The Gemini Project: The Consumer Expenditure Survey Redesign Initiative

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Presentation Outline

1. CE Program Overview
2. CE Methods Improvements
3. Redesign Overview
4. Proof of Concept Test Overview
5. Challenges Ahead
Survey Goals

- To meet the need for timely and detailed information about the spending patterns of different types of households

- To provide the basis for revising the expenditure weights for the Consumer Price Index (CPI) every two years
Survey History

- First BLS survey was in 1888-1891, conducted sporadically until 1940s, and then every 10 years.
- The continuing CE began in 1980, with a recognized need for a constant source of data on the economic condition of America’s consumers.
- The continuing CE allowed CPI to revise weights more often (initially a 3 year cycle, now a 2 year cycle with sample expansion in 2000).
- Current design based on 1972-73 survey format.
Scope & Sample

- Nationwide survey designed to represent the U.S. civilian non-institutionalized population
- Data are collected from consumer units (CUs) - people living at one address who share living expenses (in most cases, same as HHs)
- The survey is designed to represent all urban and rural areas in the U.S. (of note, CPI only uses the urban sample)
- Sample selection begins with definition and selection of geographic areas (currently 91 PSUs in sample)
Data Collection

The U.S. Census Bureau collects CE data for the BLS using two different surveys, with separate samples:

- Interview, quarterly, 4 interviews, n=28K per year
- Diary, 2 weekly diaries, n=14K per year

Respondents in both surveys are asked to describe “all” of their spending. Business expenses and reimbursements are excluded.
Interview & Diary Improvements (1)

- CAPI Interview (2003)
- CAPI Diary demographics and income (2004)
- Contact History Instrument (2005, 2006)
- User Friendly diary (2005)
- Diary auto-coding system (2005)
- Biennial Interview questionnaire revisions (2005-15)
- Elimination of bounding interview, reducing survey from 5 to 4 waves (2015)
Interview & Diary Improvements (2)

- Timely and relevant questionnaire revisions
  - Medicare prescription drug program (2006)
  - Tax stimulus: amount and how used (2008, 2009)

- Statistical methods improvements
  - Improved Diary/Interview source selection for best publication estimates (biennially since 2007)
  - Income tax estimation implementation (2013)
Gemini Project: Motivation

- Evidence of measurement error
- High level of burden (presumed to negatively affect data quality)
- Need for greater operational flexibility
- Changes in spending behaviors and technology

Redesign Overview
Gemini Project: Motivation

Have you left a money trail for anyone to find on Venmo?

Aran Khanna, Medium
Oct. 30, 2015, 2:23 PM 4,561

The transaction history for a user I am not friends with and have no mutual friends with.

Redesign Overview
Gemini Project: Objectives

- Verifiable reduction in measurement error, with a particular focus on underreporting
- No harmful effect on response rates
- Neutral impact on budget
- Secondary objective: Reduction in burden
Data Requirements

- Annual expenditure estimates of total household spending for the U.S. population
- Month of expenditure(s) for each expenditure category
- Data collected at a minimum of 2 points in time, 1 year apart
- Minimum set of expenditure/non-expenditure data elements from each household
Key Proposal Inputs

- National Academies’ Committee on National Statistics (CNSTAT)
- Expert panels
- External discussion events
- Ongoing research on key topics
- Census staff & Field Representative (FR) input
Design Proposal

Wave 1

- Advance Mailing
- Visit 1: Recall Interview
- Diary Week & Records Collection
- Visit 2: Records Interview

Wave 2

- Advance Mailing
- Visit 1: Recall Interview
- Diary Week & Records Collection
- Visit 2: Records Interview

12 months between waves

Respondent engagement mailings

Post Wave 1
Non-monetary Incentive: CE Experience Package

Redesign Overview
Comparison of Design Features

Redesign Overview

Current CE

Redesigned CE
Current vs. Redesign: Sample Design

<table>
<thead>
<tr>
<th>Current</th>
<th>Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two independent Samples (Diary and Interview)</td>
<td>One Integrated Sample (Interview, with Diary keeping component)</td>
</tr>
</tbody>
</table>

Advantage:
- Reduced costs of maintaining two samples
- Diary level detail for all CUs

Disadvantage:
- Potential burden for household completing both the Interviews and Diary
## Current vs. Redesign: Interview

<table>
<thead>
<tr>
<th>Current</th>
<th>Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Interview for large, recurring expenditures</td>
<td>2 interviews: Recall based and Records based</td>
</tr>
</tbody>
</table>

**Advantage:**
- Ease respondent burden with half of typical content of the current interview
- Better quality data for records focus

**Disadvantage:**
- Rely on completion of 2\textsuperscript{nd} interview for complete spending from one household

 redesign Overview
## Current vs. Redesign: Diary (Mode)

<table>
<thead>
<tr>
<th>Current</th>
<th>Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two one-week open ended paper diaries</td>
<td>Electronic one week diary with paper back-up</td>
</tr>
</tbody>
</table>

### Advantage:
- Electronic diary – more flexible and easier for respondent
- Electronic diary – in the moment reporting
- Respondent uses mode most comfortable with (Electronic or Paper)

### Disadvantage:
- Design of electronic diary does not meet respondent expectations

*Redesign Overview*
USDS execs: Americans expect Uber-like government

Federal agencies haven’t kept up with Americans’ expectations fueled by private-sector technology, and that’s eroding citizens’ trust in their government, experts say.

With the invention of the smartphone and a culture driven by on-demand, on-the-go apps, U.S. Digital Service Administrator Mikey Dickerson said Americans’ expectations for their interactions with government are being set by companies like Apple, Facebook and Uber.

Challenges Ahead
Current vs. Redesign: Diary (Level)

<table>
<thead>
<tr>
<th>Current</th>
<th>Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single paper diary per household</td>
<td>Individual diaries for all households 15 and over.</td>
</tr>
</tbody>
</table>

**Advantage:**
- Reduce error due to proxy reporting
- Spreads burden across household members, instead of on an individual respondent
- Increased salience among participants

**Disadvantage:**
- Requiring all household members to complete diary could reduce response.

*Redesign Overview*
Current vs. Redesign:
Incentives

<table>
<thead>
<tr>
<th>Current</th>
<th>Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Incentives</td>
<td>Performance-based incentives at the individual and household level</td>
</tr>
</tbody>
</table>

Advantage:
- Increase response rates
- Increase respondent motivation/Improved data quality
- Fewer contact attempts needed to complete interview (saves money)

Disadvantage:
- Costly

Redesign Overview
### Current vs. Redesign: Expenditure Categories

<table>
<thead>
<tr>
<th>Current</th>
<th>Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed UCC level</td>
<td>More highly aggregated</td>
</tr>
</tbody>
</table>

**Advantage:**
- Fewer questions – reduced burden and interview length

**Disadvantage:**
- Less detailed expenditure data
Current vs. Redesign: Waves

<table>
<thead>
<tr>
<th>Current</th>
<th>Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 waves - 12 consecutive months of expenditures per CU, each wave treated independently</td>
<td>2 waves - 3 months of expenditures, set 12 months apart, each wave treated independently</td>
</tr>
</tbody>
</table>

Advantage:
- Improvement of annual variance estimates
- Reduced measurement error resulting from conditioned underreporting
- Analysis of 12-month change in expenditures/income

Disadvantage:
- FR may lose rapport with respondent between waves
- Some users need one year of expenditures/income for analysis

Redesign Overview
# Linking Redesign Features with Data Quality Improvements

<table>
<thead>
<tr>
<th>Redesign Feature</th>
<th>Link to Data Quality Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentives</td>
<td>Increase cooperation &amp; engagement</td>
</tr>
<tr>
<td>Technology</td>
<td>Promote real-time data capture</td>
</tr>
<tr>
<td>Individual diaries</td>
<td>Reduce proxy reporting</td>
</tr>
<tr>
<td>Reduced interview length</td>
<td>Reduce burden</td>
</tr>
<tr>
<td>Reduced survey content</td>
<td></td>
</tr>
<tr>
<td>Increased record use</td>
<td>Increase accuracy</td>
</tr>
</tbody>
</table>

*Redesign Overview*
Redesign Features: Benefits of Record Use

CE Interview Survey: record usage and reported expenditures

<table>
<thead>
<tr>
<th></th>
<th>1 person CU</th>
<th>2-3 person CU</th>
<th>4+ person CU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Records use more 50% of the time</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Total reported expenditures</td>
<td>0</td>
<td>10000</td>
<td>20000</td>
</tr>
</tbody>
</table>

Redesign Overview
Redesign Features: Benefits of Incentives (1)

Number of contact attempts to attain final disposition

- 2009 study (n=21,733)
- 2015 study (n=18,301)

Cumulative percent

No. of attempts at contact

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

Redesign Overview
Redesign Features: Benefits of Incentives (2)

CE Interview Survey Doorstep concerns and reporting behavior in Wave 5
(Kopp, McBride, and Tan (2013; Table 11)

- Doorstep concerns: None (n=1,360)  Low (n=657)  High (n=484)

- Records used >90% of the time (% n)
  - None: 23.9
  - Low: 10.6
  - High: 14.7

- Information book used >90% of the time (%n)
  - None: 27.1
  - Low: 14.7
  - High: 35.7

- Number of reported expenditures
  - None: 43.9
  - Low: 35.7
  - High: 20.9

- Prevalence of edited expenditure (% MTAB records)
  - None: 15.6
  - Low: 20.9
Proof of Concept Test (POC): Overview

- Ensure that the basic underlying structure and components of the new design are feasible
- Designed to mirror the proposed design to the fullest extent possible
- Conducted with Census production FRs
- Sample performance –
  - 53 percent response rate (preliminary)
  - $n=515$ (expected)
Proof of Concept Test (POC): Research Objectives

- Methodological issues - Ability & willingness of respondents to complete all components, i.e. provide recall information, complete diary, provide records

- Operational factors - Contact attempts needed, length of visits, technical issues with individual diaries, effectiveness of or logistical issues with incentives

- Experiential factors –
  - Respondent experience (task difficulty, level of effort, reactions to materials/incentives)
  - FR experience (difficulties completing interview, time spent on each case)

- Effectiveness of system and material improvements
POC Web Diary

POC Overview
RECORDS CHECKLIST

FOR THE MONTHS OF

JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC

COLLECT AND ORGANIZE YOUR HOUSEHOLD'S RECORDS IN 3 STEPS

FIND IT AT HOME OR ONLINE  FILE, SAVE, OR PRINT  CHECK THE BOX

Housing
- Mortgage loan statement (principal, interest, escrow payments)
- Purchase or Sale of a property (closing costs, HUD-1 statement)
- Rent
- Real Estate or Property Taxes
- HOA or Condo Fees
- Maintenance and repairs (plumbing, gutters, landscaping, construction jobs)
- Household operations (moving fees, storage, security)

Utilities
- Telephone/Cell phone bill
- Cable/Satellite TV bill
- Internet bill
- Electricity/Natural gas bill
- Water/Sewer bill

Vehicles
- Bill of sale or lease agreement (new, used, or leased cars, boats, campers, motorcycles)
- Financing agreements
- Licensing, registration, and inspection fees and property taxes

Insurance
- Homeowner’s/Renter’s insurance statement
- Health insurance statements
- Vehicle insurance statement
- Life insurance statements
- Other insurance (long term care, supplementary health, pet insurance, umbrella policies, flood insurance)

Medical Care
- Out-of-pocket payments (copayments, coinsurance, reimbursable expenses)
- Doctor’s appointments, dental visits, eye exams
- Lab tests, x-rays, hospital stays
- Adult care (nursing or convalescent homes, daycare)
- Eye glasses and hearing aids
- Rental equipment
- Prescriptions

Remember to get all...
- Paystubs
- Checkbook registers
- Credit Card statements
- Bank statements

POC Overview

Your Field Representative will not collect your records and your information will remain confidential and not shared with anyone.
POC Preliminary Findings

- Response rates exceeded expectations based on earlier tests (although still lower than production)
- Feedback about the new design from the FRs via debriefings was very positive
  - Liked the ability to hand the incentives to the respondent after completed interview
  - Felt incentives helped gain cooperation and improve quality throughout the process
- An early look at Visit 2 shows record use to be strong, with at least 1 record for 88% of interviews (and almost half of the 10 sections)

POC Overview
Timeline for Redesign Development & Implementation

Design Proposal and Planning
- Approved redesign proposal released (July 2013)
- User impact of redesign (July-December 2013)
- Roadmap developed (September 2013)

Field Tests (Develop, Field, Analyze)
- Individual and Web Diaries (2012-15)
- Proof-of-Concept Test (2015)
- Incentives Test (2016)
- Large-Scale Feasibility Test (2019)
- Dress Rehearsal (2021)

Implementation date depending on funding availability

Challenges Ahead
Challenges Ahead: Organizational

- Meeting (or amending) redesign requirements
  - Reducing respondent burden due to data security requirements for online instruments
  - Enabling FR handling of incentives
  - Returning “data of value” to respondents through a spending summary report

- Administrative data linkage projects
  - Incorporating innovations and lessons learned from using auxiliary housing and income data files from 3rd party aggregators (in conjunction with CARRA)
Challenges Ahead: Timing

- **Challenge**: Synthesizing test results into in-progress redesign testing and implementation.

- **Question**: With the redesign project schedule constrained by time and funding, how to develop a structured approach to designing and implementing successor tests without complete information from predecessor tests, and options for updating test plans in progress?
Challenges Ahead: Technological (1)

- **Challenge**: Keeping up with the pace of technological change & meeting respondent expectations

- **Question**: With the increased pace of technological innovation and social penetration/adoption, thoughts regarding extent of the program office’s redesign resources to be allocated to ongoing environmental scanning and evaluating new approaches, in the context of an existing full scale redesign effort; also thoughts on opportunity and cost structure trade-offs?
Challenges Ahead: Technological (2)

- **Challenge**: Negotiating the promises and pitfalls of emergent private sector technologies, many with limitations that are not yet fully understood or well suited to the Federal government data collection environment?

- **Example**: Frequently hear some variation of “why don’t you just use Mint.com”, but no discussion of:
  - respondent concern about government data linking
  - unbanked respondents
  - incomplete account linking
  - lack of entries for cash transactions
  - insufficient details in big box store transactions
  - vast differences in technological sophistication by both FRs and respondents