Implementation of Application Programming Interface and Administrative Data in the Canadian CPI

UN GWG on Big Data for Official Statistics
Workshop on Scanner Data and Official Statistics
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Delivering insight through data for a better Canada
Outline

• Overview
• Use of Application Programming Interface data in the Air Transportation price index
• Use of administrative data in the gasoline price index
Overview

• Application Programming Interface
  • Standardized data calls to companies that form the backbone of the travel booking industry

• Administrative data:
  • Data gathered by a company on prices and product characteristics
  • Time and geography dimensions
  • Shared with potential users (as National Statistical Agencies) for the production of (official) statistics

• Highly technology-based
Use of Application Programming Interface data in the Air Transportation price index
Context

- Internet manual collection
  - Packaged holidays and cruises (1.21%): 2013; 2 third party websites
  - Traveller accommodation (0.89%): 2015; individual hotels websites
  - Air transportation (1.49%): 2018; 4 websites

- Statistics Canada was looking at an improved collection for Airfares, traveller accommodation and packaged holidays
  - Cost effective production of CPI
What’s an API?

- Application Programming Interfaces (API) facilitate the exchange of information between data suppliers, programmers and app developers.

- A Global Distribution System (GDS) is a network that enables transactions between travel industry service providers and travel agencies.
API data acquisition

Initially, contacted 4 GDSs for API access, but two of them not feasible:

- Google Flights – Shutting down their API
- Amadeus – Not interested because we are not a Travel Agency
  - Amadeus now operates a self-service API: https://developers.amadeus.com/self-service
  - Option to develop and test for free
- You can try using this Travelport API demo for free: https://demo.travelportuniversalapi.com/

Two GDS agreed to do business

Access to their APIs for:
- Air fares
- Traveller accommodation
- Car rentals

Sabre

Travelport

HQ: Southlake, Texas, US        HQ: Langley, UK

Annual contracts, auto-renew
- 30 days notice required if either side wants to terminate
Internet manual collection and API collection: Cost comparison

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<th>Internet manual collection</th>
<th>Travelport</th>
<th>Sabre</th>
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<td>Traveler accommodation</td>
<td>Internet collection team 1</td>
<td>• API support and access fees</td>
<td>• API support and access fees</td>
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<td>Airfares</td>
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- Internet manual collection is very labour intensive and costly
- API collection requires advanced programming skills and is very cost-efficient
  - Collection costs reduced by 1/8
  - Number of individual price observations multiplied by 100 or 1000!
APIs mean more city-pairs, carriers and flight characteristics...collected quickly!
APIs vastly expand our access to airfare data

• More availability for city pairs when designing the product
  • Originally had 53 city pairs
  • Now essentially unlimited (180 city pairs selected)

• More availability of carriers
  • Originally had 4 carriers
  • Now essentially unlimited (more than 20 carriers included)

• More fare details available
  • Better knowledge of what we price

• More volume of data collected
  • Prices collected every day of the month
  • More booking lags priced

• Lower production cost
  • Low collection cost
  • Important investment to build a processing system
  • Low maintenance cost
Use of administrative data in the gasoline price index
Context

• Gasoline is a unique product in the CPI
  • Prices are volatile and can change notably day to day
  • Other products’ price movements can be captured reasonably accurately with one observation per month
  • Gasoline is priced multiple times per month

• Need for a better way to collect gasoline prices
  • Cost effective production of CPI
Previous gasoline price collection

- Based on a collection month composed of 4 pricing weeks
  - No prices collected for some weeks of the month
  - Sometimes, prices on previous month days are included in the current month

- If there are different price fluctuations over the month, then all of them are not well reflected in the price index
Previous gasoline price collection

- Large fluctuations in daily gasoline prices
Data confrontation

- Our CPI gasoline data confronted with data from a Company that monitors and collects gasoline prices on a daily basis in many Canadian cities
  - Has always been accurate, differences noted due to methodology differences
  - Daily data: Monday to Friday (excluding holidays)
  - Available for 70 cities plus select aggregations
Cost comparison

Data collection using company’s administrative data

- Annual collection cost reduced by 1/5
- More cities, different outlets per day per city
- Collection 20 days / month
- Number of price quotes multiplied by more than 8 (regular unleaded)

- Information on:
  - Price with and without taxes
  - Fuel grade (Regular, Mid-Grade, Premium, Diesel)
- Data received in .xml format at 4 PM every week day except holidays

StatCan field collection

- A number of representative cities, number of outlets varies by city
- Collection 7 days / month
- An acceptable number of price quotes (regular unleaded)
Benefits of using administrative data

• The index will:
  • reflect prices for the entire calendar month
  • be more accurate
  • be more in line with what the “outside world” expects
Price aggregation

• Arithmetic average monthly price per city
  • Days in a month are not weighted

• Weighted geometric mean in a geo strata
  • Population count will be used to weight cities within a geo strata

• Population count by city was chosen over volume.
Questions?

Thank you!