The Telephone Point of Purchase Survey Cell Phone Test and Implementing a Cell Phone Frame

Gabriela Arcos
Index, Cost Weights, and Special Projects Section
March 28, 2012

BLS
BUREAU OF LABOR STATISTICS
U.S. DEPARTMENT OF LABOR

Objectives

- Give an overview of the Telephone Point of Purchase Survey (TPOPS)
  - Non-response bias
- Outline Cell Phone Frame Test
  - Goals of the test
- Results
- Implementation of a dual frame design

BLS

The Telephone Point of Purchase Survey

- Is conducted by the Census Bureau for the BLS
- Collects outlets and expenditures
  - TPOPS serves as the main source for the outlet sample for the CPI
  - Consumer expenditures are used for outlet selection

BLS

The Telephone Point of Purchase Survey

- Brief History
  - Between 1977 and 1996 TPOPS was a paper based survey
  - In 1997 it was converted to a random digital dialed computer assisted telephone interview (CATI) survey
  - It was also converted to a quarterly survey, utilizing a rotating panel design

BLS

TPOPS Non Response Bias Analysis

- Conducted a non-response bias analysis
  - Also an OMB requirement for clearance
- Evaluated respondent burden, cost, and survey design
- Main question: **Are the results of your survey biased because the behaviors of non-respondents might be different than those people who respond?**

BLS

TPOPS Non Response Analysis

- Since 1997 response rates in TPOPS have fallen from 68.2% to 47.1% in 2011
  - Drop may be attributed to telephone calls being screened, or reluctance to give out any personal information
- Demographic age cohorts in TPOPS sample revealed bias

BLS

American Community Survey Compared to TPOPS

AGE OF HOUSEHOLDER	ACS (Census)% 2007	TPOPS (landline)% 2007
Under 35 years	21.8%	11.2%
35 to 44 years	20.4%	17.2%
45 to 54 years	21.3%	21.9%
55 to 64 years	16.3%	22.0%
65 to 74 years	9.9%	15.2%
75 to 84 years	7.5%	10.1%
85 years and over	2.7%	2.4%

BLS

Potential Reasons for Differences in Age Cohorts

- TPOPS survey design
  - **Frame includes no cell phone numbers**
- NHIS reports increase in cell phone usage in last 10 years
- Percentage of adults living in **CELL PHONE ONLY** households
  - 7% in 2003
  - 30% in 2011

BLS

Goals of the Cell Phone Test

- Determine a hit rate, how many cell phone numbers we would need to get one productive interview
- Determine the costs associated with fielding a cell phone frame

BLS

Challenges in Developing the Cell Phone Test

- Cell phone studies are done at a national level
- TPOPS needs county level data to meet CPI definitions of Primary Sample Unit (PSU).
- No guarantee of active cell phone numbers used by consumers
- Designing a single interviewing instrument to handle both the cell phone frame and the landline frame

BLS

Design of the Cell Phone Test

- Cell phone test was conducted the second quarter of 2011.
- Between 200-400 calls were made per PSU
- Total sample: 19,300
- Calls completed over 4 weeks

BLS

Results of the Cell Phone Test

- Hit rate (of first interviews) = Productive interviews/total calls made
- Average hit rate (cell phone): 9.4%
- Average hit rate (landline): 16.9%
- A completed interview in the cell phone frame costs twice as much as in the landline frame
  - No pre screening of cell phone sample, unlike landline phone number banks where we are guaranteed residential numbers

BLS

Demographic Analysis

- Significant demographic differences were found between landline and cell phone frame
  - Age cohorts- Cell phone data included younger cohorts
  - Gender cohorts- More male respondents were in the cell phone data
  - Hispanic households- Cell phone data included some additional Hispanic households

BLS

TPOPS: Comparison of Landline to the Test Cell Phone Frame

AGE OF HOUSE HOLDER	TPOPS: Landline Sample	TPOPS: Cell Phone Sample
18-25 years	1.1%	11.1%
26-35 years	6.8%	20.3%
36-45 years	13.4%	18.8%
46-55 years	21.6%	20.1%
56-65 years	23.4%	15.3%
66-75 years	17.1%	6.5%
76 and older	12.5%	2.7%

BLS

Demographic Analysis Continued

- Gender
  - Males represented 47.8% of the cell phone data compared to 36.8% in the TPOPS landline sample
  - Females composed 52.2% of the cell phone data compared to 63.2% of the landline sample
- Hispanic households made up 10.9% of the cell phone data compared to 3.4% of the landline sample

BLS

Results on Cell Phone Movers

- Cell phone frame
  - Portability of phone numbers
- Landline frame
  - Move out of PSU, out-of-scope
- Results:
  - 312 moved to another CPI PSU, out of 1,803 completed and partially completed interviews

BLS

Reported Outlets

- Goal of TPOPS
  - Unbiased source of outlets for CPI
- Do younger people shop at different outlets
- Cell test = small sample
- Can't draw definitive conclusions

BLS

Cell Phone Test & Landline Outlet Overlap

Commodity/Services Group	Overlap in the top 20 reports
Groceries	75%
Apparel	70%
Electronics	65%
Music	35%
Food Away From Home	40%

BLS

CE Outlet Overlap Between Cell Phone Only and Landline Reports

Results from outlet question added to the Consumer Expenditure Survey in the second quarter of 2011

Commodity/Services Group	Overlap in the top 20 reports
Groceries	70%
Apparel	70%
Electronics	75%
Music	70%
Food Away From Home	65%

BLS

Implementation of The Dual Frame Design

- Instrument updates
  - Accommodating returning cases
  - Households that have moved
- Weighting
  - Overlapping RDD frames
- Sampling
  - Setting targets by frame at the PSU level

BLS

Is TPOPS Problem Solved?

- Increased call screening in both frames
- Deteriorating quality of frames
  - Landline frames are not as reliable due to proliferation of VOIP phone services
    - Magic Jack, Vonage
  - Source for county level cell phone numbers
    - Activated phone numbers through wire towers
      - Can include people outside PSU
      - Can include numbers not being used yet

BLS

Acknowledgements

- BLS colleagues:
  - Madeleine Saxton
  - Caitlin Blair
  - Chris Miller
  - Erik Bergmann
  - Sara Stanley
- Census colleagues:
  - James Arthur
  - Aniekan Okon

Contact

- Gabriela Arcos

  Arcos_g@bls.gov

  202-691-6942