Alternative Estimates of Income and Poverty in the United States: A Blueprint for Change

Trudi Renwick
Assistant Division Chief for Economic Characteristics
Social, Economic and Housing Statistics Division
U.S. Census Bureau

August 2, 2018

Disclaimer: This presentation is released to inform interested parties of research and to encourage discussion. The views expressed are those of the authors and not necessarily those of the U.S. Census Bureau

United States Census Bureau
U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
census.gov

Motivation

- Each September Census Bureau publishes income and poverty estimates from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) and the American Community Survey (ACS).
- These estimates are widely disseminated and used throughout the year by government, media and researchers.
- BUT they are also criticized for not taking into account underreporting.
  - Meyer, Mok and Sullivan (2015) report that roughly half of dollars received through food stamps, Temporary Assistance for Needy Families and Workers' Compensation have not been reported in the CPS ASEC.
  - We acknowledge these issues in the "official" report but the Census Bureau has not regularly produced alternative estimates.
- Others concerned about quality of imputations, particularly in context of decreasing response rates

Adjustment Strategies

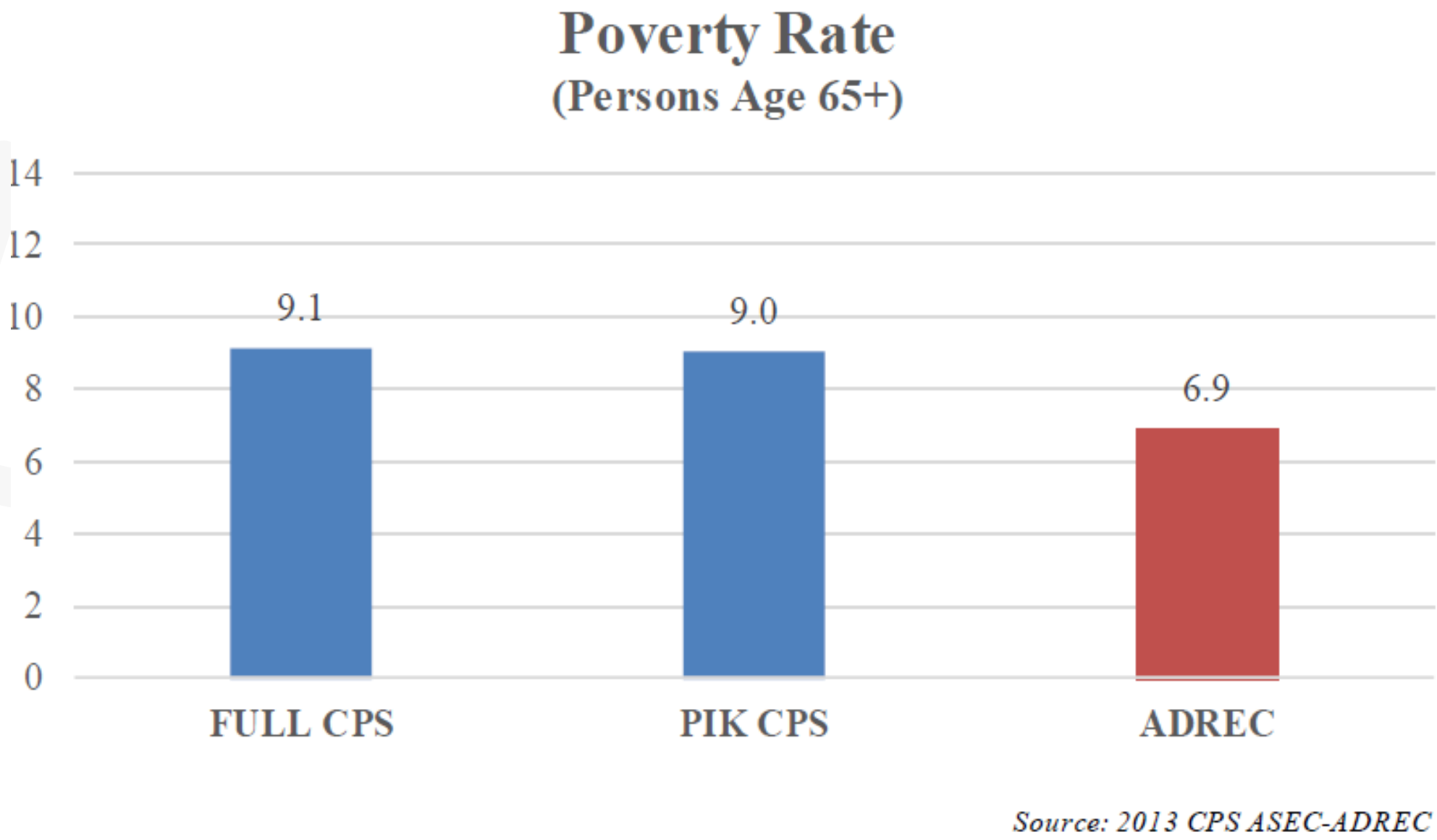
- Rule-based methods: The Transfer Income Model, version 3 (TRIM3) is a comprehensive static microsimulation that is developed and maintained at the Urban Institute, with primary funding from the Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. TRIM3 simulates the major governmental tax, benefit, and health insurance programs that affect the U.S. .population.
- Administrative records: linking survey respondents to IRS, Social Security and other administrative records enable us to replace survey reports with administrative reports for key income sources and benefit programs.
- Regression methods: Sequential Regression Multiple Imputation (SRMI) used to improve imputations; CBO using regression methods to correct for underreporting.

TRIM

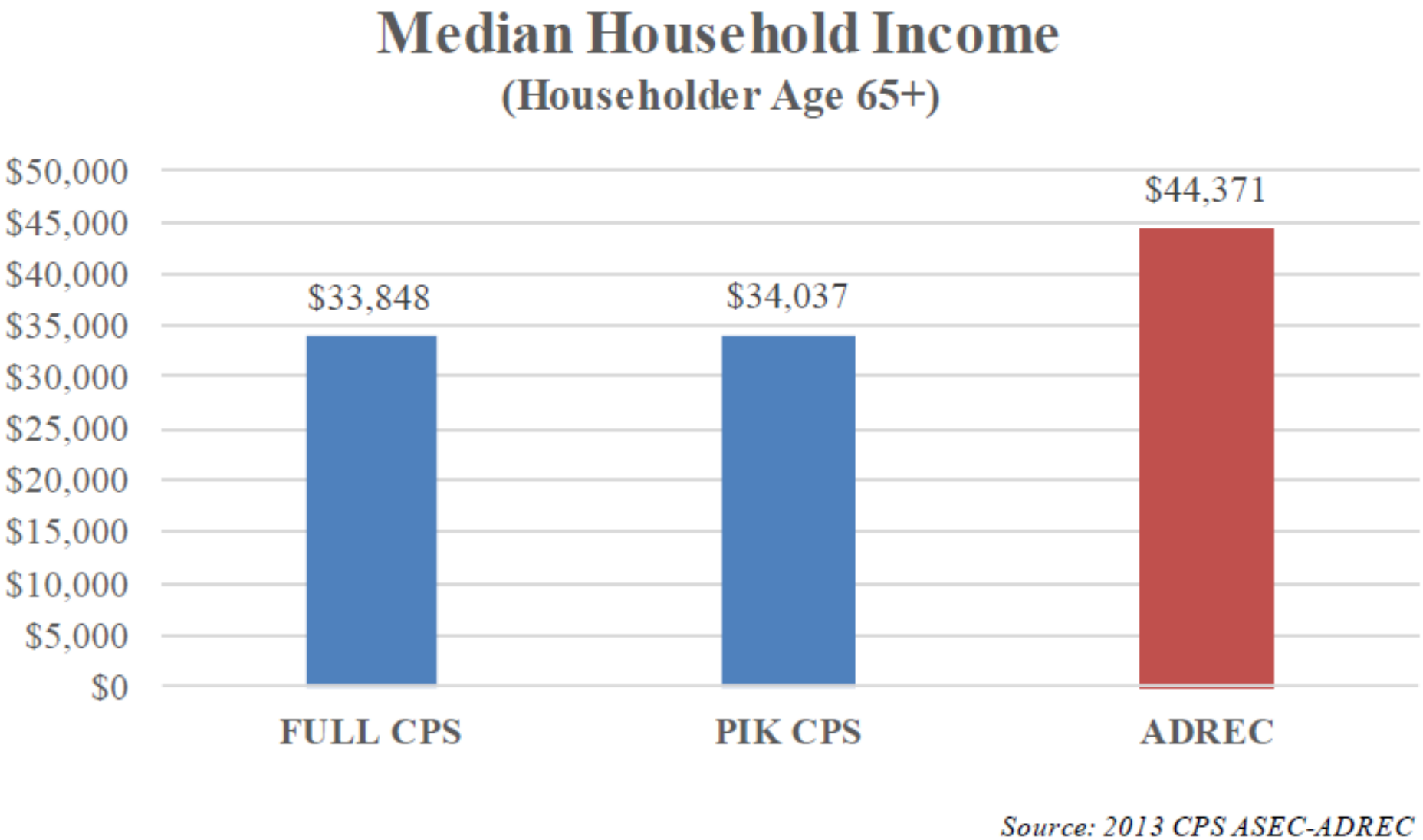
- Urban Institute estimates that correcting cash income for underreporting (public assistance and SSI) reduces official poverty for 2012 from 15.0 percent to 14.8 percent:
  - Child poverty reduced from 21.8 percent to 21.3 percent
  - Poverty for persons 65 and older reduced from 9.1 percent to 8.9 percent
  - Differential between TRIM and official estimates steady since 2008: about 0.2 percentage points.
- Urban Institute estimates that correcting cash income AND major benefit programs reduces SPM poverty for 2015 from 14.5 percent to 12. 8 percent:
  - Correcting cash income reduces SPM poverty estimates from 14.5 percent to 13.9 percent
  - Noncash adjustments (SNAP, WIC, LIHEAP) bring SPM rate down to 12.7 percent
  - Other adjustments (Housing Child Care Expenses, Taxes and Tax Credits) push up SPM rate to 12.8 percent.
- Shaefer and Edin (2018) find that TRIM adjustments reduced number of children in annual $2-a-day poverty in 2012 from 1.3 million to 704,000. HOWEVER – they find that the change in the number of such children between 1995 and 2012 increases from 102 percent with unadjusted CPS ASEC data to 748 percent with TRIM adjustments.

Replace Survey Reports with Administrative Data

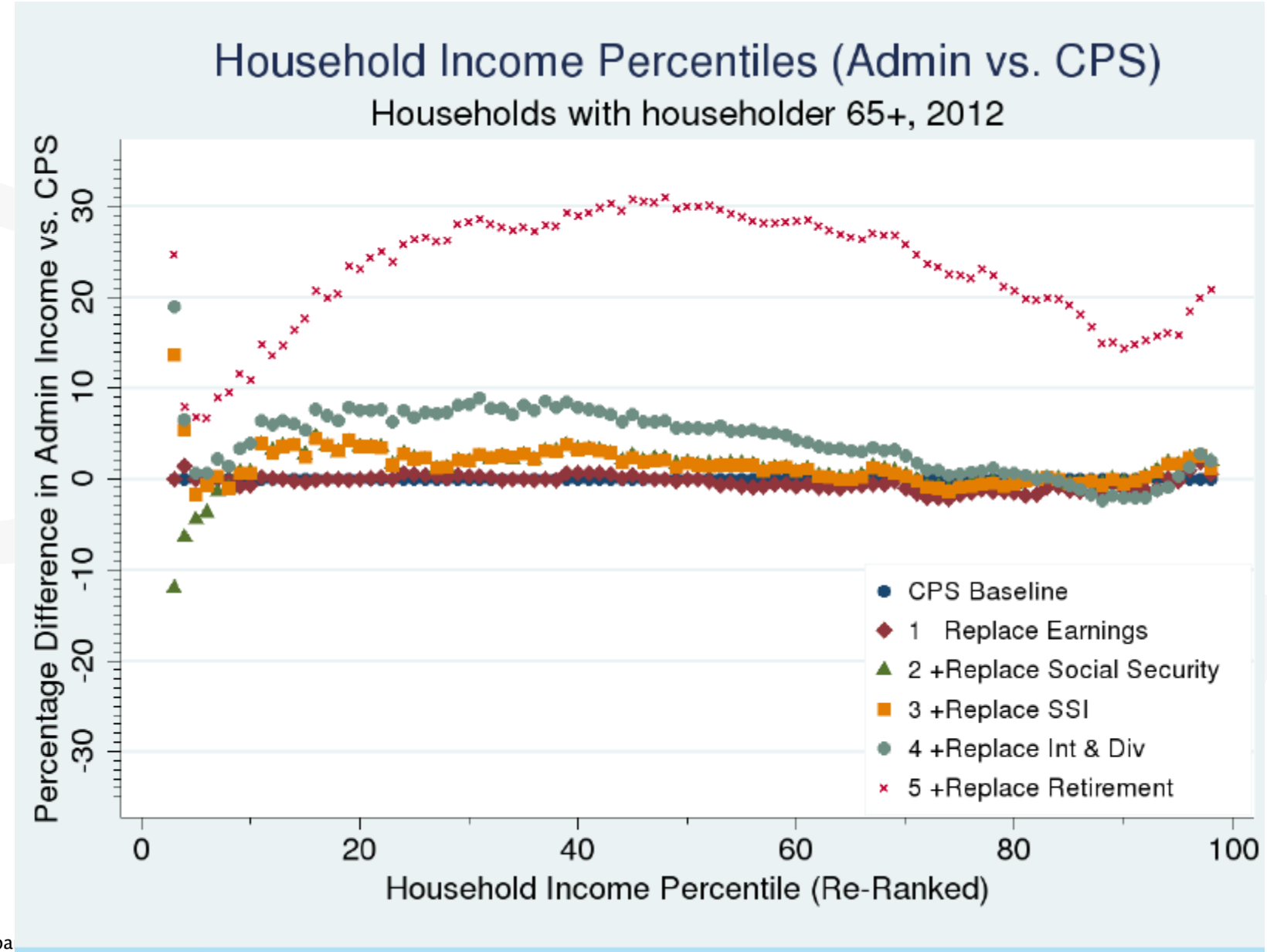
- Bee and Mitchell (2017): income from a variety of sources for 65+ individuals
  - Earnings, Social Security, Supplemental Security Income, Dividends and Interest and Other Retirement Income
  - Data from the IRS:
    - Form 1040 for total dividend income, taxable and tax-exempt interest income
    - Form 1099-R for gross distributions from pensions, annuities, retirement or profit-sharing plans, IRAs etc. (DB and DC income) – includes non-filers.
  - Data from the Social Security Administration
    - Earnings from all W-2 jobs and Self-employment, OASDI Benefits, SSI Benefits
- Stevens, Fox and Heggeness (2018)
  - SNAP benefits for Arizona, Idaho, Illinois, Maryland, Oregon, Tennessee and Virginia



Source: Bee and Mitchell (2017)

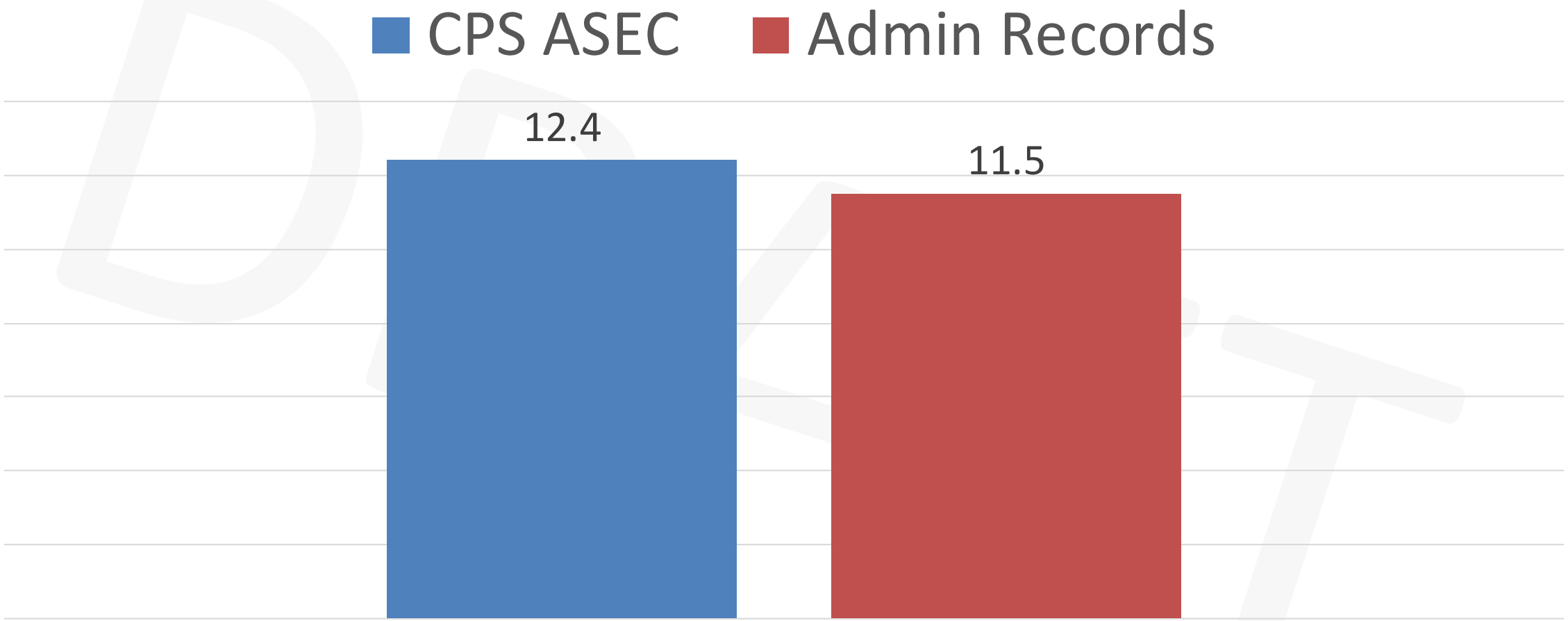


Source: Bee and Mitchell (2017)



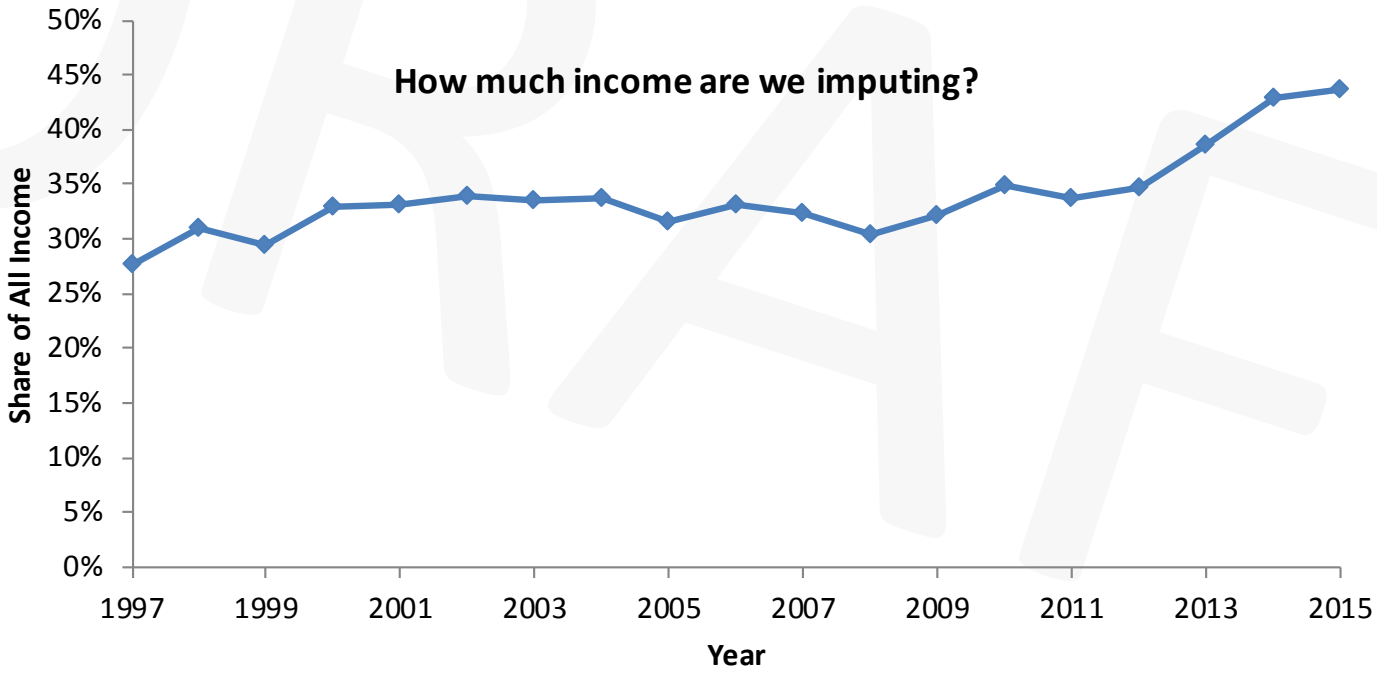
Source: Bee and Mitchell (2017)

Supplemental Poverty Measure Rates: Reported SNAP benefits vs. SNAP benefits from administrative records



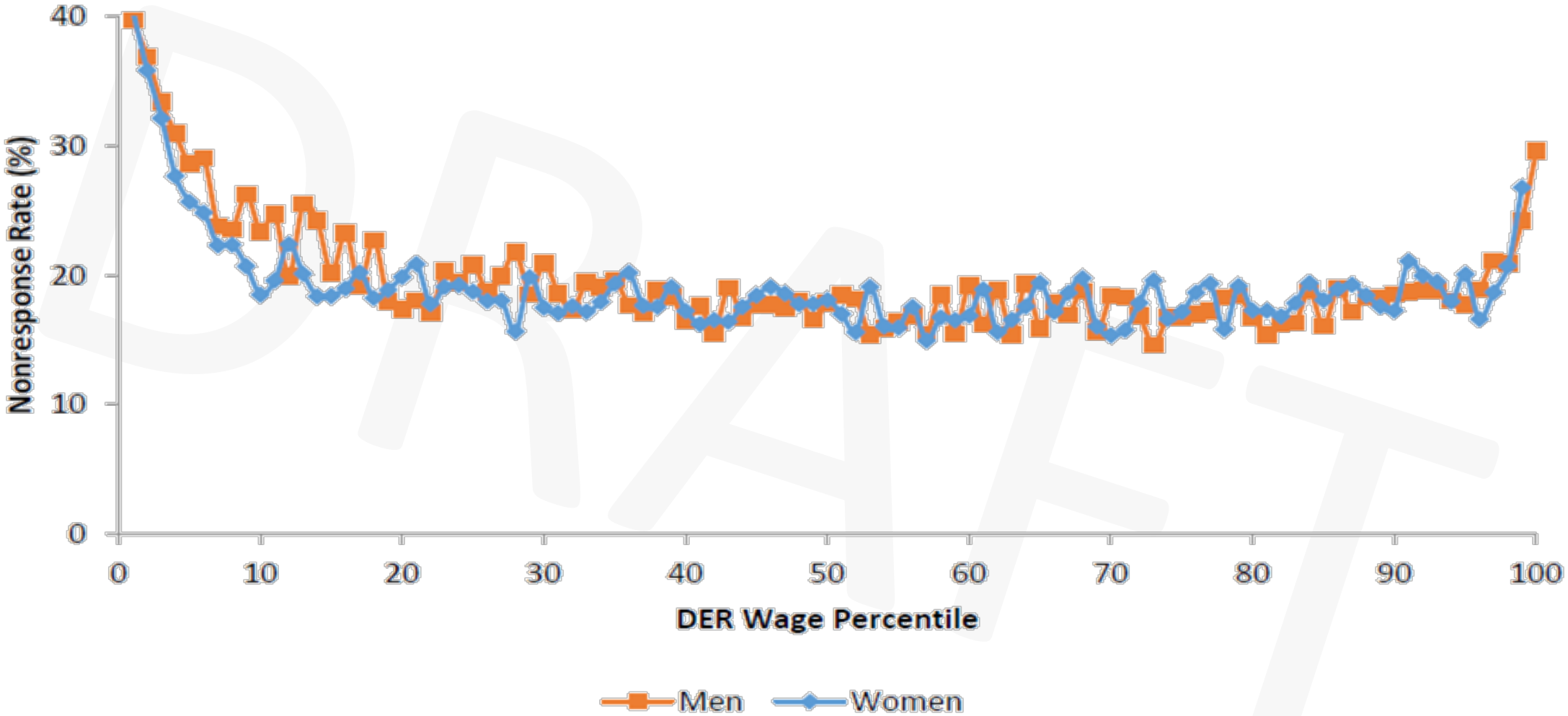
Source: Stevens, Fox and Heggeness (2018)

Improve Imputations: Importance of imputations increase as response rates decline.



Source: Rothbaum calculation from the CPS ASEC

Evidence that Nonresponse Rates Vary Across the Income Distribution: Trouble in the Tails

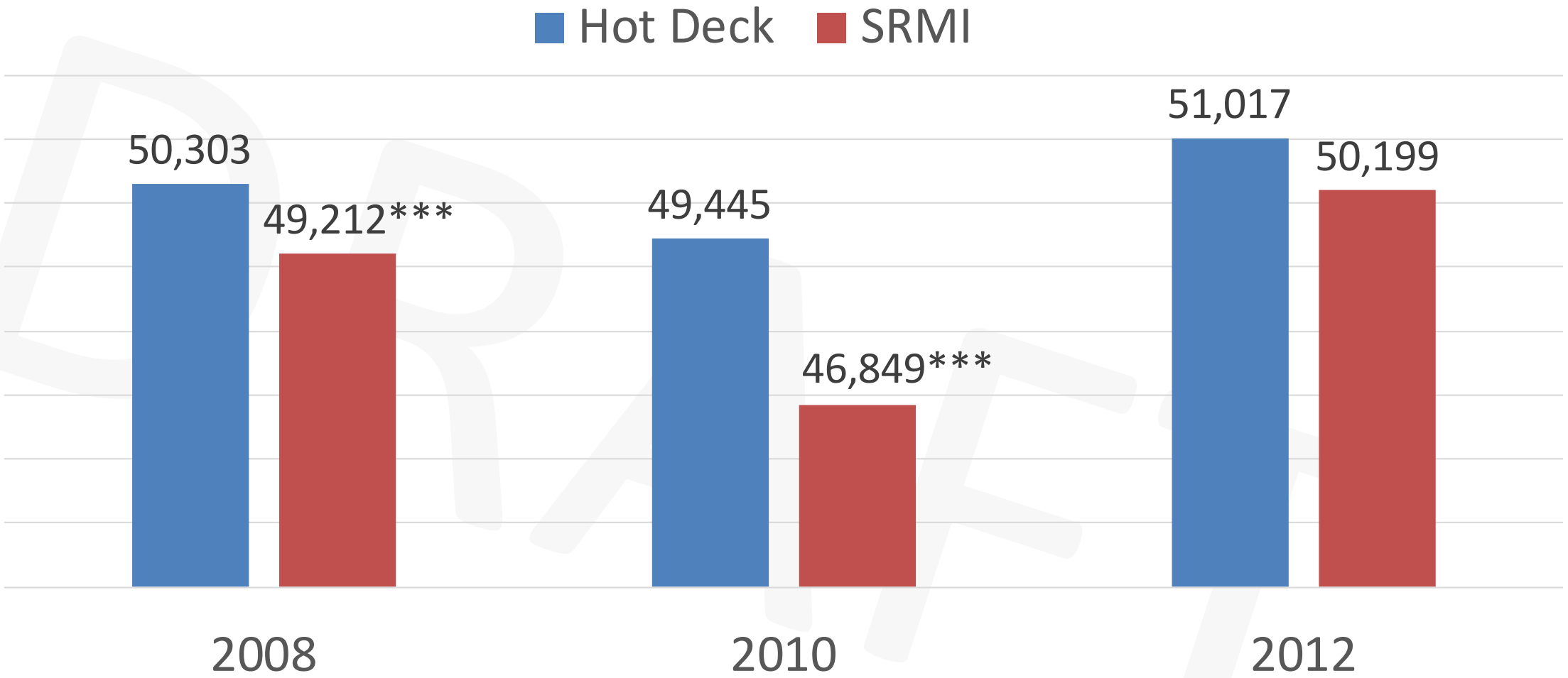


Source: Bollinger et al. (2015) from CPS ASEC linked to W2 records

Sequential Regression Multivariate Imputation (SRMI) using Regression Models

- SRMI
  - Flexible imputation technique
  - Fixes issue of sequential imputation
    - Another source of match bias – cannot condition on Y_2 in model for Y_1 with current approach
- Regression Models
  - Allow inclusion of additional variables in model to address match bias

Median Household Income



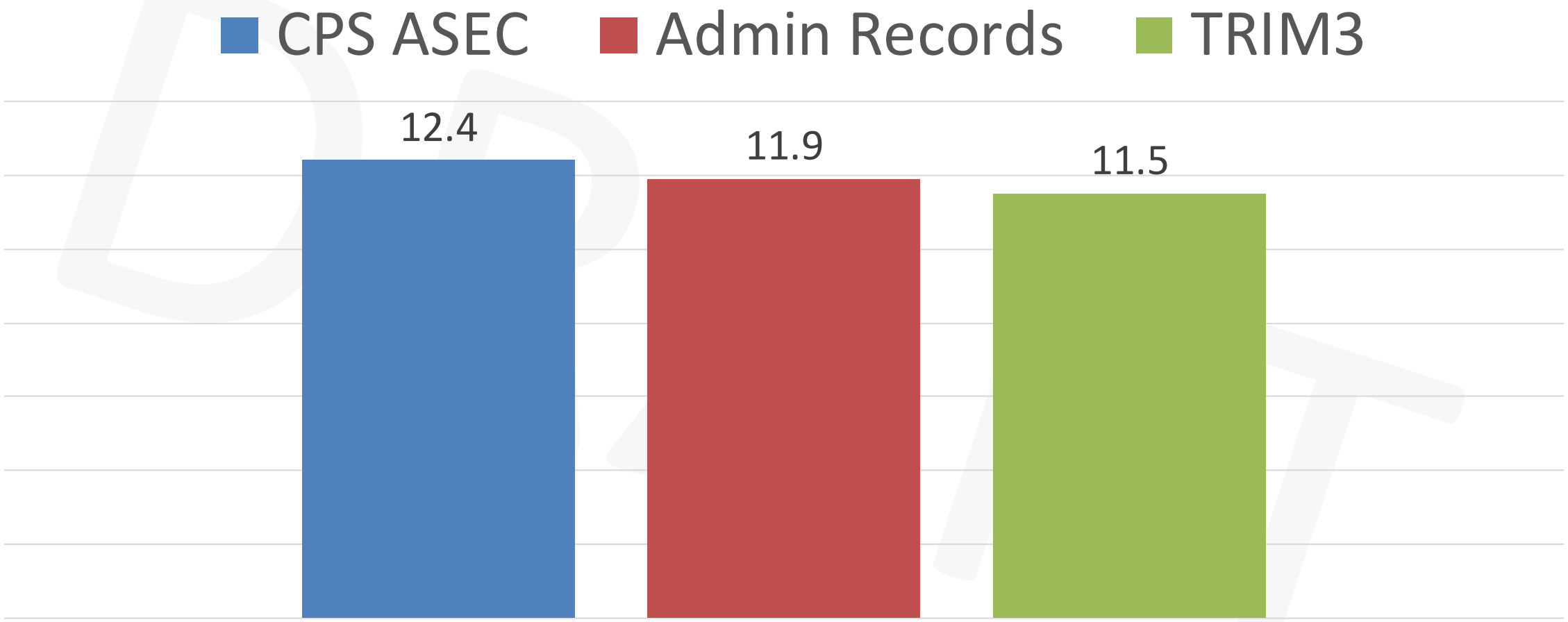
Asterisks are for statistical significance compared to the Hot Deck (*** at 0.01 level, ** at 0.05 level, and * at 0.1 level).
SRMI standard errors incorporate multiple imputation uncertainty. However, hot deck standard errors do not.

Source: Hokayem et al. (2018)

Combining Several Methods

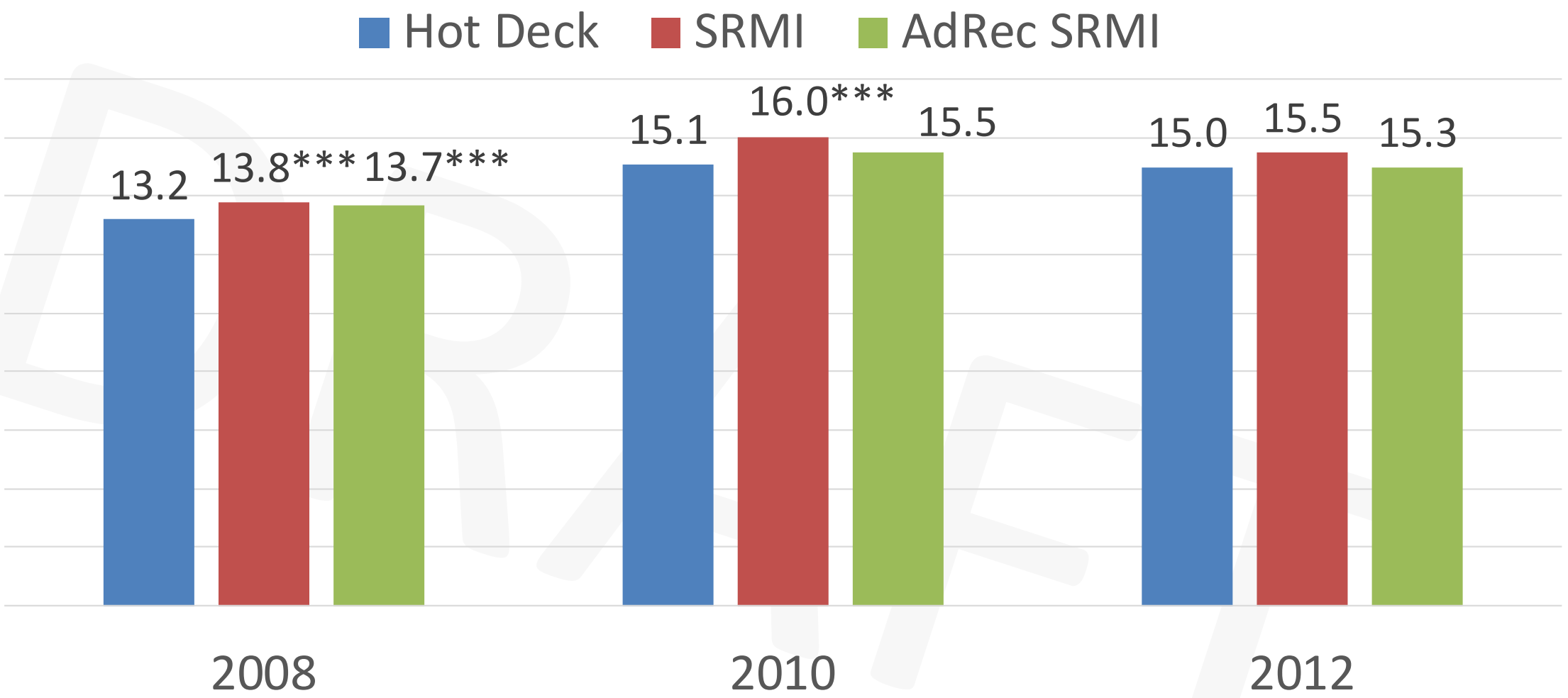
- Stevens, et al., use administrative records to evaluate TRIM
- Rothbaum, et al., use administrative records to do SRMI imputations:
  - Impact on estimates not statistically significant
  - Improves precision of estimates
- Ideally – use all three to get the best estimates:
  - Replace reported income and benefit amounts with administrative data
    - Particularly promising for Social Security, SSI, retirement, interest and dividends
    - Problematic for earnings (80% of income) given many sources of measurement error in administrative earnings records
    - Challenges when data needs to be provided by the states
  - Improve imputations for nonmatches with enhanced techniques
  - Use TRIM to match administrative targets for income sources without administrative records

Supplemental Poverty Measure Rates



Source: Stevens, Fox and Heggeness (2018)

Poverty Rates



Asterisks are for statistical significance compared to the Hot Deck (*** at 0.01 level, ** at 0.05 level, and * at 0.1 level). No differences between SRMI and Adrec S are statistically significant. SRMI and Adrec SRMI standard errors incorporate multiple imputation uncertainty. However, hot deck standard errors do not.

Source: Hokayem et al. (2018)

Challenges

- Can we combine strategies?
  - Need to have in-house version of TRIM3
  - Not clear disclosure review board would allow public use data sets when survey reports are replaced with administrative data
- Timeliness – lag between release of initial estimates and adjusted estimates
  - IRS data delivered monthly but not always complete
  - 12-15 month lag for TRIM3 to update model
  - 36 months?
- Modeling – can we gain public acceptance of statistical modeling to enhance survey estimates?

References

Bee, Adam and Joshua Mitchell. 2017. "Do Older Americans Have More Income Than We Think?". SEHSD Working Paper #2017-39

Bollinger, Christopher R., Barry T. Hirsch, Charles Hokayem, and James P. Ziliak. 2015. Revised February 2018. "Trouble in the Tails? What We Know about Earnings Nonresponse Thirty Years after Lillard, Smith, and Welch."

Hokayem, Charles, Trivellore Raghunathan and Jonathan Rothbaum. 2018. "Match Bias or Nonignorable Nonresponse? Improved Imputation and Administrative Data in the CPS ASEC, Presentation for the IRS-Census Workshop.

Meyer, Bruce D., Wallace Mok, and James X. Sullivan. 2015. "Household Surveys in Crisis ." NBER Working Paper No. 21399.

Shaefer, H.Luke and Kathryn Edin. 2018. "Welfare Reform and the Families It Left Behind." Pathways: 23-27.

Stevens, Kathryn, Liana Fox and Misty Heggeness. 2018. "**Precision in Measurement: Using State-Level SNAP Administrative Records and the Transfer Income Model (TRIM3) to Evaluate Poverty Measurement."** SEHSD Working Paper #2018-15.

Wheaton, Laura and Victoria Tran. 2018. "The Anti-Poverty Effects of the Supplemental Nutrition Assistance Program," Urban Institute.

Contact Information

- Trudi Renwick
  - Trudi.j.renwick@census.gov
  - 301-763-5133
  - Census.gov