financial and insurance activities	4,1	–	–	
64	Financial service activities, except insurance and pension funding		–	–	
65	Insurance, reinsurance and pension funding, except compulsory social security		–	–	
66	Activities auxiliary to financial services and insurance activities		–	–	
L	Real estate activities	7,3	95,2	9,7	
68	Real estate activities	7,3	95,2	9,7	
	6820 Rents of office and business premises				97,0
	6831 Real estate agencies				3,0
M	Professional, scientific and technical activities	21,0	54,5	28,1	
69	Legal and accounting activities	1,9	100,0	3,5	
	6910 Legal services				41,7
	6920 Accounting, book-keeping and auditing activities				58,3
70	Activities of head offices; management consultancy activities	4,5	27,5	8,6	
	7020 Business and other management consultancy				100,0
71	Architectural and engineering activities; technical testing and analysis	5,8	100,0	11,2	
	711 Architectural and engineering activities				87,2
	712 Technical testing and analysis				12,8
72	Scientific research and development	5,1	–	–	
73	Advertising and market research	2,5	100,0	4,8	
	731 Advertising				94,9
	732 Market research and public opinion polling				5,1
74	Other professional, scientific and technical activities	1,2	–	–	
75	Veterinary activities	0,0	–	–	

Appendix 1 (continued)

Weight structure and coverage of Producer Price Index for Services

Service industries according to TOL2008 (Nace Rev. 2)		Industry's share of all services	Coverage of indices	Share of indices of overall index	Internal weight structure of indices
N	Administrative and support service activities	8,4	53,6	11,2	
77	Rental and leasing activities	2,2	14,1	3,7	
	7732 Renting of construction and civil engineering machinery				100,0
78	Employment activities	1,7	88,0	2,8	
	7820 Temporary employment activities				100,0
79	Travel agency, tour operator and other reservation service and related activities	0,1	–	–	
80	Security and investigation activities	0,5	100,0	0,8	
	8010 Private security activities				100,0
81	Services to buildings and landscape activities	2,4	92,0	3,9	
	811 Combined facilities support activities				50,5
	812 Cleaning activities				49,5
82	Office administrative, office support and other business support activities	1,5	–	–	
O	Public administration and defence; compulsory social security	2,4	–	–	
84	Public administration and defence; compulsory social security		–	–	
P	Education	0,5	100,0	0,7	
85	Education	0,5	100,0	0,7	
Q	Human health and social service activities	0,7	97,8	0,9	
86	Human health activities	0,7	100,0	0,9	
87	Residential care activities		–	–	
88	Social work activities without accommodation		–	–	
R	Arts, entertainment and recreation	0,4	89,1	0,5	
90	Creative, arts and entertainment activities	0,2	100,0	0,2	
91	Libraries, archives, museums and other cultural activities		–	–	
92	Gambling and betting activities		–	–	
93	Sports activities and amusement and recreation activities	0,2	100,0	0,3	
S	Other service activities	0,8	61,6	1,0	
94	Activities of membership organisations	0,3	–	–	
95	Repair of computers and personal and household goods	0,3	100,0	0,6	
96	Other personal service activities	0,2	89,7	0,4	
	9601/1 Washing and dry-cleaning services for enterprises				100,0
Total	100,0	57,4	100,0	

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