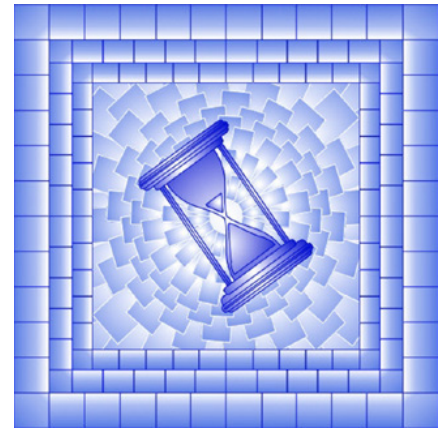


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Technical Guide for the Consulting Services Price Index (COSPI)



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Technical Guide for the Consulting Services Price Index (COSPI)

1 Introduction

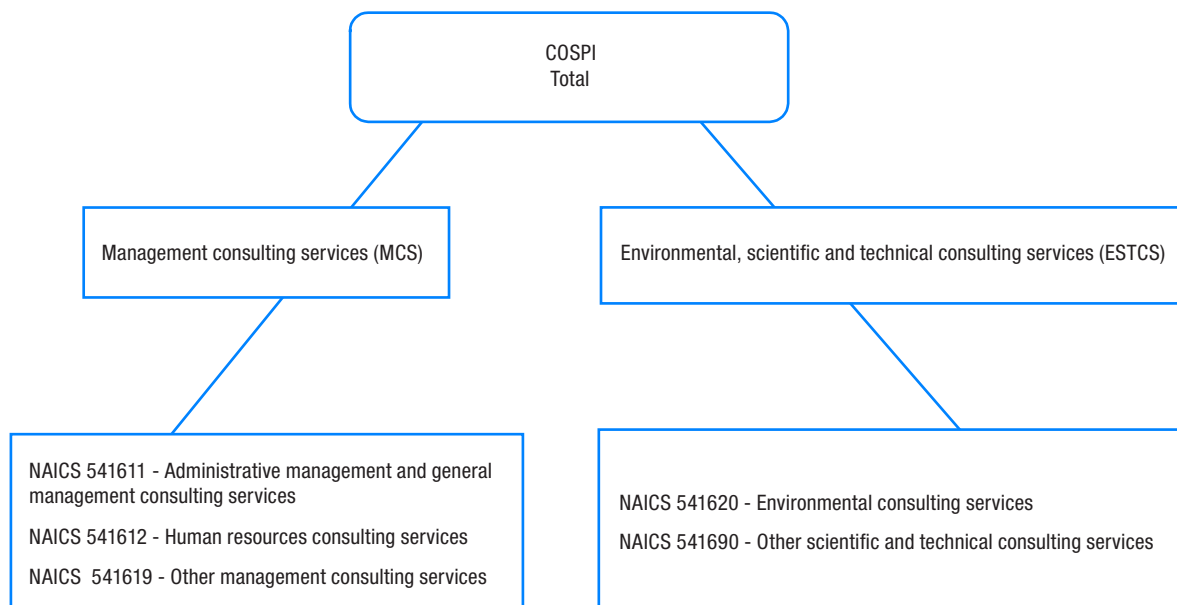
The Consulting Services Price Index (COSPI) measures the quarterly change in prices of various types of management, environmental, scientific and technical consulting services in Canada, and is classified under the Management, scientific and technical consulting services industry, North American Industry Classification System (NAICS) [5416](#). The COSPI is an indicator of economic activity within the consulting services industry, as well as a tool for performance evaluation, cost monitoring, contract assessment and benchmark comparisons. It is also used by the Canadian System of Macroeconomic Accounts to arrive at estimates of real value added for the industry and to measure changes in productivity.

For the purpose of the COSPI, services are classified into one of five industries:

- [NAICS 541611](#): Administrative management and general management consulting services
- [NAICS 541612](#): Human resources consulting services
- [NAICS 541619](#): Other management consulting services
- [NAICS 541620](#): Environmental consulting services
- [NAICS 541690](#): Other scientific and technical consulting services

The COSPI is an aggregation of these five service industries. An aggregation for Management Consulting Services (MCS) is first created by pooling data for [NAICS 541611](#), [NAICS 541612](#) and [NAICS 541619](#) (for each establishment separately). A second aggregation for Environmental, Scientific and Technical Consulting Services (ESTCS) is created by pooling data for [NAICS 541620](#) and [NAICS 541690](#). Data for each industry are collected quarterly, using a questionnaire.

Figure 1
Overview of Aggregation Structure for the COSPI



Data collection for the COSPI occurs over a six-week period starting in the quarter immediately following the reference period and is published the month following the end of data collection.¹

Indexes are published at the national level for MCS, ESTCS, and for the overall aggregated COSPI.

Appendix A defines key concepts used for constructing the COSPI.

2 Data Sources

2.1 Sampling process

Cut-off sampling and judgement sampling methods were used to create the sampling frame for MCS. The cut-off sampling selection was obtained from the list of companies on Statistics Canada's Business Register² (BR) that are classified to [NAICS 541611](#), [NAICS 541612](#) and [NAICS 541619](#) (see section 1). The judgement sample was obtained from an inventory of management consulting companies provided to Statistics Canada by the Canadian Association of Management Consultants (CMC-Canada). Companies were also selected from the Dow Jones Factiva database of companies according to their relevance in the Canadian management consulting services industry. The judgment sample helps to identify companies who participate in the management consulting industry but whose primary activity may be in a different NAICS. This sampling method was used to allow some of the largest firms from the management consulting industry that were not coded under the MCS NAICS to be added to the sampling frame.

The sampling frame for ESTCS consists of all companies on Statistics Canada's BR that are classified to [NAICS 541620](#) and [NAICS 541690](#) (see section 1). The probability of selection is based on the Sequential Poisson Probability Proportional to Size³ sampling methodology. The sample was last updated in 2019.

2.2 Prices

Data for the COSPI are collected from a quarterly survey of companies engaged in consulting services according to the industry they belong to at the time of sampling. Respondents are asked if the establishment engaged in consulting services classified under its recorded industry within the two years prior to the end of the collection period.

Respondents are asked to report prices for professional levels that are representative of the industry they are classified to. The professional levels should provide approximately the same service over time, as the objective of the COSPI is to measure the change in price longitudinally.

The data collected include the number of billable hours and average billable rates charged each quarter for each professional level working in the industry surveyed. Billable hours refer to time worked on business projects or contracts that will be charged to a client according to a contractual or pre-determined rate. Billable hours are those normally included in customer invoices and refer to pure project work. The average hourly (billing) rate is equal to the total (gross) dollar amount billed to clients in the quarter divided by the total number of billable hours that were charged to clients over the same period.

The data collected from companies are reviewed for consistency and completeness, and records may be edited or excluded from index calculation depending on the quality of the data provided.

2.3 Revisions

With each data release, data for the previous quarter may have been revised. These revisions occur when late data is collected for a previously non-responding establishment. Data for the preceding calendar year are subject to revision with the release of the second quarter data of the following reference year.

1. For the COSPI, collection for the first quarter (Q1) will start in the second quarter (Q2), and will run over a six-week period. This cycle continues for each subsequent quarter. Note that Q1 = January, February and March.

2. The Business Register (BR) is Statistics Canada's continuously-maintained central repository of baseline information on businesses and institutions operating in Canada.

3. The probability of selection for unit i is given by $\pi_i = \frac{nx_i}{\sum_{i=1}^N x_i}$ where the sampling frame consists of N units, n is the desired sample size and x_i is the revenue of unit i .

2.4 Weights

The weights used for the COSPI are obtained from revenue data stored on the Statistics Canada's BR. As stated in the introduction, the total COSPI is an aggregation of five service industries that have been grouped to form two service industries – MCS and ESTCS.

MCS and ESTCS are aggregated using the sum of revenues for each company under each service industry. The share of total revenue by each industry in the sample is assumed to be representative of the true share for each industry under [NAICS 5416](#).

3 Index Estimation and Aggregation

3.1 Introduction

The COSPI is based on a fixed sample, where a basket of services is established and changes in prices for these services are measured over time. The COSPI is calculated for the current period and compared to the previous period to measure price change. Estimates are produced by calculating a weighted average of price relatives by industry, which are chained⁴ together to form an index series. The COSPI is a fixed based Laspeyres price index using a chain approach. The COSPI is available at the national level.

3.2 Calculation of elementary aggregates

At the first stage of aggregation, the price relatives are aggregated using a weighted geometric average of the professional levels in each company to form a price index for each company. For the COSPI, the elementary aggregate is at the professional level within each company. These initial level aggregations are referred to as elementary price indices.

$$EA_{ij}^t = \prod_{k=1}^n \left(\frac{p_{ijk}^t}{p_{ijk}^{t-1}} \right)^{w_{ijk}}$$

EA_{ij}^t : The elementary aggregate of company i in industry j at time t .

p_{ijk}^t : The price of professional level k for company i in industry j at time t .

w_{ijk} : The weight of professional level k for company i in industry j .

3.3 Compilation of upper level aggregated indexes

The elementary price indexes are aggregated across companies within each industry using a weighted arithmetic index. For the COSPI, the Laspeyres index formula is used.

The index for industry j is given by:

$$I_j^t = I_j^{t-1} \sum_{i=1}^m \left[\left(\prod_{k=1}^n \left(\frac{p_{ijk}^t}{p_{ijk}^{t-1}} \right)^{w_{ijk}} \right) w_{ij}^t \right] \text{ for } t \geq 1.$$

4. A chain approach is an index number in which the value of any given period is compared to the value of its immediately preceding period, rather than to the base period.

Where

$$w_{ij}^t = \frac{\left(\prod_{k=1}^n \left(\frac{p_{ijk}^{t-1}}{p_{ijk}^{t-2}} \right)^{w_{ijk}} \right) w_{ij}^{t-1}}{\sum_{i=1}^m \left[\left(\prod_{k=1}^n \left(\frac{p_{ijk}^{t-1}}{p_{ijk}^{t-2}} \right)^{w_{ijk}} \right) w_{ij}^{t-1} \right]}$$

$$= \frac{\left(\prod_{k=1}^n \left(\frac{p_{ijk}^{t-1}}{p_{ijk}^{t-2}} \right)^{w_{ijk}} \right) w_{ij}^{t-1}}{\frac{I_j^{t-1}}{I_j^{t-2}}} \text{ for } t \geq 2.$$

$$w_{ij}^1 = w_{ij}^0$$

I_j^t : The index for industry j in period t .

p_{ijk}^t : The price of professional level k for company i in industry j at time t .

w_{ijk} : The weight of professional level k for company i in industry j .

w_{ij}^t : The price updated weight of company i in industry j at time t .

w_{ij}^0 : The base weights of company i in industry j . These are also the starting weights used at time 0.

The above formula is then aggregated across all firms to derive the total index.

3.4 Basket updates

Basket updates occur every 5 years and consist of updating the sample of establishments who provide pricing information as well as their operating revenue, which is then used to weight each company within the industry. The revenue weights assigned to each company at the time of selection remain fixed between basket updates.

The most recent basket update occurred with the release of the second quarter 2019 data in November 2019.

With the introduction of a new basket, historical estimates are linked to the new basket by maintaining the same historical quarterly changes. This is done by calculating a link factor for each index series as the ratio of the new index series to the old index series in the overlap period. This link factor is applied to the old index series to bring it up or down to the level of the new index. The overlap period for COSPI is currently the fourth quarter of 2017.

Partial weight updates occur every two years using new information provided by respondents to modify the shares of revenue by industry for each company. This partial weight update is undertaken with the assumption that the distribution of company revenues in the population have remained stable since the last basket update.

Appendix A: Concepts and definitions for COSPI

Concept	Definition
Base period	The period for which the index equals 100. The base period for the COSPI is 2018.
Price	The dollar amount invoiced divided by the total hours billed to clients in a given quarter.
Company	The company is defined as the lowest level organizational unit for which income statement and balance sheet accounts are maintained. From this, operating profit and the rate of return on capital can be derived.
Industry	Mutually exclusive grouping of consulting companies based on their work in either management consulting, or environmental, scientific and technical consulting services.
Professional level	The type or instance of consultant for which data will be collected. Data are collected only for those professional levels whose time is billed and/or invoiced directly to clients or customers. These levels are sometimes referred to as “front-facing” and do not include levels that serve “back office” functions and that are not typically billed directly to clients, such as administrative, HR, or accounting/finance. Examples include analyst, partner, etc.
Target population	All businesses in Canada that engage in the provision and sale of management, environmental, scientific or technical consulting services.
Judgement Sampling	With this method, sampling is based on previous ideas of population composition and behaviour. An expert with knowledge of the population decides which units in the population should be sampled. In other words, the expert purposely selects what is considered to be a representative sample.

Related information

For a more detailed description of the Consulting Services Price Index (COSPI), please visit the COSPI [Surveys and statistical programs page](#).

[Recently published data for COSPI](#) can be found on Statistics Canada’s “results and documentation of surveys and statistical programs” page.

Visit the [Producer price indexes portal](#) to view a wide variety of statistics and measures related to producer prices.