STATISTICS DENMARK

Documentation of statistics for Construction Cost Indices for Civil Engineering Projects 2022

Statistics Denmark
Sejrøgade 11
DK 2100 København Ø

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1 Introduction

The cost index for civil engineering projects show the trends in prices for construction work in Denmark. It is used, among other things, for regulation of building contracts.

2 Statistical presentation

The cost index for civil engineering projects shows trends in prices for work performed by different contractors in civil engineering projects: Earthwork, asphalt work, concrete structures, iron structures and sub-indices for traffic performance by lorries and materials and machinery. Trends in costs for construction of roads are also monitored based on a weighting of indices for earthwork, asphalt work and concrete structures.

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2.1 Data description

The index is a quarterly statistic on those costs associated with civil engineering works. It is computed on earthworks, resurfacing work, concrete structures, iron- and steelwork structures as well as subindices for motor lorries and equipment and machinery. Moreover, an index for construction costs of roads is computed based on a weighting of indices for earthworks, resurfacing works, concrete structures and an operational index computed from oil fuel and subindices for motor lorries and equipment and machinery as well as labour costs.

The overall costs for civil engineering projects covers the costs associated with the construction of the road network in Denmark. The cost index is a weighted index, which means that the index is calculated as a weighted average of the change in prices for materials and labour.

The index is calculated as a chained fixed weights Laspeyres index, and shows the quarterly change in costs of a fixed basket of commodities, which in the case of the cost index for civil engineering projects encompasses those materials and labour input of civil engineering works.

The basis for the weights for this statistics are developed i cooperation with the Danish Road Directorate, DSB and the Danish Construction Federation based on an analysis of a ongoing and completed civil engineering project. Approximately every fifth year, the weights are evaluated. The basis for the weights was last updated as of the 1st quarter 2016, where both the weight- and basisreference period was changed to 2015. Construction cost indices for road work has been published since the first quarter 1995, when it replaced the index for motor highways and main roads. From January 1st 2001 the title was altered: Construction cost indices for road work to the cost index for civil engineering.

The cost index for civil engineering illuminates exclusively the development of costs associated with civil engineering works, and, therefore, does not state anything about the actual level of the costs.

All indices are published both excl. and incl. unemployment benefits.

Until April 2004 the price concept was the actual producer or import prices excl. VAT. Actual prices means that both general discounts and actual discounts are offset in the price.

Since April 2004 the import prices have been collected as purchasing prices and not sales prices as previously. Hereinafter, the price concept for imported goods are actual purchasing prices c.i.f. excl. all taxes and duties.

Weighting scheme for the cost index for road construction: The weighting scheme for the cost index for road construction is set up in cooperation with the Danish Road Directorate on the basis of an analysis of a range of finished road constructions. The indices for earth works, asphalt works and concrete structures are used directly in the calculation of the cost index for road construction . The three indices have weights of 38 pct. for earth works, 41,5 pct. for asphalt works and 20,5 pct. for concrete structures.

2.2 Classification system

The index is based on subgroups for earth work, asphalt work, concrete structures, iron structures, as well as subindices for traffic performance by lorries, and material and equipment. Moreover, an operating index and an index for construction of roads is published, the latter of which is composed of earth work, asphalt work and concrete structures.

2.3 Sector coverage

Civil engineering sector.

2.4 Statistical concepts and definitions

Labor costs: The labor costs are calculated on the basis of the convention salary agreed upon by the Danish Construction Association and 3F (United Federation of Danish Workers) incl. social contributions. All indices are published both excl. and incl. unemployment benefits.

Material prices: The material prices are calculated on the basis of information gathered for the price index for domestic supply along with prices for traffic performance by lorries.

Until April 2004 the price concept was the actual producer or import prices excl. VAT. Actual prices means that both general discounts and actual discounts are offset in the price.

Since April 2004 the import prices have been collected as purchasing prices and not sales prices as previously. Hereinafter, the price concept for imported goods are actual purchasing prices c.i.f. excl. all taxes and duties.

Weighting scheme for the cost index for road construction: The weighting scheme for the cost index for road construction is set up in cooperation with the Danish Road Directorate on the basis of an analysis of a range of finished road constructions. The indices for earth works, asphalt works and concrete structures are used directly in the calculation of the cost index for road construction . The three indices have weights of 38 pct. for earth works, 41,5 pct. for asphalt works and 20,5 pct. for concrete structures.

The weighting schemes for earth works, asphalt works, concrete structures and iron structures set up on the basis of analysis on finished an ongoing civil engineering projects after discussing the matter with the Danish Road Directorate, Danish Railways and the Danish Construction Association.

For all indices there are sub-indices for labor costs and a number of main cost components. These are not published but can be retrieved by contacting statistics Denmark.

Sub-indices for traffic performance by lorries includes costs such as acquisition costs, interests, vehicle excise duties, insurance, drivers' salaries, administrative costs, fuel, tires and repairs. freight costs.

2.5 Statistical unit

Costs.

2.6 Statistical population

The population encompass prices on the material and labour costs required for civil engineering projects.

2.7 Reference area

Denmark.

2.8 Time coverage

1986-

2.9 Base period

2015=100

2.10 Unit of measure

Index numbers and percentage changes.

2.11 Reference period

Construction cost indices for civil engineering projects are compiled quarterly, i.e. the relevant index number is representative for costs in the relevant quarter.

2.12 Frequency of dissemination

Quarterly.

2.13 Legal acts and other agreements

Act concerning Statistics Denmark § 8, as subsequently amended (most recently by Act no. 599 of 22 June, 2000). Council Regulation (EC) No 1165/98 of 19th May 1998 about business cycle statistics and the Commission Regulation (EC) No 588/2001.

2.14 Cost and burden

There is a miniscule direct response burden since most of the data are obtained from other statistics produced by Statistics Denmark.

2.15 Comment

Further information on the cost index for civil engineering projects is available at the statistics" subject page or by contacting Statistics Denmark, Prices and Consumption.

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3 Statistical processing

The indices are calculated on the basis of information from the Price index for domestic supply, the Producer price index for services (regarding freight transport by road), as well as wage rate agreements between the Danish Association of Builders (Dansk Byggeri) and the United Federation of Workers in Denmark (3F).

For all indices, sub-indices for labor costs and main cost groups are calculated. These sub-indices are weighed together to form the main indices. The weights reflect the shares of labor costs, material costs and equipment costs of the total costs of performing civil-engineering projects.

3.1 Source data

The indices are calculated on the basis of information from the Price index for domestic supply, the Producer price index for services (regarding freight transport by road), as well as wage rate agreements between the Danish Association of Builders (Dansk Byggeri) and the United Federation of Workers in Denmark (3F).

3.2 Frequency of data collection

Primarily monthly and quarterly. Some costs are gathered yearly, or in connecting with newly negotiated working agreements

3.3 Data collection

For the construction cost index for civil engineering projects data that has already been gathered by other in Statistics Denmark is used. Furthermore, some prices are collected from the internet. Wage rates are gathered from agreements between the Danish Association of Builders (Dansk Byggeri) and the United Federation of Workers in Denmark (3F).

3.4 Data validation

Basic data is validated before use in Construction cost index for civil engineering projects. Price developments are tested for unusual and/or extreme changes. If such changes exceed established limit values they are manually examined and reporting companies are asked to explain these changes.

3.5 Data compilation

The cost index for civil engineering projects is calculated following a hierarchical system where the collected prices are distributed into a number of product groups. These product groups are aggregated to "basic aggregate groups", which are used to calculate "basic prices". The developments between basic prices in subsequent time periods are used to calculate "basic indices", which is the most detailed index level. The basic indices are then used to calculate aggregated subindices using the Laspeyres type index formula. Finally, sub-indices are used to calculate the main indices, which is the highest level in the index hierarchy.

Main cost indices include Roads, Earth work, Asphalt work, Concrete structures, Iron structures, and Operating index. Sub-indices for Materials and machinery, and Traffic performance by lorries are also compiled.

For all indices, sub-indices for labor costs and a number of main cost groups are calculated. These sub-indices are weighed together to form the main indices. The weights reflect the shares of labor costs, material costs and equipment costs of the total costs of performing civil-engineering projects.

The process of calculations from collected prices to main indices is done based on so-called classification codes and weight basis for the different types of civil engineering projects. The weight reference period for the main indices Earth work, Asphalt work, Concrete structures, and Iron structures were calculated based on analyses of a number of civil engineering projects, and established in 1976 in collaboration with The Danish Road Directorate, DSB and The Danish Construction Federation. The weight reference period for the main index for Roads is established in 1995 in collaboration with The Danish Road Directorate, and is also based on a analysis of a number of civil engineering projects.

3.6 Adjustment

No corrections are made besides from what has already been described under data validation and data treatment.

4 Relevance

The purpose of the Construction cost indices for civil engineering projects is to reflect the development in the costs of civil-engineering projects. It is mainly used for regulation of building contracts. The indices are utilized primarily by construction organizations, contractors, building owners, craftsmen, lawyers and public authorities.

4.1 User Needs

The construction cost index for civil engineering projects has two primary purposes. The index is used for contract regulation and to follow the economic development in construction costs. The users of the construction cost index for civil engineering projects are construction organizations, contractors, building owners, craftsmen, lawyers and public authorities.

4.2 User Satisfaction

No information on user satisfaction is collected.

4.3 Data completeness rate

Not relevant for these statistics.

5 Accuracy and reliability

The weighting of the indices for earthwork, asphalt work, concrete structures, iron and steel structures is prepared on the basis of an analysis of completed and ongoing construction work. In agreement with the Danish Roads Directorate, State Railways and the Danish Association of Builders the weighting is finally determined. The weighting for the construction cost index for roads is prepared in collaboration with the Danish Roads Directorate on the basis of an analysis of various completed motorway and highway projects.

5.1 Overall accuracy

The Construction cost indices are be considered to be of high quality and representative for the general trends in costs of civil engineering projects in Denmark. The quality of both data and weighing is continuously monitored are improved.

The statistics are primarily compiled on the basis of data from the price index for domestic supply and wage rates fixed by collective agreements between the Danish Association of Builders and the United Federation of Workers in Denmark (3F, previously the Danish Specialized Workers' Union). Figures on the statistical reliability are not estimated.

A possible source of errors is response errors or registrations errors during the data collection. The types of errors are for the most part avoided through thorough trouble shooting and data validation.

See also the documentation of statistics for the Price index for domestic supply.

5.2 Sampling error

Sample uncertainties are not calculated as data sources are not randomly selected.

The price index for domestic supply, from which most of the prices used in Construction cost indices for civil engineering projects are gathered, uses a top-down principle by which a minimum of 70 pct. of the Danish production and import is covered. The used samples are therefore considered to be representative of actual price developments.

5.3 Non-sampling error

Response errors: Errors may occur when an enterprise report prices for other commodities than expected. The reason for this is normally misunderstandings e.g. change in staff.

Recording errors: Errors may occur when questionnaires are recorded in Statistics Denmark. Our error checking procedures normally spot such errors. 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

Overall the Construction cost indices for civil engineering project is assessed to be of high quality and representative for the general trends in costs of civil engineering projects in Denmark. Weight bases are reevaluated approximately every five years to assess the representativeness of the indices to actual civil engineering projects.

The indices are calculated in a dedicated, computerized price index system to prevent manual errors. Errors may occur during the price reporting process, either from involved data sources or by Statistics Denmark, but this is accommodated by continuous monitoring of 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 compiled. Revisions are not performed, unless errors are found in already published numbers.

6 Timeliness and punctuality

The statistics are published quarterly at the beginning of February, May, August and November. The statistics are usually published without delay in relation to the scheduled date. Construction cost indices for civil engineering projects are compiled quarterly at the end of March, June, September and December.

6.1 Timeliness and time lag - final results

Quarterly statistics are published in the beginning of March, June, September and December, respectively. Yearly statistics are published in the beginning of March.

6.2 Punctuality

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

7 Comparability

The construction cost index for civil engineering projects was calculated for the first time in 1959.

The indices have since then changes both weights and calculation method several times, thus they are not directly comparable over time when going back to 1959.

The Norwegian statistical agency are producing a cost index for road construction which is comparable to the Danish indices.

7.1 Comparability - geographical

The Norwegian statistical agency has since 1985 produced cost indices for road construction. The indices are based on input prices and measure the development of the factor prices in road construction. The price changes of material, labor, equipment and transportation are weighted together to form total indices. I.e. the Norwegian indices are calculated using the same method as for the Danish indices. Thus, the total indices calculated in the two countries are comparable.

7.2 Comparability over time

The first cost index for road fund work was compiled for March 1959 and the index for motorway work was compiled for the first time for March 1967 with March 1965 equal to 100.

In March 1971 when Statistics Denmark began to publish the road indices, the weighting of the indices was adjusted. Simultaneously, the year 1968 = 100.

The calculation of labour costs in the road indices was originally based on actual labour costs. In 1976 Statistics Denmark began to calculate construction cost indices using the collective wage rate agreements. The same year the weight basis for main indices Earth work, Asphalt work, Concrete structures, and Iron structures was established and published.

The cost index for roads was published for the first time in June 1996. The aim of the new index was to simplify the index-calculation, as the new index is in future to replace the two indices for motorways and highways. Part of this process of simplification is that the construction cost indices for earthwork, asphalt work and concrete structures are used directly in compiling the new index.

From 1 January 2001 are the titles: Construction cost indices for road work changed to Construction cost indices.

As of quarter 1 of 2016 the base year has been changed so that 2015 = 100.

7.3 Coherence - cross domain

Prices for materials and equipment are mainly collected from the Price Index for Domestic Supply. These indices are not directly comparable to the sub-indices of the construction cost index. This is caused by the fact that these sub-indices are calculated on basis of detailed indices that are not published in the Price Index for Domestic Supply.

7.4 Coherence - internal

Not relevant for these statistics.

8 Accessibility and clarity

The statistics appear in News from Statistics Denmark, in Prices and consumption, in Main Indicators.

Annual publications: Statistical Yearbook and Statistical Ten-Year Review.

- Quarterly - BYG61
- Yearly - BYG71
- Subject pages

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 Calender can be accessed on our English website: Release Calender.

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

Scheduled release may be found at Scheduled releases

8.5 Publications

Statistical Yearbook.

8.6 On-line database

The statistics are published in the StatBank under the subject Construction cost index for civil engineering projects in the following tables:

- BYG61: Construction cost indices for civil engineering projects by index type, unit and time
- BYG71: Construction cost indices for civil engineering projects by index type, unit and time

8.7 Micro-data access

The primary data are stored in registers. Special processing and linkages of the data are not possible.

8.8 Other

Not relevant for these statistics.

8.9 Confidentiality - policy

All statistics in Statistics Denmark follow the data confidentiality protocol of Statistics Denmark. For the Construction cost indices for civil engineering projects only aggregated indices are published, thus discretion does not apply to this statistic.

8.10 Confidentiality - data treatment

All statistics in Statistics Denmark follow the data confidentiality protocol of Statistics Denmark. For the Construction Cost index for civil engineering projects only aggregated indices are published, thus discretion does not apply to this statistic.

8.11 Documentation on methodology

Not available in English. A Danish version may be found at Indeksberegninger i Danmarks Statistik.

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 this statistic is in the division of Prices and Consumption. The person responsible is Peter Fink-Jensen, tlf. 39 17 31 88, e-mail: pfj@dst.dk

9.1 Contact organisation

Statistics Denmark

9.2 Contact organisation unit

Prices and Consumption, Economic Statistics

9.3 Contact name

Peter Fink-Jensen

9.4 Contact person function

Responsible for the statistics

9.5 Contact mail address

Sejrøgade 11, 2100 Copenhagen

9.6 Contact email address

pfj@dst.dk

9.7 Contact phone number

+45 39 17 31 88

9.8 Contact fax number

N/A