Evaluating Measurement Error in the Consumer Expenditure Survey

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Introduction

- U.S. Consumer Expenditure Quarterly Interview Survey (CEQ)
  - Monthly survey designed to capture continuous information about buying habits of Americans.
  - U.S. Census Bureau conducts survey for Bureau of Labor Statistics
- Data from the CEQ are used to calculate the weight of index items in the Consumer Price Index (CPI)
  - CPI is one of the nation's leading economic indicators

Background

- The CEQ presents a number of challenges
  - Long (5 one-hour interviews over 12 months)
  - Detailed questions
  - Burdensome to respondents
- Belief that some of the CEQ data are underreported or misreported, due to
  - Recall error
  - Panel conditioning
  - Respondent fatigue
- One possible solution: incorporate the use of respondent records instead of relying on recall only

CE Records Study Objectives

- Census Bureau contracted with RTI International to conduct the CE Records Study

- Study objectives:
  1. Evaluate the availability and feasibility of respondent records
  2. Measure the direction and magnitude of measurement error
  3. Understand respondents' interview experience

Methodology

- Participants completed 2 interviews within a 7-day period
  - First interview mimicked typical CEQ interview
  - Second interview matched records to expenditures reported in first interview
  - In-person interviews conducted by Field Interviewers (FIs)
- Convenience sample of 115 participants in Raleigh-Durham, NC and Washington, DC area
- Recruited a diverse sample with respect to: age, education, employment status, income, household size
- Participants were compensated $100 total
- Informed consent obtained for each interview

Methodology – First Interview

- **Interview 1:**
  - Subset of regular CEQ instrument
  - Standard CEQ procedures
  - Short debriefing questionnaire

- **Between interviews:**
  - Participants asked to collect records (e.g., receipts, bank statements, credit card bills) for all items asked about in Interview 1

Methodology – Second Interview

- FIs asked for a record for each item reported in Interview 1

- When applicable, FIs asked participants to explain why:
  - Reported amount did not match
  - No record available
  - Item not reported in Interview 1

Results – Availability of Records

- Records available for 36% of items reported
    - Only 8% of those records were inaccurate (not gold standard)
- More likely to have records based on 4 factors:
    - **Demographic characteristics**. Non-Hispanic white, DC participants, married and home-owners
    - **Date or frequency of purchase**. Items purchased regularly or items purchased recently
    - **Significance of the item**. More expensive items; participants often said they did not keep records for insignificant items
    - **Online records**. Common reason provided for not having records was that they were online; participants were unwilling or unable to print them

Results – Extent and Direction of Error

- Distribution of reports values:
  - 37% of reports were underestimated
  - 33% overestimated
  - 30% equaled the record value
- Reported value considered a "Match" if:
  - Reported amount within 5% of the record for items $200 or more
  - Reported amount within 10% for items less than $200
- Using this criteria, 53% of reports matched

Results – Magnitude of Measurement Error

- Determining magnitude of difference:
  - Difference between reported and record amount
  - Divided by smaller value
  - Retains relative value between under/overestimates

- Across all items, magnitude of dif. was 36%
- For misreported items, magnitude of dif. was 52%
  - Magnitude of underestimates was 48%
  - Magnitude of overestimates was 57%

Results – Respondent Experience

- 95% of participants said that the length of interview 1 (60 minutes) was just about right

- Almost half said they either sometimes, often or always guessed the cost of expenses, yet almost all thought their responses were accurate

- When not accurate, usually said "I guessed or estimated"

- Perceived accuracy associated with actual accuracy

  - Those who were more confident about responses, had slightly more accurate reports

  - But participants who said they were "extremely certain" only had matching reports for 63% of reported items

Discussion

- Relatively low level of record availability (36%)

- Participants tended to both underestimate and overestimate, by a substantial amount

- Factors associated with availability of record are not associated with accuracy of records

- Participants are overconfident about the accuracy of their responses

- CE Records Study was retrospective; next steps are to examine whether participants are able and willing to retain records for purchases they make in the future

Limitations

- Exploratory research study with non-probability sample

- Only 115 participants, demographic analyses limited

- Asked about a subset of CEQ, not full survey

- Participants only provided records for 36% of items – no way to know if the accuracy of reports when records were provided are similar to the accuracy of reports when records are not provided

More Information

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