Changing the Housing Share of Poverty Thresholds for the Supplemental Poverty Measure: Does Consumer Unit Size Matter?

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Disclaimer

- This presentation reports the results of research and analysis undertaken by researchers within the Bureau of the Census (Census) and Bureau of Labor Statistics (BLS).
- Any views expressed are those of the authors and not necessarily those of the Census or BLS.
- Results are preliminary and not to be quoted without authors’ permission.
Motivation

- The Supplemental Poverty Measure (SPM) assumes that all SPM resource units within each housing type (renter, owner with a mortgage, owner without a mortgage) devote the same share of their threshold to housing costs. This is important because ...
  - Geographical adjustments applied to only the housing share of threshold
  - Value of housing assistance benefits capped at no greater than housing share of the threshold.

- Concerns about underestimation of the value of housing benefits led to an investigation of this assumption.
  - Should the housing share vary by household size?
Outline

- Background on SPM thresholds, equivalence scales, and housing shares
- Alternative equivalence scales
- Alternative estimates of housing shares
  - ACS data
  - CE data
- Impact on poverty rates
Poverty Concept: Economic Deprivation

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

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

**Poverty Concept:** deprivation based on comparison of resources and consumption “needs”

**Consumption “needs” proxied by spending (or expenditures)**
- NAS Panel assumption: “CE expenditures include housing assistance subsidies (rent and utilities)” ... and “benefits from food stamps and other meals provided free” (paraphrase of NAS Report, 1995, pp. 393-394)
- BUT: CE expenditures only account for food stamps or SNAP
Threshold Estimation... *thus far...*

- Food, clothing, shelter, and utilities (*FCSU*) expenditures
- Consumer Expenditure Interview Survey data: 5 years of data
- *FCSU* “expenditures” in constant year dollars
- Estimation sample: Consumer Units (CUs) with 2 children
- Reference sample: 2 adults with 2 children (3-parameter equivalence scale applied to +2 children FCSU expenditures)
- Rank CUs by their *FCSU* “expenditures”
  - Identify 33rd percentile represented by 30th to 36th percentile range
  - Produce means of *FCSU* and *SU* by housing status
  - Estimate thresholds by housing tenure

- Send to Census Bureau to derive other CU thresholds and make geographic adjustment
Housing Tenure Adjustment

- Since NAS Panel report was issued in 1995, it has become clear that a significant number of low-income families own a home without a mortgage and therefore have quite low shelter expense requirements (see ITWG document, March 2010)

- Not taking this into account may overstate their poverty rates

- Suggests the need to adjust SPM thresholds for housing status, distinguishing renters, owners with a mortgage, and owners without a mortgage.

- There would be THREE thresholds, NOT a single threshold for all.
Consumer Units by Housing Type and Income: 2015

Housing Status Thresholds

- Housing Status Groups, j
  - Owners with mortgages
  - Owners without mortgages
  - Renters

- SPM Threshold\(_j\):

\[
= (1.2 * FCSU_A) - SU_A + SU_j
\]

\(FCSU_A, SU_A, SU_j\) are means within 30\(^{th}\) to 36\(^{th}\) percentile range of FCSU\(_A\) for reference CUs
SPM Reference Unit

Estimation sample: consumer units (CUs) with 2 children
Reference unit: CUs with 2 adults and 2 children
Equivalence Scale Adjustment to Derive 2-Adults with 2-Children SPM Thresholds

- Why make adjustment?
  - Needs of adults and children
  - Economies of scale of FCSU within reference units

- 3-Parameter Equivalence Scale
  - One adult scale = 1
  - Two adult scale = 1.41 \((= \text{adults}^{0.5})\)
  - Single parents scale
    \[= (\text{adults} + 0.8 \times \text{first child} + 0.5 \times \text{other children})^{0.7}\]
  - All other CUs scale
    \[= (\text{adults} + 0.5 \times \text{children})^{0.7}\]
Regression-Based Equivalence Scales

- Basic model:

\[ \ln \text{Exp} = \beta_0 + \beta_1 \ln Y - \beta_2 \ln N + \cdots + \varepsilon \]

- Rearranging predicted values yields an expression for log income share devoted to, for example, housing.

\[ \ln \text{SHARE} = \beta_0 + (\beta_1 - 1) \ln Y - \beta_2 \ln N + \cdots \]

- All else constant, a consumer unit with \( Y_N \) will be equally well-off as a single person with \( Y_1 \) if:

\[ \beta_0 + (\beta_1 - 1) \ln Y_1 + \cdots = \beta_0 + (\beta_1 - 1) \ln Y_N - \beta_2 \ln N + \cdots \]

- Cancelling and rearranging terms yields the single-parameter approximation:

\[ \frac{Y_N}{Y_1} = N^{\frac{\beta_2}{\beta_1 - 1}} \]
### Consumer Unit Size Equivalence Scale Parameters

<table>
<thead>
<tr>
<th></th>
<th>All Housing Types Together</th>
<th>Owners with Mortgages</th>
<th>Owners without Mortgages</th>
<th>Renters</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Parameter Scale</td>
<td>0.569</td>
<td>0.589</td>
<td>0.571</td>
<td>0.665</td>
</tr>
<tr>
<td>Housing</td>
<td>0.000</td>
<td>0.118</td>
<td>0.120</td>
<td>0.286</td>
</tr>
<tr>
<td>Food+Clothing</td>
<td>0.316</td>
<td>0.582</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics, Garner's analysis of internal CE Interview data from 2008Q2 through 2013Q1, four quarters of data for each consumer unit. Three parameter scale based on 1 person=1 adult, 2 people=1 adult+1 child, 3 people=2 adults+1 child, 4 people =2 adults+2 children, 5 people=2 adults+3 children, and 6 people=3 adults+3 children.
2015 SPM Thresholds Based on Different Equivalence Scales: Three-Parameter versus Single Consumer Unit Size Parameter

Source: Bureau of Labor Statistics, Garner’s analysis of internal CE Interview data from 2008Q2 through 2013Q1, four quarters of data for each consumer unit.
Housing Shares: 2015

Housing shares effect two aspects of the SPM calculation:

- Geographic adjustment on only the housing share of the threshold
- Value of housing assistance capped using the housing share of the threshold

Alternative Estimates of Housing Shares

Figure 1. Total Population Housing Costs as a Percent of Income

Figure 2. Housing Costs as a Percent of Income - Households with Income Less than 200 percent of Official Poverty

Source: 2014 American Community Survey Five Year Data. For more information, see census.gov/acs.
Comparing ACS to CE Estimates

Figure 2. Housing Costs as a Percent of Income - Households with Income Less than 200 percent of Official Poverty

- Gross Rent as a Percentage of Household Income
- Selected Monthly Owners Costs as a Percentage of Household Income - Mortgage
- Selected Monthly Owners Costs as a Percentage of Household Income - No Mortgage

Source: 2014 American Community Survey Five Year Data. For more information, see census.gov/acs.

Figure 3. Housing Expenditures as a Percent of the Sum of Food, Clothing, Shelter, Utilities (FCSU), and Other Basic Needs (20%) Expenditures

- Renters
- Owners with Mortgage
- Owners without a Mortgage

Source: Quarterly Consumer Expenditure Survey, all consumer units participating in 2008Q2-2013Q1
Housing Share of SPM Thresholds by Methodology

Source: Authors’ calculations based on ACS 2014 5 year data, shares and alternative equivalence scales derived by Garner from CE data.
Prior research by Renwick and Mitchell on alternative housing shares

- Changed housing shares to 70 percent for one person units; 60 percent for two person units
- Increased effect of housing subsidies on SPM rates.

Source: Renwick and Mitchell, 2015, using 2013 CPS ASEC.
Overall poverty rates

Results: Units with Housing Subsidy

Marginal Impact of Housing Subsidies

Conclusions – Future Research

- While conceptually an interesting question, in practice changing the shares does little to change the impact of housing subsidies on SPM rates.
- Other concerns with estimation of values of housing subsidies more important.
- Need to develop a methodology to validate the existing and/or proposed equivalence scales.
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Extra Slides
CE Operational Definition: Housing (Shelter + Utilities)

- Shelter for primary residence
  - For renters
    - Rents
    - Maintenance and repairs
    - Tenants insurance
  - For owners without mortgages
    - Property taxes
    - Home insurance
    - Maintenance and repairs
  - For owners with mortgages
    - Same as for owners without mortgages plus
    - Mortgage interest
    - Principal repayments
    - (No home equity loans or lines of credit)

- Utilities for primary residence
  - Energy: natural gas, electricity, fuel oil, and other fuels
  - Telephone service
  - Water, sewage, and other public services
CE Weighted Sample for Equivalence Scale Estimation: Distribution of CUs by Housing Type

Owners with Mortgages, 52.1%
Renters, 35.5%
Owners without Mortgages, 12.4%

Renters, 23.6%
Owners with Mortgages, 46.4%
Owners without Mortgages, 30.0%

CUs with Two Children: 2015 Thresholds

Source: Bureau of Labor Statistics, Garner’s analysis of internal CE Interview data from 2008Q2 through 2013Q1, four quarters of data for each consumer unit.

CUs with Two Children within 30-36th Percentile Range: 2015 Thresholds

Owners with Mortgages, 37.1%
Renters, 51.0%
Owners without Mortgages, 11.9%

Source: Bureau of Labor Statistics, Garner’s analysis of internal CE Interview data from 2011Q2 through 2016Q1, quarter independent.
Distribution of CUs by Members by Housing Group

<table>
<thead>
<tr>
<th>CU Size</th>
<th>Owners with Mortgages</th>
<th>Owners without Mortgages</th>
<th>Renters</th>
</tr>
</thead>
<tbody>
<tr>
<td>7+</td>
<td>58.0%</td>
<td>18.6%</td>
<td>23.3%</td>
</tr>
<tr>
<td>6</td>
<td>62.6%</td>
<td>14.9%</td>
<td>22.5%</td>
</tr>
<tr>
<td>5</td>
<td>64.0%</td>
<td>14.3%</td>
<td>21.7%</td>
</tr>
<tr>
<td>4</td>
<td>66.7%</td>
<td>14.4%</td>
<td>18.8%</td>
</tr>
<tr>
<td>3</td>
<td>55.9%</td>
<td>22.7%</td>
<td>21.4%</td>
</tr>
<tr>
<td>2</td>
<td>43.9%</td>
<td>39.4%</td>
<td>16.7%</td>
</tr>
<tr>
<td>1</td>
<td>28.9%</td>
<td>35.7%</td>
<td>35.4%</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics, Garner’s analysis of internal CE Interview data from 2008Q2 through 2013Q1, four quarters of data for each consumer unit.
Source: Bureau of Labor Statistics, Garner’s analysis of internal CE Interview data from 2008Q2 through 2013Q1, four quarters of data for each consumer unit.
Shares of Housing Expenditures by Housing Type

- **Owner with Mortgage**
  - Fuel/water: 18.0%
  - Telephone Ser: 8.4%
  - Mortg+Int: 51.7%
  - Prop Tax, MR, Ins.: 21.7%
  - Rent, MR, Inc.: 14.7%
  - Total: 180.3%

- **Owner without Mortgage**
  - Fuel/water: 15.6%
  - Telephone Ser: 42.9%
  - Mortg+Int: 39.9%
  - Prop Tax, MR, Ins.: 11.6%
  - Rent, MR, Inc.: 15.6%
  - Total: 111.2%

- **Renter**
  - Fuel/water: 10.1%
  - Telephone Ser: 14.7%
  - Mortg+Int: 74.3%
  - Prop Tax, MR, Ins.: 10.1%
  - Rent, MR, Inc.: 10.1%
  - Total: 179.9%

Source: Bureau of Labor Statistics, Garner’s analysis of internal CE Interview data from 2008Q2 through 2013Q1, four quarters of data for each consumer unit.
Average Number of CU Members per Bedroom

<table>
<thead>
<tr>
<th>Consumer Unit Size</th>
<th>Owner with Mortgage</th>
<th>Owner without Mortgage</th>
<th>Renter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.4</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>2</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>3</td>
<td>1.2</td>
<td>1.0</td>
<td>1.2</td>
</tr>
<tr>
<td>4</td>
<td>1.5</td>
<td>1.3</td>
<td>1.5</td>
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<tr>
<td>5</td>
<td>1.7</td>
<td>1.6</td>
<td>1.7</td>
</tr>
<tr>
<td>6</td>
<td>2.0</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>7+</td>
<td>2.2</td>
<td>2.1</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics, Garner’s analysis of internal CE Interview data from 2008Q2 through 2013Q1, four quarters of data for each consumer unit. For housing units with 0 bedrooms but 1 room reported, recoded bedroom to 1 (bathrooms not included).
Unit Size

Place of Residence

Age