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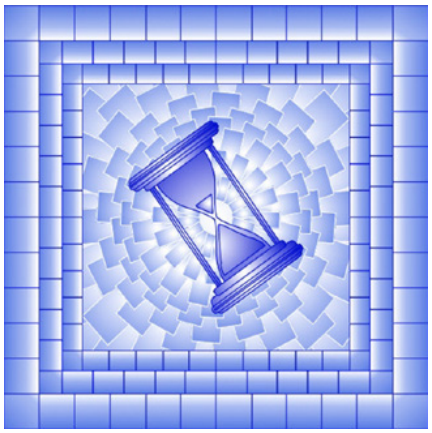
Enhancements to the Air Transportation Index in the Consumer Price Index



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Enhancements to the Air Transportation Index in the Consumer Price Index

Background

The Consumer Price Index (CPI) is an indicator of price change experienced by Canadian consumers. It compares, over time, the cost of a fixed basket of goods and services of constant quality. To do so, the CPI relies on data from multiple sources and on different methods to capture the expenditure patterns of Canadian households and to measure changes in consumer prices.

The air transportation index is part of the transportation component of the CPI. It estimates the average change, over time, of airfares within Canada and between Canadian cities and international destinations. Based on the 2017 basket weights, introduced in 2019, the index has a weight of 1.49% in the CPI.

As part of the ongoing review of methods and data sources used in the calculation of the Canadian CPI, a two-phased enhancement initiative aimed at improving the quality of the air transportation index is now complete. The first phase, implemented in the March 2018 CPI (released in April 2018), replaced prices obtained from administrative data sources with prices collected from the Internet. The second phase, implemented in the November 2019 CPI (released in December 2019), introduced automated airfare price collection through the use of application programming interfaces (API). As a result of the new data source for the air transportation index, the number of airlines, origin and destination cities, as well as the frequency of price collection have all increased.

Overview of phase 1

The goal of phase 1 was to better harmonize the air transportation index with consumer spending patterns, which have evolved to include shopping for, and purchasing, air travel online. Statistics Canada explored the use of Internet collected data for airfares faced by consumers when booking trips online. After a thorough evaluation, it was determined that Internet price data provided a reliable and representative data source for airfares, resulting in the following quality enhancements to the air transportation index:

- an increased number of airlines and city pairs;
- the introduction of booking lags representing advance airfare booking periods; and
- the standardization of the trip duration.

These changes were introduced with the March 2018 CPI.

Overview of phase 2

In the second phase, the number of airlines and destinations included were further increased as Internet price data were eventually replaced with prices collected automatically using API from Global Distribution Systems (GDS).[1]

API, which are standardized data request and response formats, integrate airline reservation systems with the GDS so travel agencies and consumers can search and book tickets online. They work by gathering input request parameters such as the origin, destination, and departure and return dates, and output a response file containing data such as base fare, taxes, and itinerary details. While API are not necessarily observed directly by consumers when shopping online, they facilitate many aspects of the digital economy, including travel booking.

Statistics Canada subscribes to two of the travel industry's largest GDS to obtain the airfare data used in the compilation of the air transportation index. These new data sources provide access to a wide spectrum of advertised flight prices and itinerary information via API.

1. Global Distribution Systems (GDS) are companies which enable and facilitate transactions between travel service providers and consumers. They represent the main data source and reservation point of contact for online travel agencies. The GDS collect and consolidate travel data from a wide range of service providers and allow travel agencies to reserve airplane seats, rent cars, book hotel rooms, etc. This avoids having to directly connect with hundreds of airlines, hotels and other end providers when arranging travel services.

Three assumptions underlie the use of API for airfares collection for the CPI:

- Flights and prices available through the GDS API are representative of flights and prices available to Canadian consumers through all market channels.
- The API are returning the lowest fares available.
- Collected prices are for leisure travel rather than for business, since business travel is not in scope for the CPI. This is managed by selecting economy-class tickets and by collecting prices well in advance of the departure date.

The following table summarizes the increases in coverage, frequency of collection and number of prices resulting from API data:

Table 1
Results of the introduction of API data

	Phase 1 (Internet price collection)	Phase 2 (API data)
Number of city pairs	53	180
Number of booking lags	2	4
Collection frequency per month	3	Daily
Prices per collection (per city pair)	2	Up to 15
Number of airlines	4	All airlines serving the Canadian market
Total prices used per month	636	Over 300,000 per API

Coverage

With API data collection, the sample of airlines used in the air transportation index was extended to include all airlines serving the Canadian market. To further ensure that prices are representative of important airlines in each city pair, revenue data from the Airport Activity Survey were used to establish a list of eight Canadian and eighteen international airlines for which at least one price is included in each daily city pair price selection.

Additionally, the second phase increased the number of city pairs to 180. The Fare Basis Survey (FBS) was used to select the representative domestic and international city pairs, with revenue estimates serving as an indicator of which city pairs to select. The FBS contains information that was used to derive airlines' revenue on each city pair.

For each city pair, booking lag, and collection day, the 15 least expensive fare observations are selected including at least one fare drawn from at least one of the important representative airlines mentioned above. The average of these 15 fare observations is calculated for each city pair, booking lag, and collection day using a geometric mean. These values are then aggregated to an average airfare for the reference month for each individual city pair using geometric means.

Price indexes of the 180 city pairs selected are grouped into elementary aggregates representing five travel destination sectors: domestic, transborder, transatlantic, southern and Asia-Pacific. To obtain the final air transportation index, those sectors are aggregated using basket weights derived from the Survey of Household Spending and the FBS.

Frequency of collection

The air transportation index is now calculated using prices obtained through daily API requests. The requests are made for a list of city pairs and also for different booking lags (i.e.: the number of days in advance of the departure date) to capture prices faced by consumers who book at different points in time prior to the date of departure.

Number of prices

The increases in coverage and collection frequency resulted in a significant augmentation in the number of prices used to calculate the air transportation index. This ensures the accuracy and reliability of the air transportation index in the CPI.

Conclusion

The move to API for the collection of airfare data provided an opportunity to significantly expand the sample of airlines and travel destinations, and to increase the frequency of price collection. These changes constitute important enhancements towards maintaining the quality and relevance of the air transportation index in the Canadian CPI.

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Statistics Canada. Fare Basis Survey (FBS) - Quarterly. Record number: 2708.

Statistics Canada. Survey of Household Spending (SHS) - Annual. Record number: 3508.