

**Documentation of statistics for  
Producer Price Index for Services 2021**

## **1 Introduction**

The purpose of these statistics, is to analyze price trends in the first stage of commercial transaction of services, i.e. producers' selling prices to other producers (business to business), ex VAT. These statistics have been compiled since 2006.

## **2 Statistical presentation**

The *Producer Price Index for Services* is a quarterly measurement of service prices relating to the first commercial transaction (business to business), for the domestic market and export. The statistics contains a number of service price indices in different industries, e.g. price indices for transport services, consultancy services and cleaning services etc.

## 2.1 Data description

The *Producer Price Index for Services* publishes 12 different quarterly price indices for services, within selected industries in the service sector. These industries are selected based on EU regulation, which enables international comparison between member states.

The indices are compiled based on collected service prices from companies in Denmark. Prices are measured as producers' selling price (business to business) ex VAT. Prices are e.g. collected for; transport from A to B, hourly rates for legal services and cleaning of office areas.

The indices that are being produce are the following industries (DB07 industry code is in the paraenthesis):

### **Transportation and Storage**

-Freight transport by road and removal services (49.4) -Freight transport by road (49.41.00) - Removal services (49.42.00) -Sea and coastal transport of passengers and freight (50.1 and 50.2) - Air transport (51) -Passenger air transport (51.1) -Freight air transport and space transport (51.2) - Warehousing and support activities for transportation (52) -Warehousing and storage (52.1) - Support activities for transportation (52.2) -Service activities incidental to land transportation (52.21) -Service activities incidental to water transportation (52.22) -Service activities incidental to air transportation (52.23) -Cargo handling (52.24) -Other transportation support activities (52.29) - Postal and courier activities (53) -Postal activities under universal service obligation (53.1) -Other postal and courier activities (53.2)

### **Information and Communication**

-Telecommunications (61) -Computer programming, consultancy and related activities (62) - Information service activities (63)

**Real Estate Activities** -Real Estate Activities(68) -Rental and operating of own or leased real estate (68.20.40) -Real estate agencies (68.31.10) -Management of real estate on a fee or contract basis (68.32.10)

### **Professional, Scientific and Technical Activities**

-Legal and accounting activities (69) -Legal activities (69.10.00) -Accounting, bookkeeping and auditing activities; tax consultancy (69.20.00) -Legal activities, accounting, bookkeeping and management consultancy activities (69 og 70.22) -Business and other management consultancy activities (70.22.00) -Engineering activities and related technical consultancy (71) -Architectural activities (71.11) -Engineering activities and related technical consultancy (71.12) -Technical testing and analysis (71.20) -Advertising and market research (73)

### **Administrative and Support Service Activities**

-Employment activities (78) -Security and investigation activities (80) -Cleaning activities (81.2)

## 2.2 Classification system

The *Producer Price Index for Services* follows the industry division in the [Danish Industrial Classifications 2007 \(DB07\)](#). DB07 is a subdivision of the common European industry nomenclature, the four-digit NACE rev. 2. Below the DB07 industries, services are grouped into so-called *CPA-groups*, in accordance with the [Statistical Classification of Products by Activity](#) in the European Economic Community, 2008 version. Statistics Denmark is obliged to report quarterly producer price indices to Eurostat in accordance with the following groupings:

- 49.4 Freight transport by road and removal services
- Sum of 50.1 and 50.2 Sea and coastal water transportation of passengers and freight (confidential)
- 51 Air transport (confidential)
- 52.1 Warehousing and storage services
- 52.24 Cargo handling services
- 53.1 Postal activities under universal service obligation (confidential)
- 53.2 Other postal and courier services
- 61 Telecommunications (under development)
- 62 Computer programming, consultancy and related services
- 63 Information services
- Sum of 69.1 Legal services, 69.2 Accounting, bookkeeping and auditing services; tax consultancy and 70.2 Management consulting services
- 71 Architectural and engineering services, technical testing and analysis
- 73 Advertising and market research services
- 78 Employment services
- 80 Security and investigation services
- 81.2 Cleaning services

## 2.3 Sector coverage

Services sector.

## 2.4 Statistical concepts and definitions

**Unit price:** A price that can only be calculated when both turnover and the number of goods or services sold is known. The price is calculated by dividing revenue by the number of units sold, to an average price for a quantity of comparable goods or services.

**Contract price:** Actual selling price of repeat product or service to the same customer, as specified in a contract between parties. The price is typically changes due to contact regulation with a specified index, or if the contract is renegotiated.

**Hourly list rate:** The hourly rate quoted in the manufacturer's price list. List hourly rates may vary for different employee categories, depending on expertise, level of education or seniority. Hourly rates are used when pricing is based on the amount of time spent on manufacturing the goods or services, rather than the goods or services themselves.

**Model price:** The price of a hypothetical or historically sold good or service. Typically applied in cases where the good or service provided is unique. The approach specifies a standardised product, that is sufficiently representative of the type of good or service provided, and respondents are asked to recalculate a price quote in each period.

**Real transaction price:** The price of a good or service actually paid in the market. It represents the actual price paid, inclusive of any discounts, surcharges or rebates, for an individual transaction that can be observed repeatedly

**List price:** A price quoted from the producer's price list, catalogue, Internet site, etc. It is generally the gross price exclusive of all discounts, surcharges or rebates that may apply to an actual transaction.

## 2.5 Statistical unit

The statistical units in the *Producer Price Index for Services* are companies, where each company is determined by legal entity. In Statistics Denmark's Statistical Business Register, legal entities are determined by their VAT number.

In some cases, this principle is abandoned. Several companies can be combined into one unit, e.g. if they have centralized administration or in the case of franchises.

## 2.6 Statistical population

The *Producer Price Index for Services* consists of a number of industry indices. This means that the population includes all companies in the industry for which prices are collected. Each industry therefore has each individual population and sample.

## 2.7 Reference area

Denmark.

## 2.8 Time coverage

These statistics cover the time period from 2006 and onwards.

## 2.9 Base period

2015=100

## 2.10 Unit of measure

Index.

## 2.11 Reference period

The respondents report the prices, which were in force in the middle of the quarter or an average price for the entire quarter.

## 2.12 Frequency of dissemination

Quarterly.

## 2.13 Legal acts and other agreements

The legal authority to collect data is provided by the Act on Statistics Denmark, section 8, as subsequently amended (most recently by Act no. 610 of 30th May, 2018).

These statistics are covered by [Regulation \(EC\) No 1158/2005 of the European Parliament and of the Council](#) of 6 July 2005 amending Council Regulation (EC) No 1165/98 of 19 May 1998 concerning short-term statistics and [Regulation \(EC\) No 1893/2006 of the European Parliament and of the Council](#) of 20 December 2006.

## 2.14 Cost and burden

The response burden calculated at DKK 42,000.

## 2.15 Comment

For more information please contact Statistics Denmark at [Producentprisindeks for tjenester](#).

## 3 Statistical processing

Approx. 1.700 prices are collected quarterly from selected companies in Denmark in order to calculate these indices. Prices are collected through an electronic questionnaire. The prices are automatically validated during the collecting process and changes that are greater than a predetermined threshold value, are checked manually by the staff. The Price indices are calculated in a hierarchical system, where the first calculation is made for the most detailed industries, i.e. elementary indices. These elementary indices are calculated based on a number of *basic prices*, as geometric Jevons Indices. The elementary indices are subsequently weighted together as aggregated price indices. These are calculated as arithmetic Laspeyres indices.

### **3.1 Source data**

The *Producer Price Index for Services* is calculated on the basis of prices, reported by selected companies who offer various services.

### **3.2 Frequency of data collection**

Quarterly.

### **3.3 Data collection**

Prices are collected through an electronic reporting form, which is sent to relevant contacts within the selected companies.

### **3.4 Data validation**

The first validation of price data happens when prices arrive to Statistics Denmark. Here they are auto tested for unusual developments. The prices which development is greater than a predetermined threshold value, are checked manually by the staff and accepted only if the companies can verify the change. When all prices are received, the system generates a list that includes all price changes and a measure of how these affects the elementary aggregates. The final validation is a qualitative inspection of all calculated index tables.

### **3.5 Data compilation**

The *Producer Price Index for Services* are calculated in a hierarchical system, where the collected prices are initially divided into *CPA-groups* which are the most detailed groups of services. The CPA-groups are then aggregated into so-called elementary aggregates for which basic prices can be calculated as geometric Jevons Indices. Elementary indices are calculated on the basis of basic prices between two or more periods. The developments of the basic prices are therefore equal to the total price change for a given six-digit DBo7 industry.

The elementary indices are subsequently weighted together as aggregated price indices. These are calculated as arithmetic Laspeyres indices. It is calculated as a Laspeyres type index where the price and weight reference period does not coincide.

*Weights:* Weights are assigned to every elementary index and are used for weighting the elementary indices together to aggregated indices. The current weights are based on national accounts balances.

*Estimates for non-response:* Non-response is negligible. If it should happen for any significant goods, imputation techniques are used. In other cases the prices are regarded as unchanged.

### **3.6 Adjustment**

There are no corrections of data beyond what has already been described during data validation and data processing.

## 4 Relevance

The *Producer Price Index for Services* is a key business cycle indicator which is used to analyze socioeconomic developments. The price indices can be used by public and private decision makers e.g. for contract regulation. Furthermore, the indices are used as deflators in the Danish National Accounts for constant price calculations.

### 4.1 User Needs

The *Producer Price Index for Services* is a key business cycle indicator which is used to analyze the socioeconomic development. In the Danish national accounts statistics, the indices are used as deflators for constant prices calculations, i.e. calculation of the actual economic development in Denmark. Internationally, Eurostat uses the Danish *Producer Price Index for Services* to provide harmonized statistical information from the European Union member states.

### 4.2 User Satisfaction

The primary user of this statistic is the Danish National Accounts. For this reason, the statistics main objective is do act as a deflator for value calculations. This has implications with regards to the choice of the sample, as the ambition is to cover as much industry turnover as possible, rather than reflect typical price developments. There is an ongoing dialogue with the National Accounts, in terms of quality and user satisfaction.

There are also external decision makers who use the statistic for contractual regulations, as well as to monitor price developments in the published industries. There has been a demand for more detailed price indices for specific industries than is currently published in the Statbank. Statistics Denmark are currently investigating the possibilities for publishing more detailed industry indices.

Once a year Statistics Denmark holds a committee meeting with users of price indices. The meetings are held in cooperation with the *Consumer Price Index*, as well as the statistics for Purchasing Power Parities and price level indices. Members of the committee are; the Ministry of Finance, the Ministry of Economic Affairs and the interior, the Danish National Bank and the Danish Competition and Consumer Authority. Members of the committee may be changed if needed.

### 4.3 Data completeness rate

Some industry indices are not published due to confidentiality reasons or because they are under development. The statistic is covered by requirements from the EU in terms of industry coverage, level of detail, frequency and publication times. Statistics Denmark meets all these requirements. In addition, Statistics Denmark actively participate in exploratory work to expand the number of industries covered by the *Producer Price Index for Services*.

## 5 Accuracy and reliability

It is assumed that the price developments in the sample expresses the price development in the population. That is the price development for services that are sold by Danish producers for a given industry.

The sample is made up of approximately 1700 prices and distributed between a number of industries that is outlined by the European regulation. Due to the large differences between industries, each industry is treated individually with its own sample. The samples are selected top-down to achieve as high turnover coverage as possible for each industry. Price changes from the largest companies have a bigger impact on the indices than smaller companies due to weighting. Each company is asked to report their most representative services that contributes the most to their turnover.

The sample is not a simple random sample and therefore it is not possible to calculate a measure for the sample standard error, but overall the index is assessed to be of high quality. The quarterly non-response rate is less than one percent and is not considered a significant source of error.

Final indices are published and are not revised unless an error is observed.

### 5.1 Overall accuracy

The samples for each industry are selected top-down to achieve as high turnover coverage as possible. The largest companies represent themselves, and smaller companies represent a group. In practice this means that price developments collected from larger companies carry more weight than price developments collected from smaller companies. It is assumed that the price developments in the samples expresses the price developments in the whole population.

The weights are based on the National accounts balances for 2017, which is based on multiple in-house primary sources (Purchases and sales by enterprises, Production and turnover in manufacturing industries. Retail Trade and International Trade etc.). This covers most of all the trade in Denmark and the weights are assessed to be representative of the Danish economy.

### 5.2 Sampling error

The samples for each industry are selected top-down to achieve as high turnover coverage as possible. The samples are thus not based on the probability of sampling selection corresponding to the importance of each service. To match the turnover balances in the National Accounts, prices are strictly collected from companies within the specific six-digit industries. This means that prices are collected, with no regards to comparability across the given industry, as long as the company is allocated in that specific industry in the Statistical Business Register. This criteria is complied with as far as possible, meaning that the elementary indices reflect the price developments of the companies within the industries, rather than reflecting the price development of a specific *type* of service. There may in this respect arise sampling errors if a company is misallocated in the Statistical Business Register.

The sample is therefore not a random sample and it is not possible to estimate the overall size of the sampling error.

### **5.3 Non-sampling error**

In spring 2020 Denmark closed down due to COVID-19. In the following opening of Denmark it has been possible to collect prices for The Producer Price Index for Services for all industries except 51.1 Passenger air transport for the second quarter of 2020. The industry index have been imputed with the index change from the same quarter last year. Non-response from the remaining industries is mainly unchanged compared to the same periods last year. Therefore, it is assessed that the industry indices does not have an increased amount of uncertainty due to COVID-19.

The weights are based on the National Accounts for the year 2017 and are updated every year. The current weights were implemented between Q4 2020 and Q1 2021. There is thus a constant lag in the weights used of at least four years.

As time passes, the services in the sample gets replaced. Because the new services often have different quality than the services that they replace, there is continuous quality adjustment of the index. When replacing services, new services are not included in the index before their prices are observed in two subsequent periods. A bias can arise in cases where price changes coincide with changes in quality. Methods for dealing with quality changes are described in Eurostat's methodology guide for developing Producer Price Index for Services.

There may be a tendency for old services to linger to long in the sample, and that new service are incorporated to late. Corporations are asked continuously to go through their reported services and asses whether they are still representative of their sales. If they are not then corporation is asked to replace the services in question.

Errors may occur when an enterprise reports incorrect prices. The reason for this is normally misunderstandings, e.g. change in staff. Furthermore, errors may occur when questionnaires are recorded at Statistics Denmark. Such errors are normally spotted by our error checking procedures. Recording errors are not regarded to be important.

The quarterly non-response is less than 1 percent and is not considered a significant source of error. If there is non-response for significant services the prices are imputed, otherwise the prices are considered unchanged.

Index calculations are automatized and done in a dedicated price index calculation system. Therefore it is assessed that the possibility of processing errors are insignificant.

### **5.4 Quality management**

Statistics Denmark follows the recommendations on organisation and management of quality given in the Code of Practice for European Statistics (CoP) and the implementation guidelines given in the Quality Assurance Framework of the European Statistical System (QAF). A Working Group on Quality and a central quality assurance function have been established to continuously carry through control of products and processes.

### **5.5 Quality assurance**

Statistics Denmark follows the principles in the Code of Practice for European Statistics (CoP) and uses the Quality Assurance Framework of the European Statistical System (QAF) for the implementation of the principles. This involves continuous decentralized and central control of products and processes based on documentation following international standards. The central quality assurance function reports to the Working Group on Quality. Reports include suggestions for improvement that are assessed, decided and subsequently implemented.

## 5.6 Quality assessment

Overall the indices of the *Producer Price Index of Services* is assessed to be of high quality and representative for the price development for the given services sold by Danish producers. This assessment relies on the data used for the index, which consists of 1700 prices distributed on approximately 60 industry codes. Within each industry, the largest companies are selected based on the company turnover (top-down) to achieve as high turnover coverage as possible for each industry. Together with the weights encompassing the main part of all Danish trade as well as the continuously monitoring of the quality of the sample.

There are large differences between the industries which the *Producer Price Index for Services* covers. There is great variation in the number of companies from industry to industry. In some industries it is possible to cover a large amount of turnover with a small sample, whereas in others, it is difficult to cover a small amount of turnover even with a large sample. Hence it is not possible to determine a common quality benchmark across all industries, and the quality will vary more for more disaggregate indices.

A comprehensive quality assessment is therefore based on a combination of assessing turnover coverage, the number of companies and prices in the sample and the quality of the collected prices, including the pricing methods used. The quality of the statistic is being continually monitored and improvements are made where it is assessed that the quality can be levered. Conducting quality work therefore includes making replacements within- and increasing the sample with more respondents. Asking existing respondents to report more prices, or use better pricing methods to define and calculate prices.

Furthermore, the quality of this statistic can be assessed by to what extent the statistic is relevant, accurate and reliable, timely and punctual, comparable and accessible to the users. You can read how the index lives up to these goals in the sections with the corresponding headlines.

## 5.7 Data revision - policy

Statistics Denmark revises published figures in accordance with the [Revision Policy for Statistics Denmark](#). The common procedures and principles of the Revision Policy are for some statistics supplemented by a specific revision practice.

## 5.8 Data revision practice

Only final figures are published and are not revised unless an error is observed..

## 6 Timeliness and punctuality

These statistics are published quarterly, approx. 1,5 months after the end of the reference period, as far as possible on the 15th of the month or the first business day thereafter. Publications are released on time, as stated in the release calendar.

### 6.1 Timeliness and time lag - final results

The statistics are published every quarter. A given quarter is published approx. 1,5 months after a quarter as far as possible on the 15th of the month or the first business day thereafter.

## 6.2 Punctuality

The statistics are usually published without delay in relation to the scheduled date.

## 7 Comparability

The *Producer Price Index for Services* can be found as a time series from 2006 to present. The statistic follows international standards and is therefore comparable with similar statistics from other European countries.

### 7.1 Comparability - geographical

All EU member states are required to produce *Producer Price Indices for Services* under the guidelines of Council Regulation (EC) no. 1158/2005 of 6 July 2005 amending Council Regulation (EC) no. 1165/98 concerning short-term statistics and Council Regulation (EC) no. 1893/2006 of 20 December 2006. The statistics can be compared internationally on the website of Eurostat. Also, outside the European community, *Producer Price Indices for Services* are produced for selected industries. In addition, there is an international forum called [Voorburg Group on Service Statistics](#).

### 7.2 Comparability over time

The statistic has been produced in its current form since 2006.

### 7.3 Coherence - cross domain

The *Producer Price Index for Services* is related to the *Producer- and import Price Index for Commodities*.

### 7.4 Coherence - internal

The total for Producer price index for services is not calculated. The statistic is composed by selected industries, due to demand from Eurostat, for which there is gathered prices and calculated indices. Therefore, the calculation of a total price index for services would not reflect the total price development of services in the Danish economy on this basis.

The statistic is utilized by the Danish National Accounts for the calculation of real prices. The National Accounts use a variation of the published industry code (DB07) and matches the price indices to their variation of the industry code. The published price indices utilizes the industry grouping in the current legislation from the EU.

## 8 Accessibility and clarity

These statistics can be found in the StatBank, under the subject [Producer Price Index for Services](#). For further information, go to the [subject page](#).

### 8.1 Release calendar

The publication date appears in the release calendar. The date is confirmed in the weeks before.

## **8.2 Release calendar access**

The Release Calendar can be accessed on our English website: [Release Calendar](#).

## **8.3 User access**

Statistics are always published at 8:00 a.m. at the day announced in the release calendar. No one outside of Statistics Denmark can access the statistics before they are published.

## **8.4 News release**

Not relevant for these statistics.

## **8.5 Publications**

The statistic is not published in other publications from Statistics Denmark.

## **8.6 On-line database**

The statistics are published in the StatBank under [Producer price index for services](#) in the following tables:

- [PRIS1515](#): Producer price Index for Services by industry

## **8.7 Micro-data access**

There is not access to Micro-data for these statistics.

## **8.8 Other**

Indices are transmitted to Eurostat according to the specified groupings of NACE Rev. 2 activities in Regulation (EC) No 1893/2006 of 20 December 2006, Annex D for output price variable No 310.

## **8.9 Confidentiality - policy**

[Data Confidentiality Policy](#) at Statistics Denmark.

## **8.10 Confidentiality - data treatment**

All data are handled confidential. The Statute of Statistics Denmark and a letter explaining terms and conditions, including the confidentiality of individual responses, are sent out to all respondents in the survey. No figures are published for which individual companies can be identified, unless there are public figures available. Price indices for the following industries are not published due to confidentiality:

- 50 Water transport services
- 51 Air transport services
- 52.22.00 Service activities incidental to water transportation
- 52.23.00 Service activities incidental to air transportation
- 53.10.00 Postal services under the Universal Service Obligation
- 61 Telecommunication
- 68.31.10 Real estate agencies

## **8.11 Documentation on methodology**

These statistics are compiled in compliance with the [Eurostat-OECD Methodological Guide for Developing Producer Price Indices for Services](#).

## **8.12 Quality documentation**

Results from the quality evaluation of products and selected processes are available in detail for each statistics and in summary reports for the Working Group on Quality.

## **9 Contact**

The administrative placement of these statistics are in the division of Prices and Consumption. The person responsible is Nicklas Elversøe, tel. +45 39 17 31 42, e-mail nel@dst.dk

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