The Effect of Aging Out of WIC on Food Insecurity

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Background

- Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)
- Nutrition assistance, education, and health screenings for pregnant, postpartum, and breastfeeding women, infants, and children up through age four
- The income limit is 185 percent of the Federal Poverty Level (FPL)
- National School Lunch Program (NSLP)
- Children enrolled in a public school, non-profit private school, or a residential child care institution are eligible for free or reduced-price school meals
- Income at or below 130 percent of the FPL: Free school meals
- Income between 130 to 185 percent of the FPL: Reduced-price school meals
- Kindergarten Entrance Age Rule
- Most states have statutes to require children to turn five in the year they enter kindergarten.
- Snyder et al. (2019) show that about 70 percent of five-year-old children in the U.S. enrolled in kindergarten or beyond.

Motivation

- Some children who are aging out of WIC will not be able to enroll in kindergarten and thus are not eligible for the NSLP.
- The WIC Act in our Children Act
- Introduced in House attempted to eliminate this gap in 2015
- Extend eligibility for WIC until a child enters kindergarten or reaches his or her sixth birthday.
- Did not make it out of committee

Data: Current Population Survey

- School enrollment supplement (October)
- School enrollment and educational attainment
- Food security supplement (December)
- Annual family income in categories
- Receive WIC benefits during the past 30 days
- Child and household food security status, 30-day recall

Sample

- Children from households with income below 185 percent of the FPL
- Group W
- Group I
- Four-year-old children
- Five-year-old children who do not enroll in full-day kindergarten or beyond

Empirical Model

- The partial identification method addresses the dual identification challenges of endogenous self-selection of households into WIC and systematic underreporting of program participation.
- Let D* denote treatment assignment; D* = 1 indicates that children receive WIC and D* = 0 indicates that they do not.
- Coefficient of Interest
  \[ \beta = P[Y(D^* = 1) = 1 | \text{Group I}] - P[Y(D^* = 0) = 1 | \text{Group I}] \]
  where Y (D*) denotes the potential outcomes from treatment D*.
  The potential outcome is 1 if the children are food secure and 0 if the children are food insecure.
- Since all the children from Group I do not receive WIC benefits, the counterfactual terms P[Y (1) = 1 | \text{Group I}] cannot be identified. To address the problem, I assume that the average food security status in Group I and Group W is the same if they receive WIC benefits.
- Under this assumption, the coefficient of interest can be written as
  \[ \beta = P[Y(1) = 1 | \text{Group W}] - P[Y(0) = 1 | \text{Group I}] \]
- Three monotonicity assumptions are imposed to tighten bounds.
  1. Monotone Treatment Selection (MTS) assumption
     \[ P[Y(i) = 1 | \text{Group W}, D^* = 0] \geq P[Y(i) = 1 | \text{Group W}, D^* = 1] \]
     for i = 0, 1
  2. Monotone Treatment Response (MTR) assumption
     \[ P[Y(1) = 1 | D^* = j] \geq P[Y(0) = 1 | D^* = j] \]
     for j = 0, 1
  3. Monotone Instrumental Variable (MIV) assumption
     Let v be household’s income relative to the FPL.
     \[ u_1 \leq v \leq u_2 \Rightarrow P[Y(1) = 1 | \text{Group W}, v = u_1] \leq P[Y(1) = 1 | \text{Group W}, v = u_2] \]
- Two assumptions regarding underreporting of program participation are imposed to tighten bounds.
  1. No false positives assumption
     Reported WIC participation status is only trusted for the respondents who claim to receive WIC benefits.
  2. Error independence assumption
     False reports arise independently of food security status.

Results: WIC Misclassification

<table>
<thead>
<tr>
<th>Year</th>
<th>Group W</th>
<th>Group I</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>32.7</td>
<td>35.9</td>
</tr>
<tr>
<td>2008</td>
<td>34.5</td>
<td>39.1</td>
</tr>
<tr>
<td>2010</td>
<td>35.5</td>
<td>39.1</td>
</tr>
<tr>
<td>2012</td>
<td>25.9</td>
<td>29.9</td>
</tr>
<tr>
<td>2014</td>
<td>26.5</td>
<td>30.5</td>
</tr>
<tr>
<td>2016</td>
<td>20.0</td>
<td>24.0</td>
</tr>
</tbody>
</table>

Note: Yes and No indicate the participation in each program.

Results: Joint MIV-MTS Assumption

- The following empirical results summarize the most preferred model, joint MIV-MTS assumption with the no false positives and the error independence model.
- P[Y(0) = 0 | \text{Group I}] indicates the estimated food insecurity rates of five-year-old children who do not enroll in full-day kindergarten or beyond. The rates are the weighted average of P[Y(0) = 0] across all the cells utilized in the joint MIV-MTS assumption.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Child food security</td>
<td>0.013</td>
<td>0.012</td>
<td>0.011</td>
<td>0.010</td>
<td>0.009</td>
<td>0.008</td>
</tr>
<tr>
<td>House food security</td>
<td>0.013</td>
<td>0.012</td>
<td>0.011</td>
<td>0.010</td>
<td>0.009</td>
<td>0.008</td>
</tr>
</tbody>
</table>

Results: WIC Improvement

- Two different reports published by the United States Department of Agriculture are utilized to estimate the degree of WIC misclassification.
- From 2006 to 2016, the degree of WIC misclassification ranges from 2.3 to 4.0 percentage points.

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