

Quality Adjustment in the CPI

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CPI Basics

- Apple at Grocery Store X in Boston
- Data collector selects specifics (Apple variety, non/organic) based on sales information from respondent if available
- Sample is fixed for four years then rotated
- No direct price comparisons or adjustments for differences between rotated samples. Overlap pricing used.
- If a selected item becomes unavailable, replaced with a similar item



Item Replacement

■ Prices of old and new item can be...

- ▶ Comparable – Show all price change
- ▶ Non-comparable – Impute price change
 - Cell-relative or deletion imputation
 - Class-mean imputation – Based on price change of other item replacements
- ▶ Quality adjusted – Price of old good adjusted for features of new
 - Cost-based
 - Whole sale component cost x Markup
 - Four items:
 - Personal Computers and Peripheral Equipment
 - New Car and Truck Purchase
 - Used Cars and Trucks
 - Vehicle Leasing
 - Hedonic...

Items with Current Hedonic Adjustment

- Apparel Items (18 of 35)
- Telecommunications
 - ▶ Wireless Phone Service, Land-Line Telephone Services, Internet Access And Other Information Services, Cable And Satellite Television Service
- Electronics
 - ▶ Phones, Accessories, And Smartwatches; Other Video Equipment; Televisions; Photographic Equipment
- Housing (age adjustment, structural change)
 - ▶ Rent Of Primary Residence, Owners' Equivalent Rent Of Primary Residence
- Appliances
 - ▶ Refrigerators And Freezers, Washers And Dryers, Ranges And Cooktops, Microwave Ovens
- Research Series (applied retrospectively, when available)



Semi-log method

Estimation Equation:

$$\ln P_t = \beta X_t + \varepsilon_t$$

Price adjustment:

$$\hat{P}_{New,t+s-1} = P_{Old,t+s-1} * e^{(\hat{\beta}X_{New,t+s} - \hat{\beta}X_{Old,t+s-1})}$$

Price change used in index:

$$\frac{P_{New,t+s}}{\hat{P}_{New,t+s-1}}$$



Future Plans

- Alternative data will help address:
 - ▶ Number of observations
 - ▶ Product specifications
 - ▶ Quantity information
 - ▶ Additional statistical techniques



Contact Information

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