

APPENDICES

Overview of Appendices

APPENDIX 1 : Canada

APPENDIX 2 : Japan

APPENDIX 3 : Sweden

APPENDIX 4 : United Kingdom

Overview of Appendices

Appendices are composed of price indexes of four countries: Canada, Japan, Sweden, and the United Kingdom.

Canada adopts “unit value method.” The United Kingdom are now developing the “unit value method” for trucking prices, while other pricing methodology “rate method” is adopted in the current publishing price indexes. The level of unit, which is the unit for calculating the “unit value” prices, seems to be different depending on the data availability of each country.

“Representative prices,” which are selected for the Japan’s price survey, would be similar to the prices selected by the “rate method,” which is adopted by the United Kingdom and the United States. “Model prices,” which are also selected for the Japan’s price survey, reflecting both average revision rate of price table and discount rate, corresponds to the prices selected by the “unit value method” in terms of the coverage of services. Both pricing methodologies are aiming at capturing all services. However, the process for capturing prices of those is different. Japan’s “model prices” try to capture the changes of all service prices as a whole at once, while prices by the “unit value method” try to capture at the most detailed level based on homogeneous categories of services.

Pricing methodology that Sweden adopts looks similar to the “rate method.” Prices of each service are surveyed and aggregated by the Laspeyres formula.

APPENDIX 1:

Producer Price Index for Canadian Telecommunications Services

A. Pricing Methodology

Canada adopts the “unit value method” for trucking prices. The selection of pricing methodology has changed from the “bill method” as a result of discussion with the reporting companies. The “bill method” was too burdensome for them.

A-1. Unit value method

As for the concept of unit value, the Canadian approach is essentially the same as the U.S. approach. The only difference is in the level of detail of classification of the service.

A unit-price can be defined as:

$U_{c,m,t}$ for service plan c , mileage band m , in time period t , as the ratio of total revenue from the sale of Telephone services $i = 1, \dots, N$ to total quantity of output transacted in the same time period t . That is:

$$U_{c,m,t} = \frac{\sum_{i=1}^n P_{c,m,t}^i Q_{c,m,t}^i}{\sum_{i=1}^n Q_{c,m,t}^i}$$

Geographic characteristics, period of the day, mileage band and country destination for overseas long distance calls are different levels of specifications which allow for the identification of a homogeneous group of services with minimum substitution.

The price index was calculated retrospectively from a database containing the same customers from the beginning of the period to the end of the period. Having the same customers through time reduced in a way the substitutions between categories of services,

which could be attributable to new customers or to customers leaving a telephone company. For the current or ongoing time period, the price index calculation was based on revenues and quantity figures of all customers, including new comers and excluding customers who leave a telephone company. This approach introduces the potential for revisions when the index is published on a higher frequency than an annual index and comes into contradiction with the calculation, which was performed initially. It is not possible to identify customers who will remain with the same company for the current period under review.

The calculation of the price index was done according to the following steps:

- 1- Revenues and quantities were available at the most detailed level, that is; mileage band (distance covered by a communication), specific period of the day (rate = deep, peak, shallow, unknown), specific settlement (geographic arrangements called intra, adjacent, Canada, USA, overseas, other).
- 2- Revenues were divided by minutes at the most detailed level of aggregation to obtain a unit price ($R/Q=P$).
- 3- Unit prices of particular services were multiplied by the minutes of their corresponding monthly-averaged base period. Any hypothetical revenue figures (the numerator of the Laspeyres price index formula) obtained at an aggregated level were the result of the sum of revenues from a lower level of aggregation. Hypothetical revenues which would be derived by multiplying an *aggregated unit price* by its corresponding average minutes from the base period would give different results than results obtained from detailed calculations because of aggregation biases.
- 4- Price indexes were calculated by dividing hypothetical revenues for the current period by the corresponding actual revenues of the base period.
- 5- Calculations of the price index after discount at the total plan level were done by applying current period actual discount percentages to current period total plan hypothetical revenues. Net price indexes, were therefore equal to the ratio of the total net hypothetical revenue in the current period over the total net average real revenue of the base year.
- 6- At the end of the current year, a new average of minutes and revenues can be calculated to be used as a base period for subsequent years.

Calculating hypothetical revenues at the most detailed level of aggregation allows the construction of price indexes at different levels of aggregation, either geographical aggregations or time aggregations.

Preliminary analysis of the unit values for some individual service categories showed that there were regular fluctuations through time when price stability was expected to be the norm. This is an indication that the service categories may sometimes not be homogeneous enough to isolate pure price change from calling pattern changes. More work needs to be done in the definition of the classification of these services to attenuate this problem.

A-2. Bill method

In Canada, when presented with the bill approach, telephone company representatives showed reluctance in supplying such detailed information, arguing that it would be time consuming, that data were decentralized and that it would necessitate an unacceptable amount of resources, both human and material to meet these requirements. In fact, they were not convinced of the validity of calculating a price index in this manner.

The telephone companies reasoned that had they supplied the needed information this approach would have necessitated the re-pricing of millions of individual calls at every period. To put it another way, the construction of a price index based on this approach would have been equivalent to running another billing system for all telephone companies at every period of time. Even tariffs for long distance calls that do not change frequently through time have new plans introduced at any point in time by various telephone companies. This makes the calculation of such a price index even more complicated to manage.

Sampling of individual telephone bills was proposed as an alternative to reduce telephone company response burden. This approach was also dismissed based on the reasoning that if databases of individual telephone bills were to be read for sampling purposes, it was just as easy to ask for all the individual bills. However re pricing a sample of bills would have been a simpler exercise than re pricing all individual bills.

Assuming that telephone companies would have adhered to this approach of sampling, an additional unknown was whether the sample of bills would have been drawn according to sampling specification (either one out of ten bills for example or one out one hundred) and would have been representative of the entire universe of telephone bills. There was no study done to determine the optimum size of such a sample.