SPM Thresholds: Imputing Subsidies to the Consumer Expenditure Survey for Poverty Measurement

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All Poverty Measures

- Not Poor
  - Resources

- Threshold

- Poor
  - Resources
This Research

Purpose

- Justification to add in-kind benefits to out-of-pocket spending data upon which Supplemental Poverty Measure (SPM) Thresholds are based
- Impute benefits, at the micro-level & examine inclusion on all “expenditures”
- Produce SPM thresholds that include the value of in-kind benefits

Contribution

- Improved SPM that is consistently defined in terms of thresholds and resources
- Improved SPM thresholds that more nearly reflect consumption of basic bundle

*NOTE: Thus far, SPM thresholds used by the Census Bureau for the regular publication of SPM poverty statistics DO NOT account for in-kind subsidies.*
2012 SPM Thresholds with and without In-Kind Imputed Benefits: 2 Adults with 2 Children (“2A+2C”)

- Owners with mortgages
  - Only Food Stamps: $25,105
  - CPS Binary + FMR: $22,044
  - CPS Binary + Two Stage Rent Imputation: $21,400

- Owners without mortgages
  - Only Food Stamps: $25,784
  - CPS Binary + FMR: $22,026
  - CPS Binary + Two Stage Rent Imputation: $21,400

- Renters
  - Only Food Stamps: $26,459
  - CPS Binary + FMR: $26,392
  - CPS Binary + Two Stage Rent Imputation: $26,818
Density of FCSU and FCSU-IK for 2A+2C
Density of FCSU and FCSU-IK for 2A+2C around the 33rd Percentile

Shift in Distribution

FCSU-IK “33rd

FCSU “33rd”

Dollars

Density

PLOT  FCSU-ONLY  FCSU-MSLP  FCSU-WIL  FCSU-LRTEAP  FCSU-RENTSED  FCSU-IK
NAS Justification

- Effectiveness of benefit programs on poverty measurement

- Thresholds and resources consistently defined with each other

  - “...proposed thresholds, although developed in somewhat different ways, reflect concept of budget for consumption needs” (NAS Report, 1995, pp. 66-67)

  - “Hence, ... resources should add to money income the value of near-money in-kind benefits that are intended to support consumption” (pp. 67)
Underlying Assumptions

- Resources to meet “needs”
- Thresholds represent “needs”

“Consumption Needs” defined as
- Food
- Clothing
- Shelter
- Utilities
- + “a little bit more” for personal care, non-work related transportation, etc.

- **Threshold Concept**: FCSU “consumption needs”
- **Measurement Concept Assumed**: CE expenditures that include housing assistance subsidies (rent and utilities) and benefits from food stamps and free meals (NAS, 1995, pp. 393-394)
NAS Proposal and Measurement Assumption: Consistency

Thresholds

FCSU+ "little bit more" Consumption =
CE “Expenditures” (that include: housing assistance subsidies, benefits for food stamps and free meals)

Resources

Consistent

Housing & Energy Subsidies
Other Food Subsidies
With SNAP In-Kind Benefits
Cash income
Missing Data Problem: Thresholds and Resources Inconsistently Defined

Thresholds

CE OOP Expenditures for FCSU (including SNAP)

Resources

Housing & Energy Subsidies
Other Food Subsidies
With SNAP In-Kind Benefits
Cash income

Currently published SPM

Consistent

- ITWG stated ...
  - “so far as possible with available data, the calculation of FCSU should include any in-kind benefits that are counted on the resource side for food, shelter, clothing and utilities. This is necessary for consistency of the threshold and resource definitions.” (March 2010)

\[
FCSU = \text{sum (food, clothing, shelter, utilities) at micro-level}
\]

<table>
<thead>
<tr>
<th>SPM Threshold = FCSU + little bit more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplemental Nutrition Assistance Program (SNAP)</td>
</tr>
<tr>
<td>Housing Subsidies</td>
</tr>
<tr>
<td>National School Lunch Program (NSLP)</td>
</tr>
<tr>
<td>Supplemental Nutrition Program for Women, Infants, and Children (WIC)</td>
</tr>
<tr>
<td>Low-Income Home Energy Assistance (LIHEAP)</td>
</tr>
</tbody>
</table>
Problem: Thresholds and Resources Consistently Defined

Thresholds
- Housing & Energy Subsidies
- Other Food Subsidies
- CE OOP Expenditures for FCSU (including SNAP)

Resources
- Housing & Energy Subsidies
- Other Food Subsidies
- With SNAP In-Kind Benefits
- Cash income

Consistent

Proposed
Challenge: Data in the U.S. Consumer Expenditure Interview Survey

- Expenditures collected: out-of-pocket
- Limited data on Rental Assistance Programs
  - Indicator variables for rented living quarters
    - Is this house a public housing project, that is, it is owned by a local housing authority or other local public agency? (CE variable: pub_hous)
    - Are your housing costs lower because the Federal, State, or local government is paying part of the cost? (CE variable: govtcost)
  - Total rent payments for each of last 3 months (do not include direct payments by local, state, or federal agencies)
  - Expenditures for utilities
- No data on programs but data on potential participants
  - National School Lunch Program (NSLP)
  - Supplemental Nutrition Program for Women, Infants, and Children (WIC)
  - Low income Home Energy Assistance (LIHEAP)
- SNAP implicitly included in reported food expenditures
## Expenditures, In-Kind Benefits, and Resources

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Form of Benefit</th>
<th>Value of Commodity or Service in CE Reported Expenditures?</th>
<th>Commodity or Service Value in Thresholds</th>
<th>In Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAP</td>
<td>EBT cash-value to CU</td>
<td>yes, as food expenditures= full value</td>
<td>OOP</td>
<td>cash value</td>
</tr>
<tr>
<td><strong>Housing Subsidies</strong></td>
<td>Landlord accepts voucher or CU lives in public housing</td>
<td>&lt; full value</td>
<td>OOP+imputed benefit</td>
<td>imputed benefit</td>
</tr>
<tr>
<td>NSLP</td>
<td>Direct payment to school</td>
<td>&lt; full value</td>
<td>OOP+imputed benefit</td>
<td>imputed benefit</td>
</tr>
<tr>
<td>WIC</td>
<td>Voucher paper or EBT for commodities to CU</td>
<td>&lt; full value</td>
<td>OOP+imputed benefit</td>
<td>imputed benefit</td>
</tr>
<tr>
<td>LI HEP</td>
<td>Direct payment to vendor</td>
<td>&lt; full value</td>
<td>OOP+imputed benefit</td>
<td>imputed benefit</td>
</tr>
</tbody>
</table>

**EBT**: Electronic benefit transfers  
Full value could be at recipient or market value
Imputation Approaches

- CPS Binary + FMRs
  - ASEC public use data to impute 0,1 program participation
  - HUD Fair Market Rents (FMR)

- CPS Binary + CE imputed rents
  - ASEC public use data to impute 0, 1 program participation
  - Imputed rents using internal CE data: 2-stage rent model

- Regression-based program participation
- Benefit values assigned to participants based on administrative data excluding CE-based imputed rents
Imputations: Survey Data

- U.S. Consumer Expenditure Survey Interview
  - Consumer unit (CU) level data
  - CU and member characteristics
  - Quarterly data collected 2008Q2 – 2013Q1
  - Rents for unsubsidized, non-rent controlled units + rental unit characteristics

  - Household level data
  - Household and member characteristics
  - Same years as in CE: collected 2009-2013 refers to 2008-2012
  - NSLP, WIC, and LIHEAP reported program participation
Imputations: Benefits Data

- **NSLP: U.S. Department of Agriculture for 2008-2012**
  - Average per school lunch payment rates
    - Over 48 contiguous states plus Hawaii and Alaska
    - Rates for schools in which less than 60% of lunches served were free or reduced priced for all but District of Columbia Louisiana, Mississippi, and New Mexico (60% + with free or reduced, USDEd)
  - Different values (same values for commodities)
    - Free
    - Reduced
    - Student paid full price for lunch (but also subsidized by USDA)

- **WIC: U.S. Department of Agriculture for 2008-2012**
  - Average national monthly values per person

- **LIHEAP: U.S. Department of Health and Human Services for 2009**
  - Average annual benefit levels per household per state adjusted by CPI
  - Benefits
    - Heating
    - Cooling (not all states offer this benefit)

- **Subsidized rents**
  - U.S. Department of Housing and Urban Development 2008-2012 Fair Market Rents (FMRs) matched to CE by Census tract and number of bedrooms
  - Imputed from CE renters not in rent controlled units, not public housing, not rental assistance
FCSU-IK Estimation

- All Consumer Units in 5 years of CE data underlying 2012 SPM thresholds
  - Add in-kind benefits to FCSU out-of-pocket expenditures at CU (micro) level
  - Convert all quarterly expenditures to annual $2012

- Restricted to SPM Thresholds Estimation Sample
  - Apply 3-parameter equivalence scale to convert estimation sample (CUs with 2 children) FCSU to 2A+2C
  - Rank $FCSU^+$ to identify 33rd percentile represented by 30th to 36th percentile range
  - Produce means of $FCSU^+$ and $SU$ by housing status
  - Estimate thresholds for
    - Owners with mortgages
    - Owners without mortgages
    - Renters
## CE-Imputed In-Kind Benefits in Comparison: Aggregates

<table>
<thead>
<tr>
<th>Data Source</th>
<th>NSLP</th>
<th>WI C*</th>
<th>LI HEAP</th>
<th>Rent Subsidies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FMR</td>
</tr>
<tr>
<td>CE Imputed Participation from CPS (5 years of data)</td>
<td>$10.2</td>
<td>$4.6</td>
<td>$1.0</td>
<td>$35.1</td>
</tr>
<tr>
<td>CPS 2012</td>
<td>$10.7</td>
<td>$3.1</td>
<td>$1.6</td>
<td>$40.4</td>
</tr>
<tr>
<td>USDA FY2012</td>
<td></td>
<td>$6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USDA FY2013</td>
<td>$10.8</td>
<td>$6.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USDA 9 months 2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUD+USDA 2012</td>
<td></td>
<td></td>
<td></td>
<td>$43.3</td>
</tr>
<tr>
<td>HHS 2010 in 2012$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating</td>
<td></td>
<td></td>
<td>$2.9</td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td></td>
<td></td>
<td>$0.3</td>
<td></td>
</tr>
</tbody>
</table>

*WIC: CE estimates and USDA based on pre-rebate values for infant food.
# CE-Imputed In-Kind Benefits in Comparison: CU/HH Participation

<table>
<thead>
<tr>
<th>Data Source</th>
<th>NSLP</th>
<th>WIC*</th>
<th>LI HEAP</th>
<th>Rent Subsidies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FMR</td>
</tr>
<tr>
<td>CE Imputed Participation from CPS</td>
<td>19.0%</td>
<td>2.8%</td>
<td>2.2%</td>
<td>4.2%</td>
</tr>
<tr>
<td>(5 years of data)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPS 2012</td>
<td>17.5%</td>
<td>2.8%</td>
<td>3.3%</td>
<td>4.0%</td>
</tr>
<tr>
<td>HHS 2010 in 2012$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating</td>
<td></td>
<td></td>
<td></td>
<td>6.3%</td>
</tr>
<tr>
<td>Cooling</td>
<td></td>
<td></td>
<td></td>
<td>0.8%</td>
</tr>
</tbody>
</table>

*WIC: CE estimates based on pre-rebate values for infant food.
CE-Imputed In-Kind Benefits in Comparison: Annual Average Benefit per CU/HH

<table>
<thead>
<tr>
<th>Data Source</th>
<th>NSLP</th>
<th>WIC*</th>
<th>LI HEAP</th>
<th>Rent Subsidies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FMR</td>
</tr>
<tr>
<td>CE Imputed Participation from CPS</td>
<td>$441</td>
<td>$1,334</td>
<td>$367</td>
<td>$6,926</td>
</tr>
<tr>
<td>(5 years of data)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CPS 2012</td>
<td>$478</td>
<td>$861</td>
<td>$383</td>
<td>$7,675</td>
</tr>
<tr>
<td>HHS 2010 in 2012$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating</td>
<td></td>
<td></td>
<td></td>
<td>$391</td>
</tr>
<tr>
<td>Cooling</td>
<td></td>
<td></td>
<td></td>
<td>$293</td>
</tr>
</tbody>
</table>

*WIC: CE estimates based on pre-rebate values for infant food.
Percent of 2012 Aggregate Dollars Using 5 Years of CE Data

- Food Only, 30.9%
- Clothing, 4.9%
- Shelter & Utilities Only, 62.0%

For SPM Thresholds

- IK = 2.2%
- IK = 4.4%

Aggregates based on CE imputed rent subsidies
Aggregate Shares of In-kind Benefits

All Cus: IK=2.2% of Aggregate

- Rent Subsidy: 75%
- NSLP Free: 6%
- NSLP Reduced: 7%
- NSLP Paid: 3%
- WIC Children: 4%
- WIC Infants: 2%
- WIC Pregnant: 1%
- LI HEAP: 2%

CUs in 30-36th Percentile “2+2”: 4.4% of Aggregate

- Rent Subsidy: 55%
- NSLP Free: 12%
- NSLP Reduced: 12%
- NSLP Paid: 5%
- WIC Children: 10%
- WIC Infants: 10%
- WIC Pregnant: 1%
- LI HEAP: 2%

Aggregates based on CE imputed rent subsidies
Distribution of CUs with IK Benefits

All CUs

- NSLP Free
- NSLP Reduced
- NSLP Paid
- WIC Children
- WIC Infants
- WIC Pregnant
- LIHEAP
- Rent Subsidy

CUs with 2 children in 30-36th

- NSLP Free
- NSLP Reduced
- NSLP Paid
- WIC Children
- WIC Infants
- WIC Pregnant
- LIHEAP
- Rent Subsidy
Recommendations

1. Add in-kind benefits at CUs level to OOP FCSU spending
   - Consistency in threshold and resource definitions
   - Improved SPM thresholds that reflect values of commodities and services “purchased by/made available to” CUs (consumption for all but owner-occupied housing)

2. Use simplest method to reflect participation and valuations, but which?
   - Administrative totals?
   - CPS ASEC aggregates, participation, averages?

3. Continue research on in-kind benefit programs and data availability
   - WIC and LIHEAP cash value components
   - CE imputed rents vs. FMRs
   - Explore possibility of 2 renter thresholds (with and without subsidies)
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