
**THE LEVELS AND TRENDS IN DEEP AND EXTREME POVERTY IN THE U.S., 1993-
2016***

David Brady
University of California, Riverside & WZB Berlin Social Science Center

Zachary Parolin
Columbia University

Forthcoming at *Demography*

November 10, 2019

Online Appendix

Section 2. Summary of Problems with Official U.S. Measure of Poverty (OPM).

We encourage skepticism of any estimates based on the OPM. The OPM has serious validity and reliability problems that have been well-documented (e.g. Brady 2009; Brady et al. 2013; Fox et al. 2015a, 2015b; Iceland 2005; Katz 1989; O'Connor 2001; Rainwater and Smeeding 2003; Smeeding 2016). In fact, the impetus for the Supplemental Poverty Measure (SPM) was the widespread knowledge of the deep limitations of the OPM (Fox et al. 2015a, 2015b; Iceland 2005; Wimer et al. 2017).

A careful study of the historical research shows that the OPM was problematic from the beginning. The OPM is often attributed to Orshansky. However, because problems with the OPM were known soon after its implementation, Orshansky herself disavowed the OPM only a few years after it was adopted (Brady 2009; O'Connor 2001). O'Connor (2001: 184) explains, "No one was more surprised, though, than Orshansky herself, who had never meant her measures as official government standards. Concerned primarily with suggesting a way to vary the measure for family size, Orshansky took pains to recognize that her work was at best an 'interim standard,' 'arbitrary, but not unreasonable,' and minimalistic at best." Katz (1989: 116) quotes Orshansky as writing, "'The best that can be said of the measure,' she wrote, 'is that at a time when seemed useful, it was there.'"

We elaborate on two major problems that are particularly relevant to this study. In addition, unlike the SPM and our measures based on state-year medians, the OPM is held constant across the entire U.S., which further undermines reliability.

1) *The Standard of Needs and Threshold*

Despite popular impressions, the standard of needs underlying the OPM does not actually have a clear scientific basis (Brady 2009; Katz 1989; O'Connor 2001). There was never much scientific basis for multiplying food times three. Using data from the mid-1950s, there was evidence that food amounted to roughly one-third of expenses for typical households on average. The evidence was not clear that this applied to low-income households. Further, the Johnson administration ended up using the "economy food plan", which was about 25% below the "low-cost food budget" used by Orshansky (Katz 1989). The economy food plan was meant for emergencies and on a temporary basis. Also, the food budgets were not subsequently revised. A few years later, the government began updating the OPM thresholds using the consumer price index rather than calibrating the thresholds according to changing food budgets. This had the consequence of severing any tie to the food budget as a standard of needs. Indeed, Katz (1989: 116) quotes Orshansky as writing: "This meant, of course, that the food-income relationship which was the basis for the original poverty measure no longer was the current rationale." Moreover, and as is well known, food is certainly much less than 1/3rd of HH expenses today. As a result, the OPM effectively ignores the costs of important household needs like childcare and healthcare, which were less essential or much cheaper when the OPM was created.

2) *The Definition of Income*

The definition of income used in the OPM ignores taxes, tax credits (e.g. the EITC), and near-cash transfers (e.g. SNAP) that we include. As noted above, the EITC and SNAP have grown substantially in recent decades and far more receive either the EITC or SNAP than TANF (Danziger 2010; Moffitt 2015). Also, while the OPM includes Social Security transfers (e.g. Old Age Survivors Insurance and Unemployment Insurance), it ignores childcare vouchers, housing subsidies, any state taxes, and state and federal payroll taxes. Comparisons over time, across

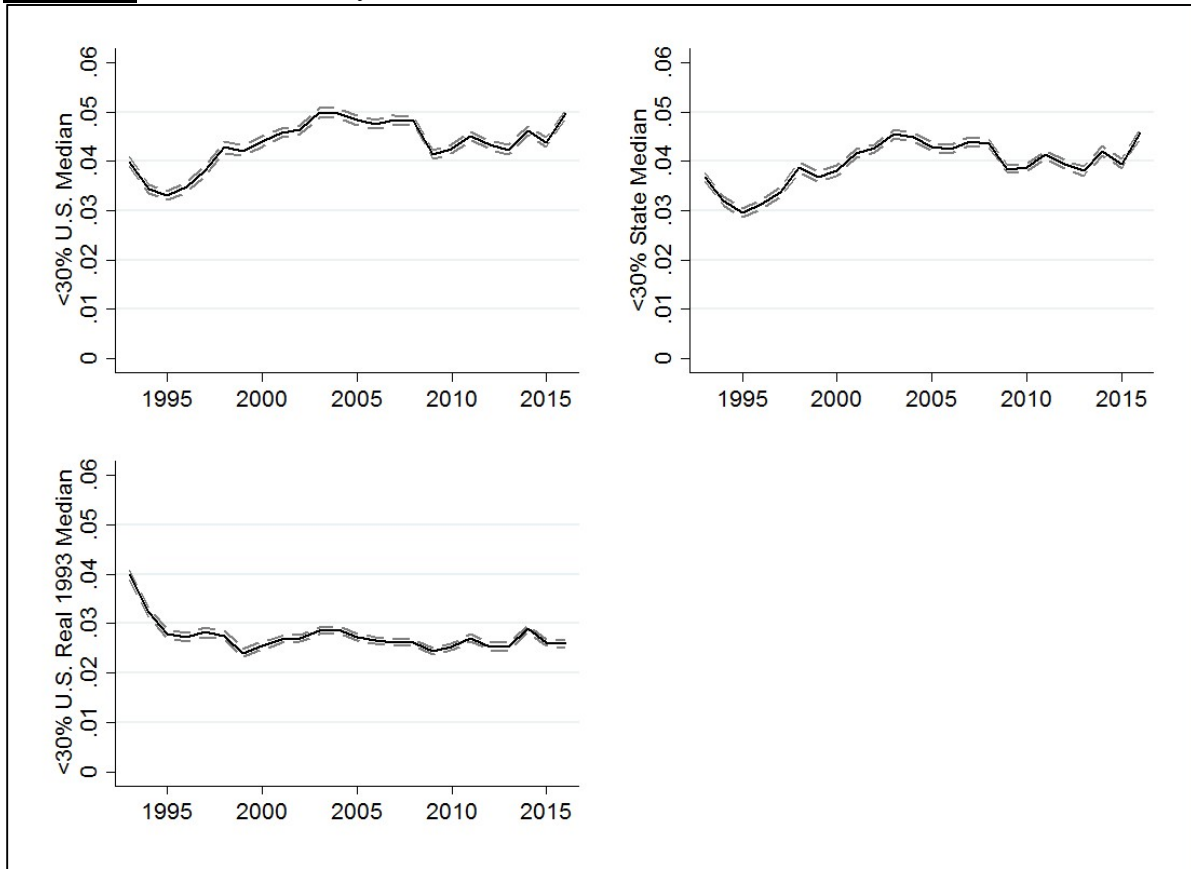
states, and between age groups are therefore quite problematic. As our more comprehensive measure of income incorporates all taxes and transfers, it is inappropriate for us to utilize the OPM threshold with our income definition. For comparison, 50% of the OPM in 2015 would range from \$5,555 (for a single adult) to \$11,445 (for a family of four with two children) in 2018 real dollars. This translates to thresholds of \$5,555 - \$5,722 in equivalized HH income. That the OPM deep poverty thresholds in equivalized HH income differ depending on whether there are one or three people in the HH also illustrates how the OPM equivalence scale is not consistent. As others have shown, the OPM equivalence scale also did not have a scientific basis either (Brady 2009; Katz 1989; O'Connor 2001). Hence, as Appendix I shows, the OPM thresholds for deep poverty are lower than 20% of the national median.

Additional References:

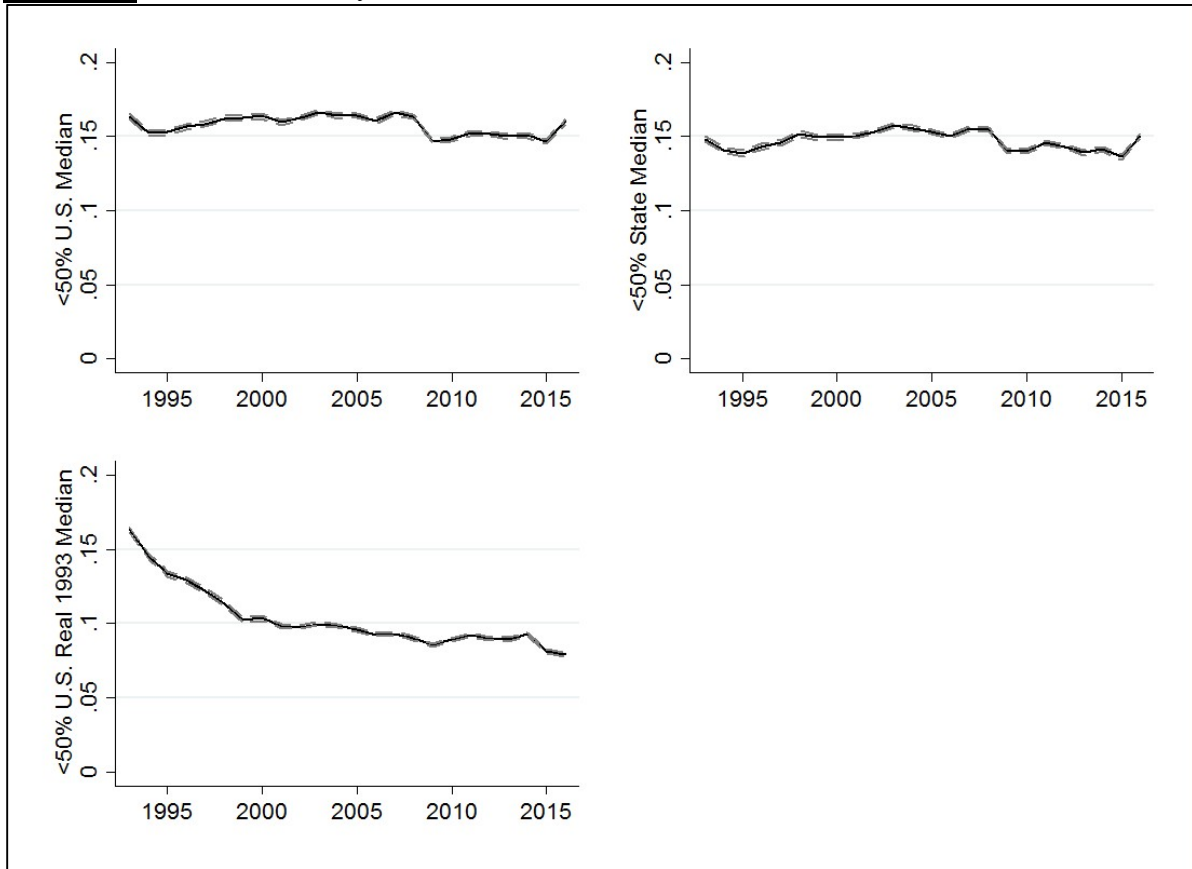
Katz, Michael B. 1989. *The Undeserving Poor* New York: Oxford University Press.

O'Connor, Alice. 2001. *Poverty Knowledge* Princeton, N.J.: Princeton University Press.

Section 3. Trends in Poverty at 30% of the Median.



Section 4. Trends in Poverty at 50% of the Median.



Section 5. Adjustments to TRIM3.

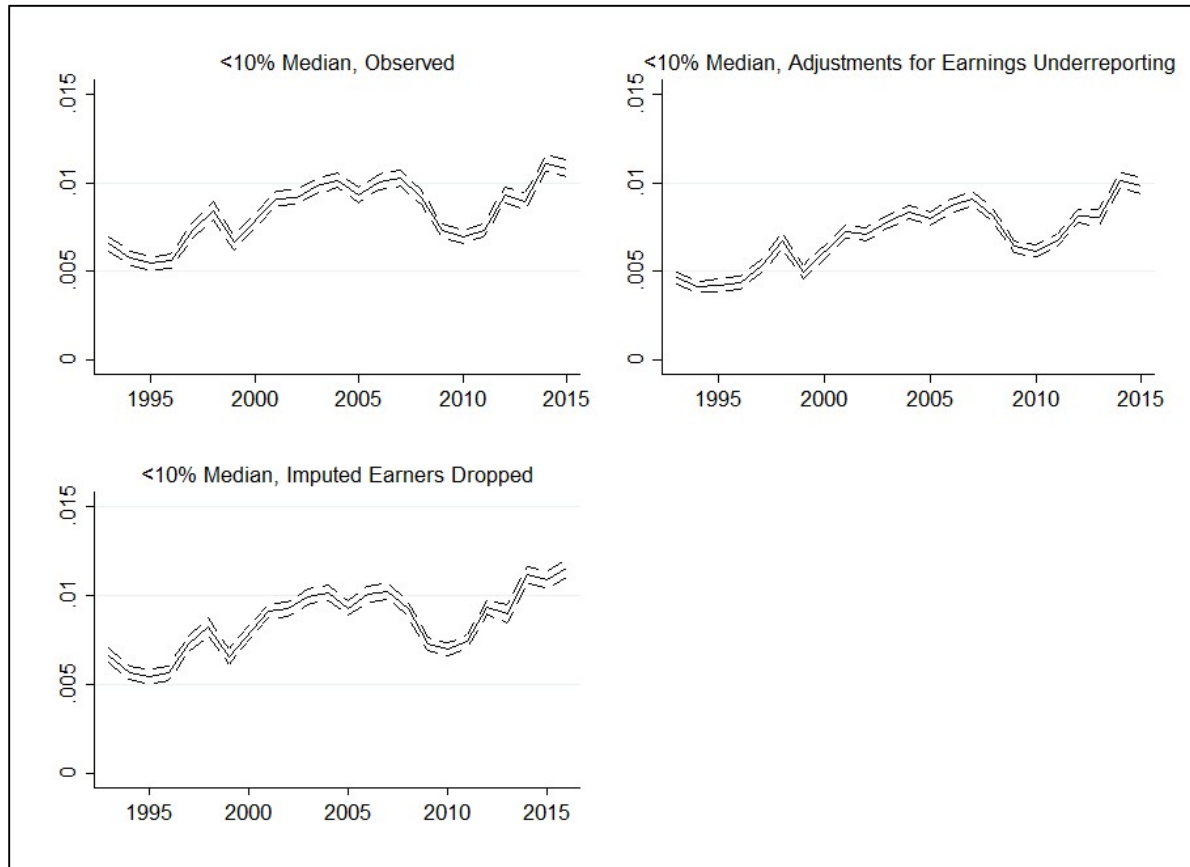
Recent evidence suggests that TRIM3 may slightly over-allocate imputed SNAP benefits to households with zero gross incomes (Stevens, Fox and Heggeness 2018). During 2011-2015, for example, Stevens, Fox, and Heggeness (2018) find that, according to administrative records, an unknown amount below 5% of annual SNAP participation is concentrated among households with zero gross income. Conversely, our TRIM-adjusted CPS data suggests that 5.26% of SNAP participation is concentrated among zero-income households in those same years. To account for the possibility that the TRIM-adjusted SNAP allocations overcorrect at the very bottom of the income distribution, we conduct a sensitivity analyses that simulates the share of zero-income households receiving SNAP benefits. We assume that the reported SNAP participation in the unadjusted CPS is a lower-bound estimate of the true SNAP participation, and that participation in the TRIM-adjusted CPS is an upper-bound estimate. For each year, we then calculate the midpoint between the unadjusted and TRIM-adjusted SNAP participations rates among zero-income households, and remove SNAP benefits from households at zero income (using a random number generator) until participation rates reach the midpoint value. In 2015, for example, the unadjusted participation was 3%, the TRIM-adjusted was 5%; thus, we adjust the participation rate to 4%.

We then re-estimate all the \$2/day measures. As expected, the share of households living in \$2-per-day poverty increases slightly after these adjustments. Using our measure of equivalized disposable household income, the \$2 poverty rate increases from 0.4 % to 0.49 % in 2015. In these new estimates, the highest estimated rate of \$2/day poverty is 0.59 % in 2007 (versus our reported 0.55 % in Figure 4 above). The lowest estimated rate becomes 0.28 in 1996 (versus 0.25 in 1996 in Figure 4). Though the estimated levels of \$2/day poverty increase slightly in each year, the trends remain unchanged.

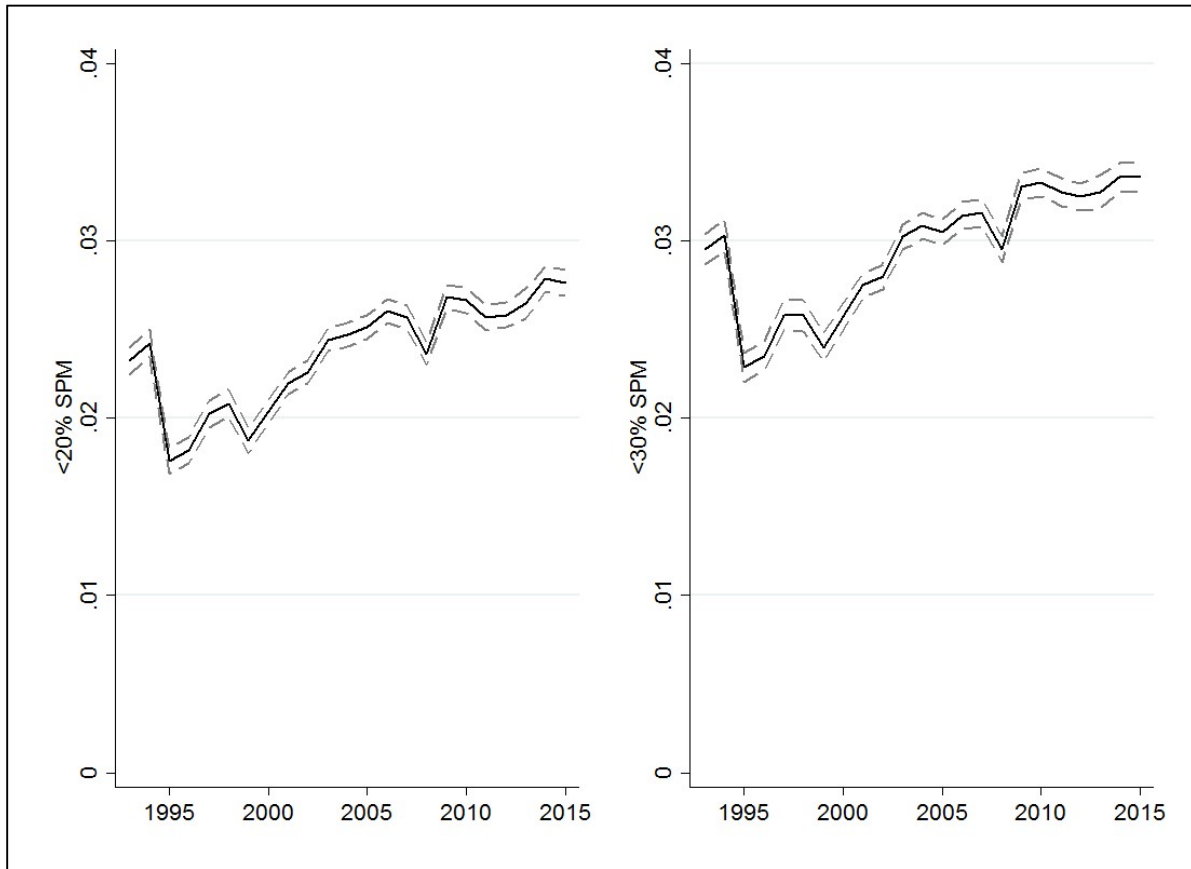
Additional Reference:

Stevens Kathryn, Liana E. Fox, and Misty L. 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; url: <https://www.census.gov/content/dam/Census/library/working-papers/2018/demo/SEHSD-WP2018-15.pdf>

Section 6. Trends in Poverty after Adjusting for Possible Earnings Misreporting.



Section 7. Trends in Proportion below 20% (Left) and 30% (Right) of Supplemental Poverty Measure, 1993-2016.



Section 8. Stata Code. **

Create Poverty Thresholds *

National Poverty Lines

```
foreach x in 10 20 30 50 {
  foreach y of numlist 1993 / 2015 {
    cap gen fpovline`x' = .
    qui sum edhir [w=wtsupp] if year==`y', de
    replace fpovline`x' = (r(p50)*(`x'/100)) if year==`y'
  }
}
```

*** State Poverty Lines**

```
levelsof statefip, local(levels)
foreach x in 10 20 30 50 {
  foreach y of numlist 1993 / 2015 {
    foreach z of local levels {
      cap gen spovline`x' = .
      qui sum edhir [w=wtsupp] if ( year==`y' | year==( `y'-1 ) | year==( `y'+1 ) ) & statef==`z', de
      replace spovline`x' = (r(p50)*(`x'/100)) if year==`y' & statef==`z'
    }
  }
}
```

*** Anchored Thresholds**

```
foreach x in 10 20 30 50 {
  cap gen afpovline`x' = .
  qui sum edhir [w=wtsupp] if year==1993, de
  replace afpovline`x' = (r(p50)*(`x'/100))
}
```

**** Removing high-income households with high tax liabilities from poverty.**

```
gen zerotaxed = 0
foreach x of numlist 1993 / 2015 {
  qui sum hhincome [w=wtsupp] if year==`x', de
  replace zerotaxed = 1 if hhincome>r(p50) & year==`x'
}
```

*** Concept 1: Disposable Household Income, Equivalized**

```
replace edhir = 0 if edhir < 0
// edhir = equivalised disposable housing income in 2014 USD
gen realedhir= edhir * .95 // converting from 2014 USD to 2011 USD
gen twodollarpov=0 if realedhir!=.
replace twodollarpov=1 if realedhir<(730)
replace twodollarpov = 0 if zerotaxed
foreach x in spov fpov afpov {
  gen `x'10 = 0
  replace `x'10 = 1 if edhir < `x'line10
  replace `x'10 = 0 if zerotaxed
  gen `x'20 = 0
  replace `x'20 = 1 if edhir < `x'line20
  replace `x'20 = 0 if zerotaxed
  gen `x'30 = 0
  replace `x'30 = 1 if edhir < `x'line30
  replace `x'30 = 0 if zerotaxed
  gen `x'50 = 0
  replace `x'50 = 1 if edhir < `x'line50
}
```

```

replace `x'50 = 0 if zerotaxed
}

```

* Concept 2: Labor Market Income, Pre-TANF

```

replace emir = 0 if emir < 0
gen realmir = emir * .95 // 2011 USD
gen mi_twodollarpo=0 if realmir!=.
replace mi_twodollarpo=1 if realmir<(730)
replace mi_twodollarpo = 0 if zerotaxed
foreach x in spov fpov afpov {
  gen `x'10_mi = 0
  replace `x'10_mi = 1 if emir < `x'line10
  replace `x'10_mi = 0 if zerotaxed
  gen `x'20_mi = 0
  replace `x'20_mi = 1 if emir < `x'line20
  replace `x'20_mi = 0 if zerotaxed
  gen `x'30_mi = 0
  replace `x'30_mi = 1 if emir < `x'line30
  replace `x'30_mi = 0 if zerotaxed
  gen `x'50_mi = 0
  replace `x'50_mi = 1 if emir < `x'line50
  replace `x'50_mi = 0 if zerotaxed
}

```

* Concept 3: Pre-Tax Cash Income, with PRE-TRIM Cash Benefits (SSI, Child Allowances, TANF)

```

by year hseq, sort: egen hinctot = total(inctot)
replace hinctot = 0 if hinctot < 0
gen e_hinctot = hinctot / (sqrt(perhh)) / cpi
gen realhinctot = e_hinctot * .95
gen mic_twodollarpo = 0 if realhinctot!=.
replace mic_twodollarpo = 1 if realhinctot < (730)
replace mic_twodollarpo = 0 if zerotaxed
foreach x in spov fpov afpov {
  gen `x'10_mic = 0
  replace `x'10_mic = 1 if e_hinctot < `x'line10
  replace `x'10_mic = 0 if zerotaxed
  gen `x'20_mic = 0
  replace `x'20_mic = 1 if e_hinctot < `x'line20
  replace `x'20_mic = 0 if zerotaxed
  gen `x'30_mic = 0
  replace `x'30_mic = 1 if e_hinctot < `x'line30
  replace `x'30_mic = 0 if zerotaxed
  gen `x'50_mic = 0
  replace `x'50_mic = 1 if e_hinctot < `x'line50
  replace `x'50_mic = 0 if zerotaxed
}

```

** Concept 4: Pre-Tax Cash Income, with TRIM-CORRECTED Cash Benefits (SSI, TANF)

```

gen inctot_trim = inctot - incwelf - incssi + socassist + tanftrim_p + ssitrim_p
by year hseq, sort: egen hinctot_trim = total(inctot_trim)
gen e_hinctot_trim = hinctot_trim / (sqrt(perhh)) / cpi
gen realhinctot_trim = e_hinctot_trim * .95
gen mict_twodollarpo = 0 if realhinctot_trim!=.
replace mict_twodollarpo = 1 if realhinctot_trim < (730)
replace mict_twodollarpo = 0 if zerotaxed
foreach x in spov fpov afpov {

```

```

gen `x'10_mict = 0
replace `x'10_mict = 1 if e_hinctot_trim < `x'line10
replace `x'10_mict = 0 if zerotaxed
gen `x'20_mict = 0
replace `x'20_mict = 1 if e_hinctot_trim < `x'line20
replace `x'20_mict = 0 if zerotaxed
gen `x'30_mict = 0
replace `x'30_mict = 1 if e_hinctot_trim < `x'line30
replace `x'30_mict = 0 if zerotaxed
gen `x'50_mict = 0
replace `x'50_mict = 1 if e_hinctot_trim < `x'line50
replace `x'50_mict = 0 if zerotaxed
}

```

** Concept 5: Pre-Tax Cash Income + SNAP, with TRIM-CORRECTED Cash Benefits (SSI, TANF) and CORRECTED SNAP

```

gen inctot_trimsnaptrim = inctot - incwelf - incssi + socassist + tanfrim_p + ssitrim_p + snaptrim
by year hseq, sort: egen hinctot_trimsnaptrim = total(inctot_trimsnaptrim)
replace hinctot_trimsnaptrim = 0 if hinctot_trimsnaptrim < 0
gen e_hinctot_trimsnaptrim = hinctot_trimsnaptrim / (sqrt(perhh)) / cpi
gen realhinctot_trimsnaptrim = e_hinctot_trimsnaptrim * .95
gen mictst_twodollar pov = 0 if realhinctot_trimsnaptrim != .
replace mictst_twodollar pov = 1 if realhinctot_trimsnaptrim < (730)
replace mictst_twodollar pov = 0 if zerotaxed
foreach x in spov fpov afpov {
  gen `x'10_mictst = 0
  replace `x'10_mictst = 1 if e_hinctot_trimsnaptrim < `x'line10
  replace `x'10_mictst = 0 if zerotaxed
  gen `x'20_mictst = 0
  replace `x'20_mictst = 1 if e_hinctot_trimsnaptrim < `x'line20
  replace `x'20_mictst = 0 if zerotaxed
}

```

** Concept 6: Market Income, w/TRIM-CORRECTED Cash Benefits (SSI, TANF), but CORRECTED SNAP at 50%

```

gen inctot_trimsnaptrim50 = inctot - incwelf - incssi + socassist + tanfrim_p + ssitrim_p + (snaptrim * .5)
by year hseq, sort: egen hinctot_trimsnaptrim50 = total(inctot_trimsnaptrim50)
replace hinctot_trimsnaptrim50 = 0 if hinctot_trimsnaptrim50 < 0
gen e_hinctot_trimsnaptrim50 = hinctot_trimsnaptrim50 / (sqrt(perhh)) / cpi
gen realhinctot_trimsnaptrim50 = e_hinctot_trimsnaptrim50 * .95
gen mictst_twodollar pov50 = 0 if realhinctot_trimsnaptrim50 != .
replace mictst_twodollar pov50 = 1 if realhinctot_trimsnaptrim50 < (730)
replace mictst_twodollar pov50 = 0 if zerotaxed
foreach x in spov fpov afpov {
  gen `x'10_mictst50 = 0
  replace `x'10_mictst50 = 1 if e_hinctot_trimsnaptrim50 < `x'line10
  replace `x'10_mictst50 = 0 if zerotaxed
  gen `x'20_mictst50 = 0
  replace `x'20_mictst50 = 1 if e_hinctot_trimsnaptrim50 < `x'line20
  replace `x'20_mictst50 = 0 if zerotaxed
}

```