

Food Stamps and Food Insecurity Among  
Families with Children:  
What Can be Learned in the Presence of  
Nonclassical Measurement Error?

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# Food Stamps and Food Insecurity

- The Food Stamp Program is
  - “...the most critical component of the safety net against hunger because it provides basic protection for citizens of all ages and household status.”
- Food Insecurity
  - well established measure to ascertain the effectiveness of the Food Stamp Program in meeting this goal

# Paradox

- Households receiving food stamps are more likely to be food insecure than eligible households not receiving food stamps
  - in 2003, households reportedly receiving food stamps were 17.8 percentage points more likely to be food insecure than households reportedly not receiving food stamps
- Has been ascribed to
  - adverse selection
  - timing of food stamp participation decision
  - misreporting of food stamp participation status
  - misreporting of food insecurity status

# Misreporting of Food Stamp Program Participation

- Aggregate data
  - within the Core Food Security Module (CFSM), weighted count of participants is about 85 percent of administrative data
- Matched administrative and survey data
  - approximately the same extent of misreporting
  - most cases are errors of omission

# Misreporting of Food Insecurity Status

- Reasons
  - worried that to report being food secure will lead to loss of food stamp benefits
  - embarrassed to report being food insecure

# Data

- Current Population Survey (CPS)
  - source of official food insecurity numbers for the U.S.
  - for 2003, in December Supplement
  - contains information on
    - food insecurity (via the CFISM)
    - food stamp participation

# Defining Food Insecurity in the U. S.

- A household is defined as food insecure if it faces limited or uncertain availability of nutritionally adequate and safe foods or uncertain ability to acquire acceptable foods in socially acceptable ways
- Examples of questions used to establish if a household is food insecure
  - “I worried whether our food would run out before we got money to buy more”
  - “Did you or the other adults in your household ever cut the size of your meals or skip meals because there wasn’t enough money for food”
  - “Were you ever hungry but did not eat because you couldn’t afford enough food”
  - “Did a child in the household ever not eat for a full day because you couldn’t afford enough food”
- A household is
  - food secure if 2 or fewer affirmative responses
  - food insecure if 3 or more affirmative responses

# Food Stamp Program

- Primary goals are to alleviate hunger and improve the well-being of poor people
- Fully implemented on nationwide basis in 1974
- USDA issues food stamps to families (via Electronic Benefit Transfer (EBT) cards) which can be used in retail food outlets
- Benefit levels
  - function of income and family size
  - maximum benefit level is \$471 for a family of four
- About 25.7 million people receive food stamps in any month, half of whom are children
- Average benefit level is \$92.70 per person per month

# Eligibility Criteria for Food Stamps

- Gross income test
  - gross income less than 130 percent of the poverty line (\$1628 for a family of three)
- Net income test
  - net income (after various deductions) less than the poverty line (\$1252 for a family of three)
- Asset test
  - less than \$2,000
- Reasons for non-participation
  - stigma
  - transactions costs
  - low benefit levels

# Identification

$$\Delta = P(FI=1|FSP=1) - P(FI=1|FSP=0)$$

FI=1 if a household is truly food insecure,  
0 otherwise

FSP=1 if a household truly receives food  
stamps, 0 otherwise

We observe  $FSP_R$ , reported food stamp  
participation

Let  $Z=1$  if  $FSP_R = FSP$ ,  $Z=0$  otherwise  
(unobserved)

# Identification

$$P(\text{FI} = 1 \mid \text{FSP} = 1) = \frac{P(\text{FI} = 1, \text{FSP} = 1)}{P(\text{FSP} = 1)}$$

$$\theta_1^+ \equiv P(\text{FI}=1, \text{FSP}_R=1, Z=0)$$

- false positives among food insecure households

$$\theta_1^- \equiv P(\text{FI}=1, \text{FSP}_R=0, Z=0)$$

- false negatives among food insecure households

$$\theta_0^+ \equiv P(\text{FI}=0, \text{FSP}_R=1, Z=0)$$

- false positives among food secure households

$$\theta_0^- \equiv P(\text{FI}=0, \text{FSP}_R=0, Z=0)$$

- false negatives among food secure households

$$P(\text{FI} = 1 \mid \text{FSP} = 1) = \frac{P(\text{FI} = 1, \text{FSP}_R = 1) + \theta_1^- - \theta_1^+}{P(\text{FSP}_R = 1) + (\theta_1^- + \theta_0^-) - (\theta_1^+ + \theta_0^+)}$$

# To Narrow Bounds

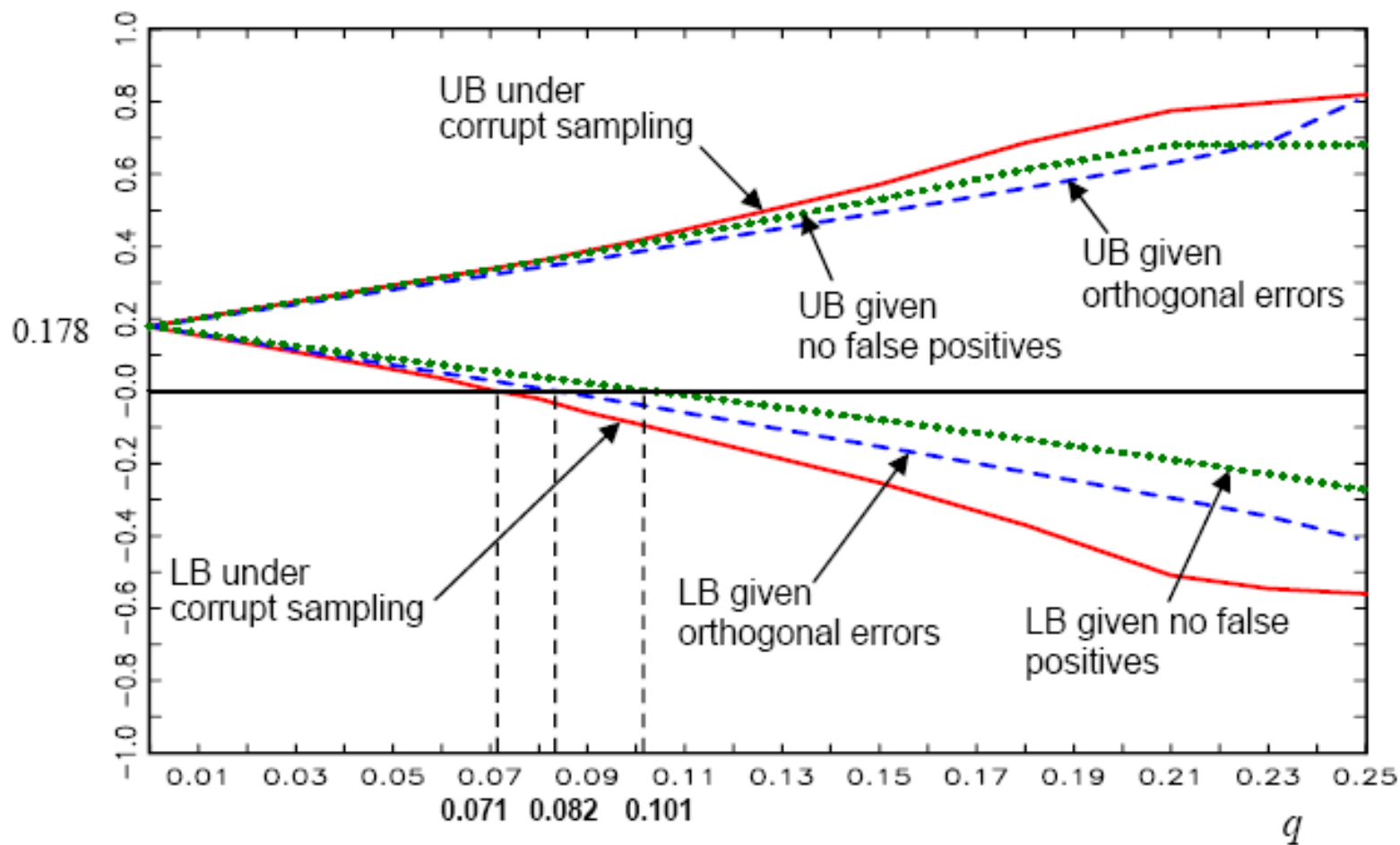
- Place assumptions on reporting errors
  - Corrupt sampling
    - no assumptions are made about the patterns of misreporting
  - Orthogonal errors
    - $P(\text{FSP}=1|Z=1)=P(\text{FSP}=1|Z=0)$
  - No false positive classifications

# Sharp Bounds on the Difference in Food Insecurity Prevalence Rates Between Food Stamp Recipients and Nonrecipients (Among Eligible Households with Children)

Fully Accurate Reporting of Food Insecurity Status,  
Potentially Misclassified Food Stamp Recipieny

Difference in Food Insecurity  
Prevalence Rates ( $\Delta$ )

A. Food Insecurity



# Concluding Remarks

- Under even small degrees of misreporting, the higher food insecurity rate among food stamp participants compared with eligible food stamp non-participants households is not identified:
  - if more than 10.1% of sample misreports food stamp participation status
    - if further allow up to 5% of sample to misreport food insecurity status, if more than 4.1% of the sample misreports food stamp participation status
- Thus, the paradox of the relationship between food stamps and food insecurity hinges on the assumption of very low rates of food stamp misreporting