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Regional Fresh Fruit and Vegetable Price Indices Using Supermarket Scanner Data

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Regional Fresh Fruit and Vegetable Price Indices Using Supermarket Scanner Data

Timothy Beatty[1] and Samantha Snyder[2]

Objective:

The goal of this research is to construct regional price indexes for several categories of fresh fruits and vegetables, using innovative methods that allow for the use of high-frequency data, as well as multilateral price comparisons, i.e., spatial and temporal variation.

Current, widely used price indices in the US (CPI) do not incorporate consumer purchase behavior and are not comparable across regions of the country.

Results from this study and an extension to include all categories of food purchased for at-home consumption shed light on the argument for indexing food assistance benefits to regional prices rather than maintaining nationally-uniform benefit levels.

Data:

Store scanner data collected by IRI and furnished through a cooperative grant and data sharing agreement with ERS-USDA

- food purchases recorded at the store-UPC level
- made at a variety of retailer formats
- weekly purchase quantities and expenditures available between 2008 and 2012
- aggregated to the month-retailer level
- restricted to fresh fruits and vegetables
- retailers located within counties in 26 metropolitan statistical areas (MSAs)[3]

Background and Literature:

The CPI is calculated to provide aggregate and category specific price indices in the US.

The CPI relies on a fixed basket of goods and its calculation methodology has remained largely unchanged.

Store scanner data and the adoption of chained indices presents an opportunity to augment the traditional CPI.

- discrepancies between shelf price and price paid
- higher volumes purchased during periods of promotion

Chained indices are susceptible to chain drift

- index values do not return to one when prices return to base-period levels

Novel index construction methods allow for use of high-frequency data while mitigating problems like chain drift (Ivancic et al. 2011)

- rolling window GEKS index
- not absolutely free from chain drift but any drift is likely very small

To enable across-MSA price comparisons, rolling window GEKS index must also be made multilateral (Hill 1999, Hill 2004)

- minimum spanning tree methods chain bilateral price indices
- algorithm finds the spanning tree that results in least sensitive multilateral indices

Findings:

- temporal variations in fruit and vegetable prices (due to seasonality and other supply-side effects) are largely consistent across MSAs (Figure 1)
- prices are consistently higher in some MSAs (Figure 2)

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