

**Documentation of statistics for
Producer Price Index for Services 2015**

1 Introduction

The purpose of the *Producer Price Index for Services* 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), exclusive of VAT. Quarterly price indices have been calculated by Statistics Denmark since 2006.

2 Statistical presentation

The *Producer Price Index for Services* is calculated on prices of Danish produced services, relating to the first commercial transaction (business to business), for the domestic market and export.

2.1 Data description

The purpose of the *Producer Price Index for Services* 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), exclusive of VAT.

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

These groupings are also used for dissemination of *Producer Price Indices for Services* in the Statbank and on the website of Statistics Denmark.

2.3 Sector coverage

The statistic covers a wide range of service industries in Denmark - from transportation services, on to legal services, to cleaning services. The statistic covers many different types of services, including prices on; courier services from A to B, an hour's legal assistance, and cleaning of office space. Prices on services are collected from the following (DBO7) industries:

H Transportation and storage services

- 49 Land transport services
- 50 Water transport services (confidential)
- 51 Air transport services (confidential)
- 52 Warehousing and support services for transportation (under development)
- 53 Postal and courier services

J Information and communication services

- 61 Telecommunications (under development)
- 62 Computer programming, consultancy and related services
- 63 Information Services

L Real estate services

- 68 Real estate services (under development)

M Professional, scientific and technical services

- 69 Legal and accounting services
- 70 Management consulting services
- 71 Architectural and engineering services
- 73 Advertising and market research

N Administrative and support services

- 78 Employment services
- 80 Security and investigation services
- 81 Services to buildings and landscape

A detail how the list of the industries covered by the *producer price index for services* can be found in Annex industries.

2.4 Statistical concepts and definitions

Unit value: Actual selling price is calculated by dividing quarterly revenue for a given service, by number of units sold.

Contract pricing: Actual selling price in long term contracts for repeated delivery, to the same customer.

Hourly rate: Hourly list prices for various categories of staff or services, depending on expertise, level of education or seniority.

Model price: A hypothetical or historically sold service. The price is recalculated every quarter by adjusting the factors in the price calculation.

Percentage fee: Actual price of services, as a percentage of a contract, an asset or other products.

Realized hourly rate: Actual hourly prices are calculated by dividing quarterly revenue for a given service, by the number of hours an employee has spent on this during that quarter.

Direct use of prices of repeated services: Actual selling price of relatively uniform services, sold regularly to different customers.

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

The *Producer Price Index for Services* has been produced and published since 2006.

2.9 Base period

2010=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. 599 of 22nd June, 2000).

Council Regulation (EC) No 1158/2005 of 6 July 2005 amending Council Regulation (EC) No 1165/98 of 19 May 1998 concerning short-term statistics and Council Regulation (EC) No 1893/2006 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. 1,500 prices are collected quarterly from selected companies in Denmark in order to calculate the *Producer Price Index for Services*. Prices are collected through an electronic reporting form.

The *Producer Price Index for Services* 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.

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 the 2010 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.

Estimates for grossing-up: There is no grossing up.

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.

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 national accounts statistic 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 to 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

Approx. 1.500 prices are collected from approx. 50 six-digit industries. 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. The largest companies represent themselves, and smaller companies represent a group. Therefore it is not possible to estimate the size of the sampling error. It is assumed that the price developments in the sample express the price development in the population. The quarterly non-response rate is less than one percent and is therefore not considered to be a significant source of error.

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. Since the focus is on covering as much turnover as possible, rather than reflecting typical price developments as in the *Consumer Price Index*, the indices may as deflators move in slightly different directions than pure price indices.

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

Inaccuracy in weights: The weights are based on the National Accounts for the year 2010 and are updated every five years. The current weights were implemented between Q4 2013 and Q1 2014. There is thus a constant lag in the weights used of at least three years.

Quality change bias: 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.

Response errors: Errors may occur when an enterprise reports incorrect prices. The reason for this is normally misunderstandings, e.g. change in staff.

Recording errors: 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.

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

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.

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.

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.

6 Timeliness and punctuality

The statistics are published every quarter. A given quarter is published approx. 2,5 months after a quarter as far as possible on the 15th of the month or the first business day thereafter. The statistics are usually published without delay in relation to the scheduled date.

6.1 Timeliness and time lag - final results

The statistics are published every quarter. A given quarter is published approx. 2,5 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 complete 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

Not relevant for these statistics.

8 Accessibility and clarity

Nyt fra Danmarks Statistik (News from Statistics Denmark) and www.Statbank.dk

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

Nyt fra Danmarks Statistik [Producentprisindeks for tjenester](#).

8.5 Publications

None.

8.6 On-line database

Publishing: [Producer price index for services](#).

8.7 Micro-data access

Questionnaires are stored for the current year and for the previous two years.

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

The compilation of the Producer Price Index for Services follows the [Data confidentiality policy](#) of Statistics Denmark. In practice this means that there is no published figures which individual companies can be identified, unless there are public figures available.

8.10 Confidentiality - data treatment

Confidentiality - Policy: The compilation of the Producer price index for services resulting from Statistics Denmark [Data confidentiality policy](#). In practice this means that there is no published figures which individual companies can be identified, unless there are public figures available.

Confidentiality – Data Treatment: The Statute of Statistics Denmark and a letter explaining terms and conditions, including the confidentiality of individual responses, are sent out to all enterprises participating in the survey.

Treatment of confidential data: Confidential data are treated by suppression.

8.11 Documentation on methodology

No documentation is available.

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 Rasmus Anker Kristiansen, tel. +45 39 17 35 32, e-mail rkr@dst.dk

9.1 Contact organisation

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