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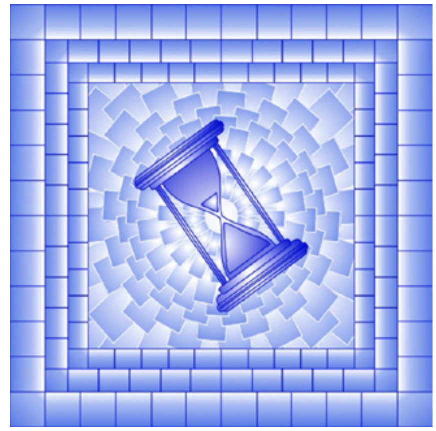
Technical Guide for the Accounting Services Price Index (ASPI)



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Technical Guide for the Accounting Services Price Index (ASPI)

1 Introduction

The Accounting Services Price Index (ASPI) measures the annual change in the price of accounting services in Canada. The ASPI is an indicator of economic activity in the accounting services industry, as well as a tool for the industry for performance evaluation, cost monitoring, contract assessment and benchmark comparisons. In addition, the ASPI is 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.

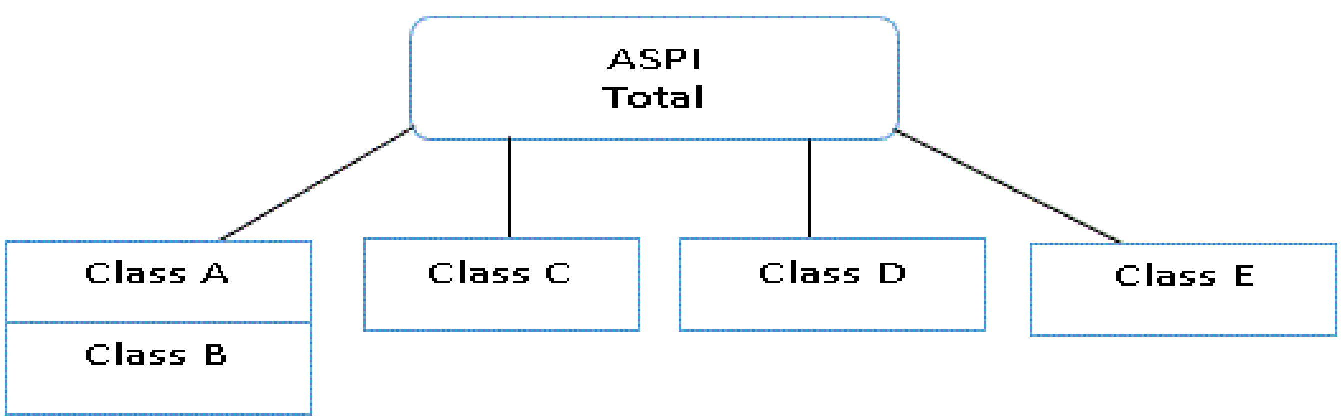
The Accounting, tax preparation, bookkeeping, and payroll services industry, North American Industry Classification System (NAICS) 5412, includes establishments that provide services in: auditing accounting records, designing accounting systems, preparing financial statements, developing budgets, preparing tax returns, processing payrolls, bookkeeping and billing.

For the purposes of the ASPI, services are classified into one of five classes:

- Class A: Audit, review and related services;
- Class B: Other assurance services;
- Class C: Bookkeeping, compilation, payroll and general accounting services;
- Class D: Tax preparation services for corporate clients;
- Class E: Tax preparation services for individuals and unincorporated businesses.

The ASPI is an aggregation of these five service classes. Data for each service class are collected separately in a questionnaire. An aggregation for Class A and Class B is created by pooling data for both classes (for each establishment separately). This is done as other assurance services (Class B) align best and are most similar to Audit, review and related services (Class A).

Figure 1
Overview of Aggregation Structure for the ASPI



Data collection for the previous fiscal year starts in June and finishes in November. While data is collected from respondents according to the fiscal year, for ease of understanding, the index is published annually in December for the prior calendar year.

Prices for services are determined either through time based rates or flat fees. Time based rates are calculated using the amount of time and the hourly, or daily, billing rate charged to the client for each level of professional working on a particular engagement. Flat fees, also called contingency or commission fees, are lump sums proportional to the size of the engagement or the outcome of the service provided. The ASPI attempts to use the time-based rate but can accommodate the less common flat fee rate when required.

To be able to measure the year-to-year percentage change in the prices of various service classes, respondents are asked to provide the total price charged to a particular client (net of indirect taxes) for a specific accounting contract provided in two consecutive years.

Appendix A defines key concepts used for constructing the ASPI.

2 Data Sources

2.1 Sampling process

The sample is drawn from the frame of all establishments classified to NAICS 5412. The probability of selection is based on the Sequential Poisson Probability Proportional to Size[1] sampling methodology.

The sample was last updated in 2016 using Business Register data for 2015. The targeted sample size of 1,000 establishments was chosen to obtain a sufficient number of price quotes to represent the industry.

2.2 Prices

Data for the ASPI are collected from a yearly survey of establishments who provide accounting services during the year in which the sample was selected.

Respondents are asked to report prices for contracts that are representative of the type of services they offer and which represent a substantial percentage of their establishment's annual revenue. They are asked to report prices for contracts that are likely to be renewed in the years following the initial survey.

The objective is to measure the change in price between contracts that provide the same service over time. However, few contracts remain identical from year to year. For this reason, respondents are asked to indicate how much of the year-over-year price variation is due to a change in the service provided and how much is attributable to a change in price for each representative contract. This variation can take the form of a change in the number of hours for the same service provided, or a change in the scope of the service performed for the client.

The data collected from establishments are manually 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 Annual revision

The ASPI is not subject to revision.

2.4 Quality Adjustments

To ensure that the service provided by the establishment is the same from period to period, respondents can provide an estimate of the change in the value of the service output due to a change in quality and/or quantity of the service provided. This value is then applied to the previous period to make the services for both periods comparable.

The year-over-year price relative for the engagement is given by:

$$Price\ relative^{\frac{t}{t-1}} = \frac{p_t}{\left(p_{t-1} + Quality_{\frac{t}{t-1}}\right)}$$

1. 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.

If we let:

p_t denote the price of a particular engagement in the current year,

p_{t-1} denote the price of the engagement in the previous year, and

$Quality_{\frac{t}{t-1}}$ denote the change in the value of the engagement between years t and t-1 that is attributable to quality change.

For Example, in 2017 an accounting firm invoiced a regular client $2500 for audit and bookkeeping services. In 2018, the firm no longer provided bookkeeping services to the client but still provided the audit services, invoicing the client $1000 for the work. When asked to report a dollar value for the difference in the work provided in 2017 and 2018, the respondent stated that bookkeeping services would have been invoiced at $1500. This amount is then subtracted from the value reported in 2017 to isolate the cost of the audit services provided in 2017 ($2500 - $1500 = $1000), and the price change between audit services provided to the client in both periods can be measured.

2.5 Weights

The annual weights used are a combination of the revenue data stored on the Business Register and the breakdown of the establishments' revenue according to the different classes of services offered. The revenue breakdown is reported as a percentage of the establishment's total revenue allocated to each service class. These percentages are then applied to the data obtained from the Business Register to derive a value for each service class by establishment. It is assumed that these derived revenues best reflect, in the aggregate, the relative importance over time of the service classes in the accounting industry.

3 Index Estimation and Aggregation

3.1 Introduction

The ASPI is based on a matched sample, where the same services are compared in consecutive periods. The ASPI is calculated for the current period and compared to the previous period to measure price change. The current period's ASPI can be compared to all previous periods using a chain approach.[2]

3.2 Calculation of elementary aggregates

At the first stage, the price relatives are aggregated using an unweighted geometric average to form a price index for each service class (A+B, C, D and E) for a particular establishment. These different initial level aggregations are referred to as elementary price indexes.

3.3 Compilation of upper level aggregated indexes

The elementary price indexes are then aggregated across establishments within each service class using a weighted arithmetic average known as the Young formula.[3] The weights used for this aggregation are derived from the proportions of the design-weighted[4] revenue for each service class, as reported by respondents.

2. 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.

3. Young price index, with price and quantity p, q: $P_y\left(p^0, p^t, s^b\right) = \sum_i s_i^b \left(\frac{p_i^t}{p_i^0}\right)$ where s_i^b is the expenditure share at the basket reference period b (prior to period 0), such that $s_i^b = \frac{p_i^b q_i^b}{\sum_i p_i^b q_i^b}$

4. Design weights refer to the inverse of the probability of selection of a given establishment at the time of sampling. These weights are then applied to the revenues to reflect their true share of the industry.

The index for service class j is given by:

$$Service\ Class\ Index^{j} = \sum_{i} \left(\frac{dr_{i}^{j}}{\sum_{i} dr_{i}^{j}} \right) I_{i}^{j}$$

If we let:

dr_{i}^{j} denote the design-weighted revenue attributable to establishment i in service class j , and

I_{i}^{j} denote the price index for establishment i in service class j.

For example, if according to a respondent, 20% of an establishment's total revenue for a fiscal year came from service Class D "Tax preparation service for corporate clients", then the total revenue would be multiplied by this 20% to derive the design-weighted revenue for that service class. These are referred to as service class indexes.

At the highest level of aggregation, the overall index is computed by taking a weighted arithmetic average of all service class indexes. The weight in the overall index for each service class index is the sum of the design-weighted revenues of the establishments specific to that service class.

For this case, the total ASPI is calculated by:

$$ASPI^{t/t-1} = \sum_{j} \left(\frac{dr^{j}}{\sum_{j} dr^{j}} \right) Service\ Class\ Index^{j}$$

if we let:

dr^{j} denote the total design-weighted revenue attributable to service class j.

3.4 Basket updates

Revenue weights of the establishments are revised on a regular basis to reflect current economic activity. The revenue weights assigned to each establishment at the time of selection remain fixed between basket updates. For the ASPI, this occurs every five years. Basket updates include adjusting revenue weights and updating the sample by adding or removing establishments to ensure that the target population is accurately represented by the index. Prices collected from the new sample will form a new index series using the revised weights.

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

Appendix A: Concepts and definitions for ASPI

Concept	Definition
Base period	The period for which an index is set to 100. The base period for the ASPI is 2010.
Engagement	A client or contract in a particular service class for which prices are available in at least two consecutive years.
Establishment	The establishment is the unit at which all accounting data required to measure production are available.
Price	The dollar amount invoiced to a client for a particular engagement in a given fiscal year.
Sample	The set of establishments drawn from the frame of all establishments classified to NAICS 5412. The sample size for the ASPI is 1,000 establishments.
Target population	All establishments engaged in accounting services in 2015. The survey frame consists of establishments with an annual revenue on Statistics Canada's Business Register[1] equal to or exceeding $50,000.

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