

An Approach To Measurement Error Assessment For A Household Expenditure Survey

A Review And Application

Brandon Kopp, Lucilla Tan, & Scott Fricker
Bureau of Labor Statistics

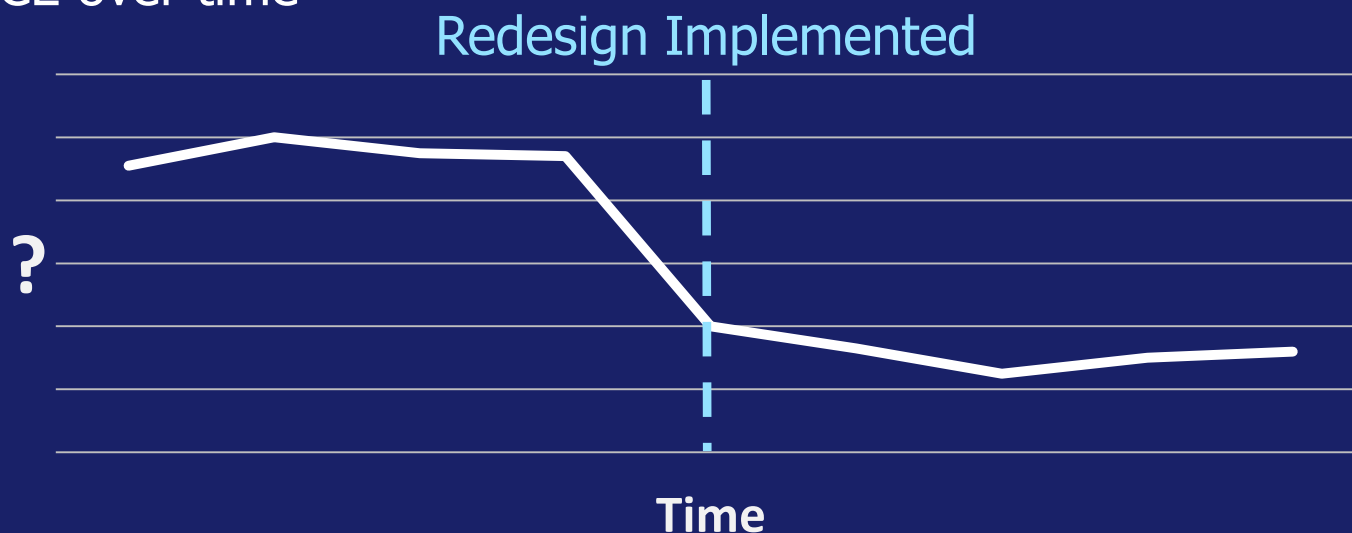
Roger Tourangeau
Westat

Federal Committee on Statistical Methodology
5 November 2013



Introduction

- The Consumer Expenditure Survey (CE) is involved in a multi-year redesign effort
- One goal of the redesign is to “improve data quality through a verifiable reduction in measurement error”
- Goal of this project was to research specific measures that could be used on an ongoing basis to track measurement error in the CE over time



Introduction

- We reviewed 37 past studies (internal reports, conference proceedings, and journal articles) that examined error in the CE
- A variety of methods have been used to assess error in the CE, each with their strengths and weaknesses
- We recommend a multi-method-indicators (MMI) approach that consists of three main categories:
 - ▶ Internal indicators (CE survey data or paradata)
 - ▶ External indicators (Comparisons with external data sources)
 - ▶ Record check studies (Comparisons with financial records)

Internal Indicators

- Those based solely on CE data or information about the data collection process
- Examples:
 - ▶ Comparing level of expenditures from earlier waves with later waves
 - ▶ Number of contact attempts required for a completed interview
- Weaknesses -
 - ▶ Can't really estimate the magnitude of the errors (e.g., proportion of respondents consulting records);
 - ▶ These are indirect indicators.

Internal Indicators

Criteria for Selection

- **Sources of error:** Should give some indication of the relative magnitude of different types of reporting error (recall, conditioning, satisficing)
- **Availability/stability:** Should tap data that will be available over time
- **Utility for improving items or survey procedures:** Should help identify problems that can be fixed

An Illustrative Set of Internal Indicators

- Entries in the CE Diary versus data collected by recall at pickup (recall error);
- The ratio of the number of entries in diary week one and diary week two (conditioning);
- The percentage of respondents who use records during the Quarterly Interviews (recall error);
- Interview duration (satisficing).

External Indicators

- Comparison to external data sources
- Examples:
 - ▶ Personal Consumption Expenditures (PCE) from National Income and Product Accounts
 - ▶ Other household surveys (e.g., MEPS, PSID, RECS)
- Weaknesses —
 - ▶ Not clear external benchmarks are really more accurate than the CE;
 - ▶ Errors in PCE are not well established.

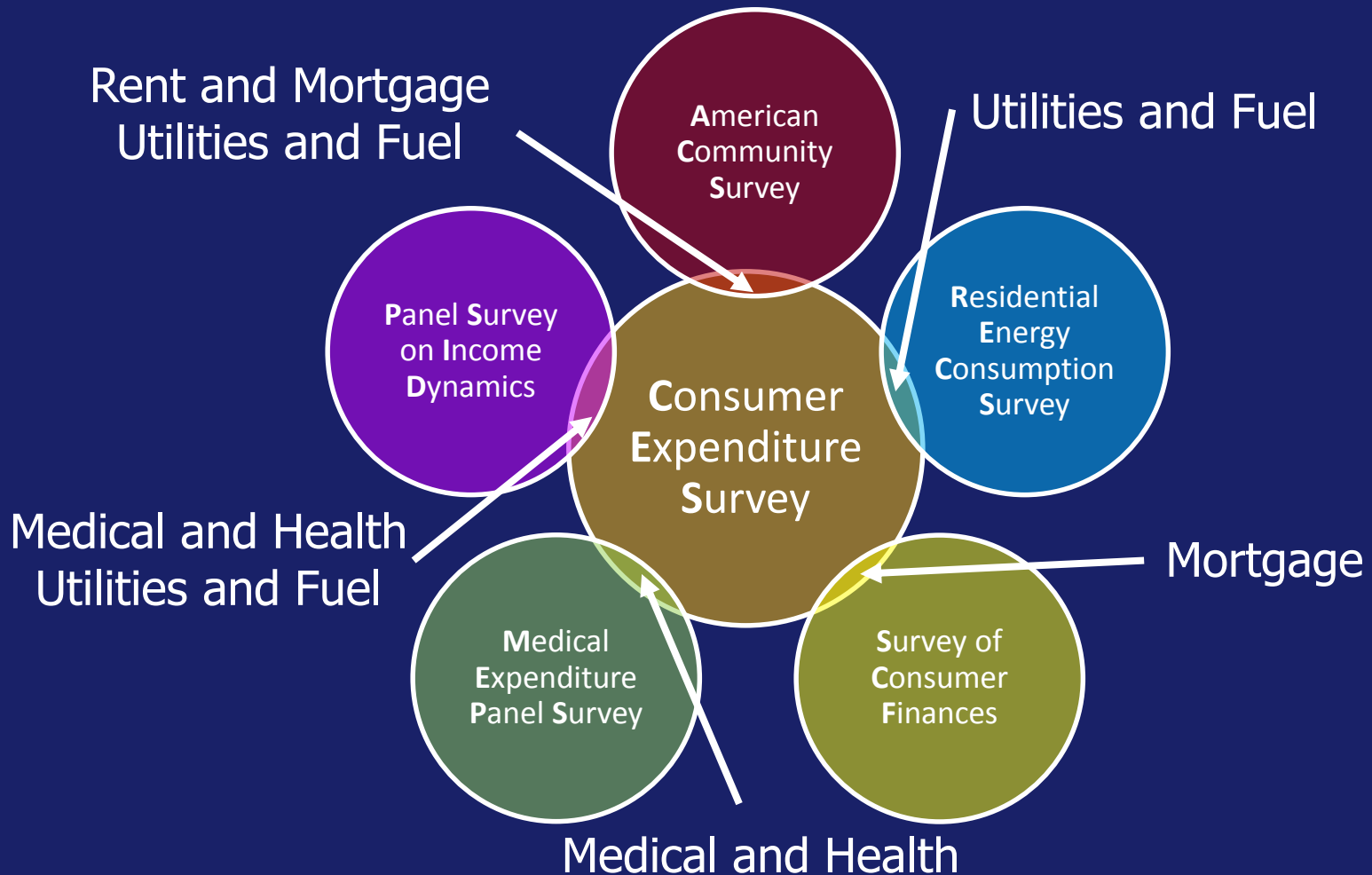
External Indicators

Criteria for Selection

- Cover a range of categories, including some that differ in the likely availability of records;
- Include both regular (e.g., rent/mortgage, utilities) and irregular (e.g., clothing) expenditures;
- Include both large and small expenditures;
- Focus on categories in which the external source uses a definition that is reasonably consistent with the CE definition.

External Indicators

Other Household Surveys



Record Check/Validation Studies

- Compare CE reports to actual bills or other records
- In principle, this method most accurately quantifies error magnitude, but it has many practical difficulties
 - ▶ Relatively expensive;
 - ▶ Respondents don't save all of their records;
 - ▶ Respondents may not want to share their records;
 - ▶ Some types of purchase unlikely to generate records;
 - ▶ Likely to produce high rates of unit and item nonresponse.



Record Check/Validation Studies

Criteria for Selection

- Use many of the same categories as in external indicators to assess convergence
 - ▶ Utilities and fuel;
 - ▶ Rent and mortgages; and
 - ▶ Hospitalization and health insurance.
- And others that are likely to yield receipts
 - ▶ Men's and boy's clothing;
 - ▶ Women's and girls clothing;
 - ▶ Major appliances; and
 - ▶ Food away from home.

Additional Considerations

- **Cost:** What inputs are needed to develop each MMI component?
- **Duration for development:** How long will the development efforts take?
- **Applicability:** Is the component applicable only to the current CE design or will it remain applicable to other designs?
- **Periodicity:** How often can the indicators be tracked?

Summary

- No one approach is perfect
- Develop a time series with multiple indicators
 - ▶ Internal indicators
 - ▶ External indicators
 - ▶ Supplemented with periodic (but regular) record check studies
- Have overlapping expenditure categories to assess convergence across methods

Contact Information

Brandon Kopp

Research Psychologist

Office of Survey Methods Research

[*www.bls.gov/osmr*](http://www.bls.gov/osmr)

202-691-7514

kopp.brandon@bls.gov

