Precision in Measurement: Using State-Level SNAP Administrative Records and the Transfer Income Model (TRIM3) to Evaluate Poverty Measurement

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**This paper was was developed to promote research and advancements in our understanding of poverty measurement. In that spirit and to encourage discussion and thoughtful feedback at early stages of our work, this paper has undergone a more limited review than official Census Bureau reports. All views and any errors are solely those of the authors and do not necessarily reflect any official position of the Bureau.*

ABSTRACT

Policy leaders today look to quality data and statistics to help inform and guide programmatic decisions. As a result, assessing the quality and validity of major household surveys in capturing accurate program participation is essential. One method for evaluating survey quality is to compare self-reported program participation in surveys to administrative records from the program itself. In this paper, we are interested in understanding two issues. First, how closely do Supplemental Nutrition Assistance Program (SNAP) participation and benefit amounts align between self-reported survey responses and other source data on program participation? Second, how does replacing household survey self-reported SNAP values with alternative source records for SNAP change poverty measurement in the Supplemental Poverty Measure (SPM)? We find that 46 percent of SNAP recipients (according to administrative records) do not report receipt in self-reported survey responses and 36 percent of SNAP recipients are not estimated to receive benefits in a microsimulation model. This results in a SPM rate that is 0.4 percentage points lower when state SNAP administrative records are used instead of survey self-reported SNAP receipt and 0.9 percentage points lower when estimates from a microsimulation model are used instead of survey self-reported SNAP receipt.

INTRODUCTION

Policy leaders today look to quality data and statistics to help inform and guide programmatic decisions. As a result, assessing the quality and validity of major household surveys in capturing accurate program participation is essential. One method for evaluating survey quality is to compare self-reported program participation in surveys to administrative records from the program itself.

Previous research using administrative records to evaluate self-reported Supplemental Nutrition Assistance Program (SNAP) receipt has found evidence of underreporting in the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) for select states where administrative records were available. Meyer and Mittag (2015) compared SNAP, TANF and general assistance, and housing assistance administrative records from New York to the 2008 through 2013 CPS ASEC. Fox et al. (2017) compared SNAP self-reporting in the CPS ASEC to state SNAP administrative records from Illinois, Maryland, Oregon, and Virginia for calendar years 2009 through 2015. Both studies found that the CPS ASEC understates household resources of those in poverty due to underreporting of program receipt and benefit amounts. Fox et al. (2017) estimated that the underreporting of SNAP participation inflates the SPM rate by 0.6 percentage points.

One possible solution to the issue of underreporting of transfer program benefits is to use a microsimulation model that corrects for this underreporting, such as the Transfer Income Model, version 3 (TRIM3). TRIM3 produces annual baseline simulations of actual program rules to correct for the underreporting of transfer program participation in the CPS ASEC.[1] There are

[1] TRIM3 is developed and maintained by the Urban Institute under funding from the Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (HHS/ASPE). For more information on TRIM3, see http://trim.urban.org.

several reasons to use a microsimulation model instead of administrative records, including coverage and consistency of the data across states and restrictions on access to administrative records due to confidentiality.

In this paper, we are interested in understanding two issues. First, how closely do self-reported SNAP participation and benefit amounts in the CPS ASEC, as well as SNAP corrected for underreporting with TRIM3, align with state-level administrative records? Second, how does replacing values from the CPS ASEC with TRIM3 values or administrative records for SNAP change poverty measurement in the Supplemental Poverty Measure (SPM)? We link individual-level data from state administrative SNAP records and microdata from TRIM3 for seven states (Arizona, Idaho, Illinois, Maryland, Oregon, Tennessee, and Virginia) to individuals in the CPS ASEC for calendar years 2009 to 2014.

This study allows us to understand the role of administrative records and microsimulation in the measurement of national statistics. It expands the sample of states for which we have SNAP administrative records to see if the patterns of benefit underreporting are consistent across a larger sample of states and years. Given current trends in the reliance of administrative records to improve survey measurement and reduce respondent burden, this paper advances our knowledge of the relevance and the role administrative records can play in increasing accuracy and precision in measuring national statistics, such as the SPM. The paper also improves our understanding of how closely output from microsimulation models align with administrative records at the household level, rather than just at the aggregate level.

BACKGROUND

Supplemental Nutrition Assistance Program (SNAP)

SNAP, formerly referred to as Food Stamps, provides in-kind benefits aimed at reducing hunger for low-income individuals and households. SNAP benefits are available to any individuals and households meeting the program eligibility requirements, which are based largely on income thresholds. Households must meet two income tests to be eligible for SNAP:

- Gross income test – a household's total income before any deductions must be below 130 percent of the Federal Poverty Guidelines (FPG), and
- Net income test – a household's gross income minus certain allowable deductions must be below 100 percent of FPG (USDA 2017b).

This means that for fiscal year 2018, a non-elderly, non-disabled single mother with two children whose only source of income is earnings and who does not pay for child care can earn up to $26,556 and still qualify for SNAP. For non-elderly, non-disabled individuals, eligibility is also subject to asset limits and work requirements.

Once a family qualifies for SNAP, the benefit amount they receive is determined by the household's net income and the number of household members. Households receiving SNAP are expected to spend 30 percent of their income on food. Therefore, the SNAP benefit amount is calculated by subtracting 30 percent of the household's net income from the maximum benefit amount for the household size. Figure 1 shows the maximum monthly SNAP benefit by household size for fiscal years 2009 through 2017. As of fiscal year 2017, the maximum benefit amount for a family size of three was $511 per month.

Participation rates for the Food Stamp/SNAP program have varied throughout its roughly 40 years of existence in response to changes in the broader economy and program

administration, rules, and policies. In recent years, diminished labor market conditions have increased the number of SNAP recipients (Ganong and Liebman 2013). Since the beginning of the most recent recession, SNAP take-up has nearly doubled, and the increase has persisted even after the economic recovery. In 2008, there were about 28.2 million participants; by 2013, that number had increased to 47.6 million (USDA 2017c). For fiscal year 2013, it is estimated that 85 percent of eligible households participated, with the participation rates varying significantly across states (Gray and Cunnyngham 2016). As of May 2016, approximately one in seven U.S. residents received SNAP benefits (FRAC 2016). Because SNAP coverage rates are high, inaccurate reporting of SNAP take-up has the potential to influence poverty estimates like the SPM.

Supplemental Poverty Measure (SPM)

Poverty measurement and our conceptual definitions of poverty are evolving. Every year since 1966, the Census Bureau calculates an official U.S. poverty measure (Semega, Fontenot, and Kollar 2017). The official poverty measure compares household pre-tax cash income to a poverty threshold. The SPM, an alternative measure of poverty, incorporates multiple resources entering households (such as benefits from SNAP and similar programs) in addition to earnings and other cash income.[2] The SPM also subtracts certain expenses (such as medical expenses and federal and state income taxes) that the household incurs.

The U.S. Census Bureau has been conducting research on alternative measures of poverty since the 1990s and reporting SPM rates since 2011 (Short et al. 1999; Short 2011). These reports and continued research generally use self-reported values for resources coming into the

[2] Thresholds for the SPM are produced by the BLS Division of Price and Index Number Research. See Fox (2017) for the 2015 and 2016 thresholds.

household to estimate alternative measures. Where those values do not exist, they are modeled or imputed.

Prior Research

Some researchers have criticized the quality of household survey program participation and earnings data (Marquis and Moore 1990; Groves 2006; Meyer, Mok, and Sullivan 2015). Recent research on this topic has shown that survey response to program participation undercounts the participation rates and benefit amounts (Meyer and Goerge 2011; Harris 2014; Meyer and Mittag 2015; Colby et al. 2017; Fox et al. 2017). Meyer and Mittag find inconsistencies in SNAP reporting in the CPS ASEC in New York State, specifically that around 40 percent of surveyed SNAP recipients do not report receipt in the CPS ASEC. Fox et al. (2017) compare SNAP self-reporting in the CPS ASEC to state SNAP administrative records from Illinois, Maryland, Oregon, and Virginia for calendar years 2009 through 2015. They find that about 51 percent of SNAP recipients do not report receipt in the CPS ASEC. Both studies find that the CPS ASEC understates the resources available to those in poverty due to underreporting of program receipt and benefit amounts. This type of response error cannot be assumed for all surveys, however, as some methods of data collection can prove more fruitful than others in terms of capturing program participation. Colby et al. (2017) identify underreporting but found higher rates of agreement between the Survey of Income and Program Participation (SIPP) self-reported SNAP receipt and administrative records. They find that approximately 16 percent of SNAP recipients did not report SNAP participation in the SIPP.

Transfer Income Model, version 3 (TRIM3)

TRIM3 produces annual baseline simulations of actual program rules to correct for the underreporting of transfer program participation in the CPS ASEC. TRIM3 is a microsimulation model that begins with each year's CPS ASEC and respondents' self-report of program participation. The simulation then identifies eligible units under each program using the program rules and selects additional participants to match administrative targets for the number of recipients, available demographic characteristics, and the total benefit amount. The programs that are simulated by TRIM3 include cash and in-kind transfer programs (SNAP, Temporary Assistance to Needy Families, child care subsidies, child support, etc.), health insurance programs (Medicare, Medicaid, Children's Health Insurance Program (CHIP), etc.), and tax programs (federal and state income taxes and payroll taxes). The simulations of the programs are run in a specified order in order to capture the interactions and relationships between programs. TRIM3 adjusts both CPS ASEC respondents' reported participation in programs as well as their reported value of benefits received.

DATA

This paper links SNAP administrative records for seven states (Arizona, Idaho, Illinois, Maryland, Oregon, Tennessee, and Virginia) to individuals in the CPS ASEC[3] and TRIM3 for calendar years 2009 to 2014.[4] The CPS is a household survey primarily used to collect employment data. The CPS is usually fielded over the phone with one household respondent

[3] The data are subject to error arising from a variety of sources, including sampling error and nonsampling error. For more information, please visit https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar17.pdf.
[4] For the 2014 CPS ASEC, we use the full ASEC supplement (the combined 5x8 and 3x8 file) for this analysis. For more information about the redesigned ASEC supplement, please see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar14R.pdf.

answering the questions for all household members.[5] The CPS ASEC sample is based on the noninstitutionalized population of the United States. The CPS ASEC asks detailed questions categorizing income into over 50 sources, including SNAP benefits.

Through the 2014 CPS ASEC (for calendar year 2013), respondents are asked the following questions regarding SNAP receipt:

1. Did (you/anyone in this household) get SNAP (Supplemental Nutrition Assistance Program), food stamps or a food stamp benefit card at any time during [year]?[6]
2. At any time during [year], even for one month, did (you/anyone in this household) receive any food assistance from (State Program name) or a food assistance benefit card (such as State EBT card name)?[7]
3. Which of the people now living here were covered by that food assistance during [year]?

Starting in the redesigned 2014 CPS ASEC, respondents are asked the following questions regarding SNAP receipt:

1. Did (you/anyone in this household) get food stamps or use a food stamp benefit card at any time during [year]?
2. At any time during [year], even for one month, did (you/anyone in this household) receive any food assistance from (State Program name)?
3. Which of the people now living here were covered by that food assistance during [year]?

[5] We might expect that the survey respondent would more accurately report a benefit he or she applied for and received, rather than a benefit received by another member of the household. For example, if the respondent received SNAP, he or she might have a better recollection of the length of benefit receipt and the benefit amount than if his or her spouse or someone else in the household was the "direct" beneficiary of SNAP.
[6] This question was not asked in the 2011 CPS ASEC (for calendar year 2010).
[7] Only those who respond "No" to the first question are asked the second question. For most states, the State Program name in the second question is filled in as "SNAP". For the 2018 CPS ASEC, the question changed to "At any time during [year] did (you/anyone in this household) receive benefits from SNAP (the Supplemental Nutritional Assistance Program) or the Food Stamp Program or use a SNAP or food stamp benefit card?"

After asking about all of the different sources of income, the questionnaire asks the following questions about the amount of SNAP benefits received if anyone in the household received SNAP benefits:[8]

4. What is the easiest way for you to tell us the value of the food assistance: monthly or yearly?
5. What is the (monthly) value of the food assistance received in [year]?
6. How many months was food assistance received in [year]?

Beginning in the 2014 CPS ASEC, if a respondent doesn't know or refuses to provide an exact benefit amount, they are given follow-up questions that ask whether the benefits received were within one of five sets of ranges. Finally, the respondent is asked to confirm the total annual SNAP benefit amount. Since 2014 these questions are asked of all ASEC respondents, but low-income respondents are asked about SNAP earlier in the income section than other respondents. Prior to 2014, the SNAP questions were only asked of respondents with total family income less than $75,000 or who refused to answer the question about total family income.

The individual-level SNAP administrative records used in this paper are collected at the state level. As such, the structure and information contained in the records differ by state. Each set of state SNAP administrative records include the full population of SNAP recipients in that state and year.[9] We cleaned and recoded each state-year of administrative records to create person-month-level and person-year-level data files. For purposes of this paper, we organize the

[8] Prior to the redesigned 2014 CPS ASEC (for calendar year 2013), the questions about the amount of SNAP received were asked immediately following the questions about SNAP receipt (rather than after asking about receipt of all sources of income).

[9] There is a potential discrepancy between the CPS ASEC and the SNAP administrative records in that the CPS ASEC covers the noninstitutionalized population whereas the administrative records cover the full population. However, generally individuals are not eligible for SNAP benefits if they are in an institution that provides meals. The two exceptions to this rule are residents of federally subsidized housing for the elderly and disabled individuals who live in non-profit small group homes with no more than 16 residents, even if these institutions provide meals. For more information on SNAP eligibility rules, please see https://www.fns.usda.gov/snap/eligibility.

SNAP benefit information in the CPS ASEC, TRIM3, and administrative records to household-receipt year-level files, with variables capturing whether the household or SPM unit received any SNAP benefits in the receipt year and the household or SPM unit annual benefit amount.[10] The administrative records do not cover the full period for all seven states – the administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009 through 2014, Idaho covers calendar years 2010 through 2014, and Virginia covers calendar years 2009 through 2013.

The CPS ASEC and TRIM3 data are directly linked through the household and person identification number. The TRIM3 data include the monthly and annual adjusted SNAP benefit amount, the number of months of SNAP benefit receipt, and the members of the household receiving SNAP. The TRIM3 data include some households that are replicated, primarily high-income households, in order to adjust for the underrepresentation of these households in the CPS sample. In the match with the CPS ASEC, the TRIM3 replicate cases were collapsed and the weights were adjusted to account for the de-replication to ensure that the population weight is preserved.[11]

The combined CPS ASEC and TRIM3 data are then linked to the administrative records through a probabilistic matching technique. This method assigns a unique identification number (called a protected identification key or PIK) to each individual based on a variety of uniquely

[10] There are issues assigning individual versus household SNAP participation and benefit amounts. In the SNAP administrative records, the benefit amounts given are at the SNAP unit-level. SNAP units include anyone who lives together and purchases and prepares meals together. Therefore, there may be multiple SNAP units in a single housing-unit. Also, there may be discrepancies between how SNAP households are defined and how SPM units, used to group individuals together to measure the SPM poverty rates, are defined. For the purposes of this analysis, we disaggregated the SNAP benefit amounts from the administrative records to assign an individual benefit amount for each member of the SNAP unit. Then, for our analysis, we used individual SNAP receipt and benefit amounts aggregated to the household-level or aggregated to the SPM unit-level.

[11] For more information on this process, see http://trim3.urban.org/documentation/input/concepts%20and%20procedures/MergeReplicateHHBackToSingleHH.php.

identifying information.[12] The Census Bureau assigns these identifiers to survey respondents and individuals in the administrative records. Since the identifiers are unique to individuals, they can be used to link the same individual across data sources. To create our analytic sample of matched records, we merged the CPS/TRIM3 data with the SNAP administrative records using these unique identifiers.

Not all survey respondents or individuals within administrative records can be assigned a PIK. In total, there are 148,449 individuals in the pooled CPS ASEC/TRIM3 sample for the seven states in their respective years of SNAP data coverage. Of those, 130,235 individuals or 87.7 percent of observations had PIKs (see Figure 2). In order to address the potentially non-random exclusion of individuals without a PIK, we use inverse probability weighting (IPW).[13] The inverse probability weights are created by dividing the CPS ASEC sample weight by the predicted probability of the individual having a PIK.[14]

We are interested in how self-reported SNAP receipt differs from administrative records. For our final analytic sample, we exclude individuals whose SNAP participation or benefit amount was imputed in the CPS ASEC.[15] We also exclude any state mismatches. State mismatches occur when an individual indicates they live in one state in the CPS ASEC and the administrative records identify them living in a different state for program receipt. Less than 0.1 percent of the pooled CPS ASEC/TRIM3 sample with a linked SNAP record has a state mismatch. A state mismatch may indicate an incorrect match based on PIK or that the individual moved to a different state during the calendar year or early the following year, in which case one

[12] See Wagner and Lane (2014) for a detailed description of the process used to assign PIKs.
[13] For a detailed description of inverse probability weighting, see Wooldridge (2007).
[14] We used a logit regression model to predict the probability of an individual having a PIK with the following independent variables: sex, age, education, race and Hispanic origin, nativity, marital status, region, residence, and work experience.
[15] We excluded about 6.5 percent of individuals with a PIK because their SNAP participation and/or benefit amount was imputed.

state's administrative records may not fully capture their SNAP benefit amount if they received benefits in multiple states.[16]

The SNAP administrative records only indicate receipt of SNAP; they do not identify individuals who did not receive SNAP. We assume an individual does not participate in the SNAP program if they have a PIK in the CPS that does not link to any SNAP record with a PIK. To the extent that there is differential non-linking (for example, an individual has a PIK in the CPS, but does not have a PIK in SNAP administrative records) or there is incorrect assignment of PIKs to individuals, processing errors will tend to decrease the estimates of "true" SNAP participation, increase the estimates of false positive rates, and decrease the estimates of false negative rates.

The final pooled sample includes 121,698 individual-year observations – 13,368 in Arizona; 10,267 in Idaho; 29,546 in Illinois; 23,266 in Maryland; 13,857 in Oregon; 13,475 in Tennessee; and 17,919 in Virginia (see Table 1). While we do provide some descriptive analysis by state in this paper, the modeling methodologies and write-up focus primarily on the pooled sample.

We present the results in this paper for annual SNAP benefit amounts, and include selected results for monthly benefit amounts in the appendix. We focus on annual SNAP amounts because they are the inputs to the SPM. There are complexities with using either annual or monthly SNAP benefit amounts though. In the CPS ASEC, respondents are given the option to report SNAP benefits monthly or yearly and then asked the number of months of benefit receipt. Of all respondents who indicated they received SNAP in the CPS ASEC in our sample

[16] In the CPS ASEC, the state of residence is measured as of the survey date, between February and April. This state of residence is then compared to the state in the matched administrative records for the previous year. The issue of not fully capturing SNAP benefits applies to those who move into any of the seven states during this period as well. It should not affect participation rates, however.

years, nearly 95 percent provided a monthly benefit amount.[17] When we examine the annual difference in amounts between the CPS ASEC and the administrative records, there are two possible sources of inaccuracy (if the amounts are reported monthly): the reported monthly benefit amount and the reported months of receipt.

Based on previous research we would expect to see a shortfall in both monthly and annual SNAP benefit amounts in the CPS ASEC, and possibly a greater shortfall in annual benefit amounts if the months of receipt is also underreported. For TRIM3, though, we would expect to see monthly and annual benefit amounts that are very close to administrative records because TRIM3 uses aggregate administrative values as targets for the microsimulation.

We find that for most individuals in the CPS ASEC with data in the administrative records the number of months of SNAP receipt does not align between the two data sources. The number of months of SNAP receipt is consistent in the CPS ASEC and administrative records for 45 percent of individuals (with the vast majority of these individuals reporting 12 months of receipt) and the number of months of SNAP receipt is different across data sources for 55 percent of individuals, conditional on reporting SNAP receipt for at least one month in the administrative records and CPS ASEC.[18] We will examine discrepancies in annual benefit amounts in the next section and briefly touch on the difference in annual and monthly benefit amounts.

[17] In the administrative records, the state reports the amount of benefits for each month. For our analysis, we use either the benefit amounts for each month aggregated to an annual amount, or the monthly amounts averaged over the number of months of benefit receipt from the administrative records.
[18] All comparative statements in this report have undergone statistical testing, and, unless otherwise noted, all comparisons are statistically significant at the 10 percent significance level.

METHODS AND ANALYSIS

Once we have our final analytic sample, we examine the magnitude of difference in reporting between survey self-report and administrative records. To do this, we categorize individuals into four categories. Those who are:

(1) Identified in both household survey data and administrative records as receiving SNAP – *true positives,*

(2) Not identified in either household survey data or administrative records as receiving SNAP – *true negatives,*

(3) Identified in household survey data as receiving SNAP but not in administrative records – *false positives,* and

(4) Identified in administrative records as receiving SNAP but not in household survey data – *false negatives.*

We create the same categories to compare the difference in reporting between data from TRIM3 and administrative records. Table 2A and 2B show the breakout of our sample into these four categories – Table 2A for the CPS ASEC and Table 2B for TRIM3 data. The false negative rate, the percentage of individuals receiving SNAP according to administrative records not reporting receipt in the household survey, is around 46 percent for the CPS ASEC variable and 36 percent for the TRIM3 variable. Even though the false negative rate is higher for the CPS ASEC measure than the TRIM3 measure, this is somewhat balanced by the lower false positive rate for the CPS ASEC variable than the TRIM3 variable. The false positive rate, the percentage of individuals receiving SNAP in the household survey data but not in administrative records, is 0.5 percent for the CPS ASEC measure and 7.7 percent for the TRIM3 measure. We also find that the true negative rate is significantly higher in the CPS ASEC (99.5 percent compared to

92.3 percent), whereas the true positive rate is significantly higher in the TRIM3 data (63.6 percent compared to 54.1 percent).

Figure 3 shows the false negative rates over time for both the CPS ASEC and TRIM3. The false negative rates are significantly lower for TRIM3 than the false negative rates for the CPS ASEC in each year.[19] Figure 4 shows the false negative rates by state for both the CPS ASEC and TRIM3. The false negative rates are significantly lower for TRIM3 than the false negative rates for the CPS ASEC in each state, except in Oregon where they are not statistically different.

We then compare households receiving SNAP according to administrative records with households with at least one individual receiving SNAP according to the CPS ASEC. We repeat the same comparison for TRIM3 as well. Table 3A shows the percent of households reporting receipt of SNAP in the CPS ASEC as well as in the administrative records. We also examine the magnitude of the difference in annual benefit amount between administrative records and household survey data. Table 3B shows the corresponding table comparing TRIM3 with the administrative records.[20]

The overall SNAP rate of receipt is 9.1 percent in the CPS ASEC and 16.6 percent in TRIM3, whereas the rate of receipt in the administrative records is 16.0 percent, resulting in 43 percent underreporting of receipt in the survey data and 4 percent over-estimation of receipt in the microsimulation model. The average annual SNAP benefit in the CPS ASEC is

[19] The false negative rates for the CPS ASEC are significantly different year-over-year, except the apparent differences between 2012 and 2013 and between 2013 and 2014. The false negative rates for TRIM3 are not significantly different year-over-year, except the increase between 2013 and 2014.

[20] The average annual SNAP benefit amount for the administrative records is slightly different in Tables 3A and 3B because the samples are different. In Table 3A, we restrict the sample to households with a positive SNAP benefit in both the CPS ASEC and administrative records. In Table 3B, we restrict the sample to households with a positive SNAP benefit in both TRIM3 and administrative records.

underreported by $80.[21] However, we would have expected the underreporting to be higher for annual benefit amounts because the average underreporting in monthly benefit amounts in the CPS ASEC is $74 (see Appendix Table 3A). The annual underreporting may less than expected due to reporting more months of receipt than actually received. Interestingly, for TRIM3 benefit amounts, the average annual benefit is slightly overestimated (by $128), whereas the monthly average monthly SNAP benefit in TRIM3 is slightly underestimated (by $40), compared with the administrative records (see Appendix Table 3B). This discrepancy appears to be due to differences in the number of months of receipt between TRIM3 and the administrative records.

We then look at the distribution of the annual SNAP benefit amounts by data source. Figure 5 shows the kernel density plot of annual SNAP benefit amounts conditional on the SNAP benefit being positive in each data source. In the CPS ASEC data compared to administrative records, there is a lower proportion of observations with annual SNAP benefit amounts below about $2,500 and a higher proportion of observations with annual SNAP benefit amounts above $2,500.

Next we examine a kernel density plot of the difference in annual SNAP benefit amounts between the CPS ASEC and administrative records and between TRIM3 and administrative records, conditional on positive benefit amounts in both data sources for each difference (see Figure 6). Because TRIM3 allocates SNAP benefit receipt to some households who are estimated to be eligible but do not report receiving SNAP on the CPS ASEC, we would expect that it would not necessarily allocate SNAP to the exact people who receive the benefit according to administrative records. In this plot though, we look at how close the annual benefit amounts are for SNAP recipients who report receiving it on the CPS ASEC or are estimated to receive it in

[21] The average monthly SNAP benefit amounts by data source can be found in Appendix Tables 3A and 3B.

TRIM3. We also compare the distribution of the logged total income from the CPS ASEC for those identified as SPM units receiving SNAP in each data source using a kernel density plot (see Figure 7).[22]

Table 4 reports a linear probability model of having unreported SNAP benefits in the CPS ASEC, a linear probability model of having under imputed SNAP receipt in TRIM3, an ordinary least squares model of the extent the annual SNAP benefit is underreported in the CPS ASEC conditional on receiving SNAP in both the CPS ASEC and the administrative records, and an ordinary least squared model of the extent the annual SNAP benefit is underestimated in TRIM3 conditional on receiving SNAP in both TRIM3 and the administrative records. All four regression models condition on year- and state-level fixed effects. We also control for the type of SPM unit and race/ethnicity of the SPM unit head.[23]

Multiple factors influence the probability of having unreported SNAP benefits in the CPS ASEC when it is reported in administrative records. The likelihood of correctly reporting SNAP receipt increases at a decreasing rate with income. This means that lower-income units are more likely to fail to report receipt of SNAP benefits than higher-income units. Factors that increase the probability of accurately reporting SNAP receipt include the number of children in the SPM unit; renting; living outside a MSA; having a SPM unit head with public and no private insurance or with no insurance; having a SPM unit head who worked less than full-time, year round, who did not work, or who is not working age; and having a SPM unit head with a disability. For example, each additional child is associated with a 4 percentage-point increase in the probability

[22] We define SNAP recipients as those with positive SNAP benefits in each data source. We use total SPM unit income as reported in the CPS ASEC and summed for the SPM unit.
[23] The fixed effects and controls are not shown in Table 4.

of accurately reporting SNAP participation. However, having a SPM unit head under 25 years old significantly decreases the probability of accurately reporting receipt.

Conditional on reporting positive values of SNAP in the CPS ASEC, few factors are statistically significant in terms of reporting an annual benefit that is different than the annual value in administrative records. The statistically significant factors are the number of kids in the SPM unit, having a SPM unit head under 25 years old, and having a SPM unit head that worked less than full-time and year round. All of these characteristics, except having a SPM unit head under 25 years old, are correlated with lower benefit levels in the CPS than in the administrative records. For example, each additional child in the household is associated with a $200 increase in the difference between the annual SNAP benefit amount in the CPS ASEC and administrative records. Having a SPM unit head under 25 years old is correlated with higher benefit levels in the CPS than in the administrative records. Appendix Table 4 includes the results of an ordinary least squares model of the extent the monthly SNAP benefit is underreported in the CPS ASEC.

Multiple factors influence the probability of having misestimated SNAP benefits in the TRIM3 when it is reported in administrative records including many of the same factors as the model predicting unreported SNAP in the CPS ASEC. The log of total income and the log of total income squared for the SPM unit are statistically significant, meaning that the probability of (correctly) predicting SNAP receipt increases at a decreasing rate with income. The number of children in the SPM unit increases the probability of predicting a value closely aligned with administrative records, as does having a SPM unit head with public and no private insurance or without insurance; having a SPM unit head who worked less than full-time, year round, who did not work, or who is not working age; and having a SPM unit head with a disability. For example, each additional child is associated with a 5 percentage-point increase in the probability of

accurately predicting SNAP participation. However, having a SPM unit head under 25 years old, and having an owner with no mortgage significantly decrease the probability of accurately predicting receipt.

Conditional on estimating positive values of SNAP in TRIM3, several factors are statistically significant in terms of estimating an annual benefit that is different than the annual value in administrative records. The statistically significant factors are the log of total income, the log of total income squared, the number of kids in the SPM unit, having a SPM unit head under 25 years old, living as an owner with no mortgage or a renter, having a SPM unit head with public and no private insurance, and having a SPM unit head that did not work. The log of total income and the log of total income squared for the SPM unit are significant, meaning that the likelihood of underestimating benefit levels in TRIM3 relative to the administrative records increases at a decreasing rate with income. All of the remaining characteristics, except the number of kids in the SPM unit, having a SPM unit head under 25 years old, and having a SPM unit head that did not work, are correlated with lower benefit levels in TRIM3 than in the administrative records. For example, living as an owner with no mortgage is associated with a $366 increase in the difference between the annual SNAP benefit amount in TRIM3 and administrative records. The number of kids in the SPM unit, having a SPM unit head under 25 years old, and having a SPM unit head that did not work are correlated with higher benefit levels in TRIM3 than in the administrative records. Appendix Table 4 includes the results of an ordinary least squares model of the extent the monthly SNAP benefit is underreported in TRIM3.

So far we have only examined the magnitude and statistical significance of measurement differences between administrative records, the CPS ASEC, and TRIM3. Next, we focus specifically on poverty measurement using the administrative records, CPS ASEC, and TRIM3

separately as inputs to estimate the SPM.[24] We calculate the SPM for only the states for which we have administrative records for SNAP. Then, we change one SPM input variable – SNAP receipt. Instead of using the CPS self-reported SNAP benefit amounts, we use administrative records of SNAP benefit amounts, as well as TRIM3 benefit amounts. For false positives (observations that report SNAP receipt in the survey data but did not receive SNAP according to administrative records or TRIM3 data), we change their benefit amount to $0 based on the administrative records or TRIM3 data. We calculate the overall SPM using the administrative records and TRIM3 data, and compare these rates to the SPM estimate calculated using the CPS ASEC self-report for the states mentioned.

We find in Table 5 that, compared with SPM rates estimated using administrative records, using self-reported SNAP benefits from the CPS ASEC overestimates the overall SPM rate by 0.4 percentage points, while using TRIM3 SNAP data underestimates the SPM rate by 0.5 percentage points in the pooled sample (11.9 percent using administrative records vs 12.4 percent using CPS ASEC and 11.5 percent using TRIM3 SNAP). We find that the SPM rates for most subgroups of the population are overestimated using self-reported data from CPS ASEC and underestimated using TRIM3 SNAP data.[25, 26] Examining SPM rates for children under age 18, we find a 12.5 percent SPM poverty rate using state administrative SNAP records.

The SPM rate captures the percentage of people or units below a set threshold, but does not give information on the depth of poverty. Lastly, we look at the magnitude of poverty by

[24] For this paper, we only substitute TRIM3 values for SNAP into the SPM poverty rates and gaps. The SPM poverty rates and gaps do not include TRIM3-adjusted values for any other programs or for taxes.
[25] The subgroups without a statistically significant change when using administrative records (compared to CPS ASEC data) are individuals in Idaho; individuals in units with a single, male reference person; individuals with a bachelor's degree or higher; and individuals with a positive SNAP benefit amount in the CPS ASEC.
[26] The subgroups without a statistically significant change when using TRIM3 data (compared to administrative records) are individuals in a unit with unrelated individuals, naturalized citizens, individuals with a disability, and individuals with a positive SNAP benefit amount in the administrative records.

calculating the SPM poverty gap using the administrative records, CPS ASEC, and TRIM3. Figure 5 shows the average poverty gap at different percentages of poverty by data source – 50 percent (deep poverty), 100 percent (poverty), and 150 percent of poverty (near poverty).[27] We find that the average poverty gap for the CPS ASEC appears to be slightly higher than for the administrative records at all of the percentages of poverty, however the difference is not statistically significant. The average poverty gap for TRIM3 is lower than for the administrative records at poverty and near poverty and the average poverty gap for TRIM3 appears to be lower than for the administrative records at deep poverty but is not statistically significant.[28]

Table 6 reports the total poverty gaps for the CPS ASEC and TRIM3 as a percentage of the total poverty gap from administrative records at 50 percent, 100 percent, and 150 percent of poverty. Overall, we find that the total poverty gap at 100 percent of poverty for the CPS ASEC as a percentage of administrative records poverty gap is 102.9 percent.[29] The TRIM total poverty gap as a percentage of administrative records gap, however, is significantly lower at 92.1 percent. Comparing the total poverty gap for TRIM3 to administrative records for all SPM units, TRIM3 appears to be over-allocating SNAP benefits to those with income below 100 percent of the SPM poverty threshold.[30]

So who do these reporting discrepancies really affect in terms of SPM poverty rates and gaps? Those who do receive SNAP according to state administrative records (e.g. those eligible and receiving SNAP due to living in and near poverty) have an SPM rate that is 2.4 percentage

[27] The average poverty gap is defined as the average amount of money needed to lift a unit in poverty to the specified percentage of poverty.
[28] The average poverty gap is significantly higher for the CPS ASEC than for TRIM3 at all of the percentages of poverty.
[29] The total povery gap for the CPS ASEC as a percentage of the administrative records poverty gap is not statistically different from 100 percent.
[30] The deep poverty gap for TRIM3 as a percentage of the administrative records deep poverty gap is not statistically significant.

points lower and a SPM average poverty gap that appears to be $729 lower when calculating the SPM using SNAP administrative records instead of the CPS ASEC.[31] Among the SNAP recipients according to administrative records, the SPM rate appears to be 0.2 percentage points lower and the SPM average poverty gap appears to be $344 lower using TRIM3 data than using administrative records.[32]

CONCLUSION

CPS ASEC self-reported SNAP participation differs from state administrative records for all seven states in our sample. In our pooled sample, 46 percent of SNAP recipients do not report their receipt on the CPS survey, compared to 36 percent in TRIM3. Underreporting of SNAP participation in the CPS ASEC inflates the SPM rate by 0.4 percentage points (from 11.9 to 12.4 percent in our pooled sample). Over allocating SNAP receipt to units in poverty in TRIM3 reduces the SPM rate by 0.5 percentage points (11.9 percent to 11.5 percent in our pooled sample).[33]

Our analysis highlights the need to reduce false negatives in self-reported SNAP receipt and in SNAP modeling efforts. Our results are consistent with prior studies that have also found underreporting of SNAP participation in household survey data. Using administrative records is a possible method to more accurately identify those individuals who received SNAP in the prior year and should be seriously considered as a robust alternative and resource for alternative poverty estimation. An alternative method is to use a microsimulation model to adjust for the

[31] The difference in SPM average poverty gap between the CPS ASEC and administrative records for those who receive SNAP according to administrative records is not statistically significant.
[32] The differences in SPM poverty rates and average poverty gap between TRIM3 and administrative records for those who receive SNAP according to administrative records are not statistically significant.
[33] Differences exist due to rounding.

underreporting of SNAP in the CPS ASEC. However, it appears that in the case of TRIM3, it over-allocates SNAP benefits to those in poverty.

As this project moves forward, we will focus on adding administrative records from other program areas (e.g. Temporary Assistance to Needy Families (TANF), Women, Infant, and Children (WIC) Program, Low Income Home Energy Assistance Program (LIHEAP)) into our curated dataset and re-estimating the SPM.

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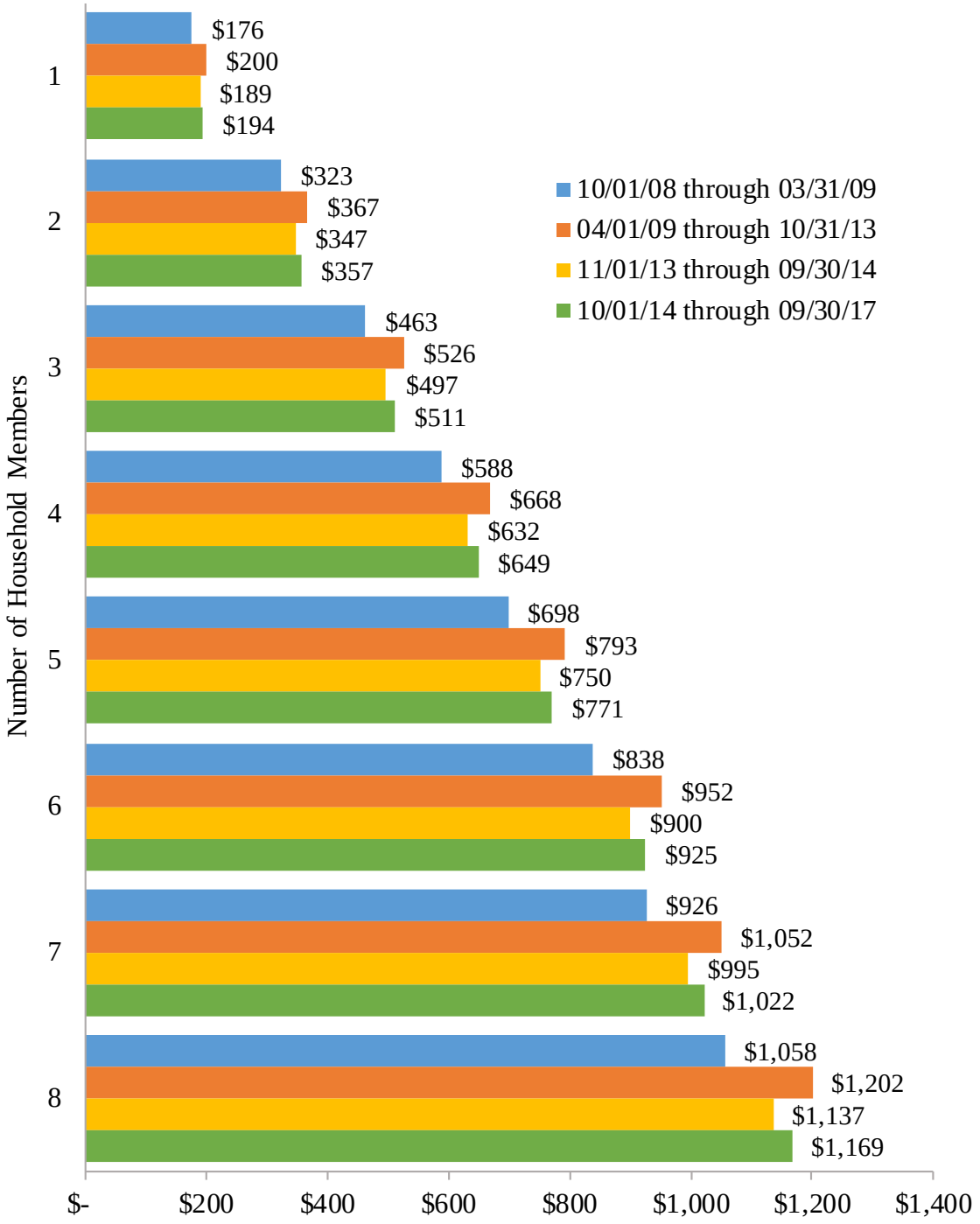
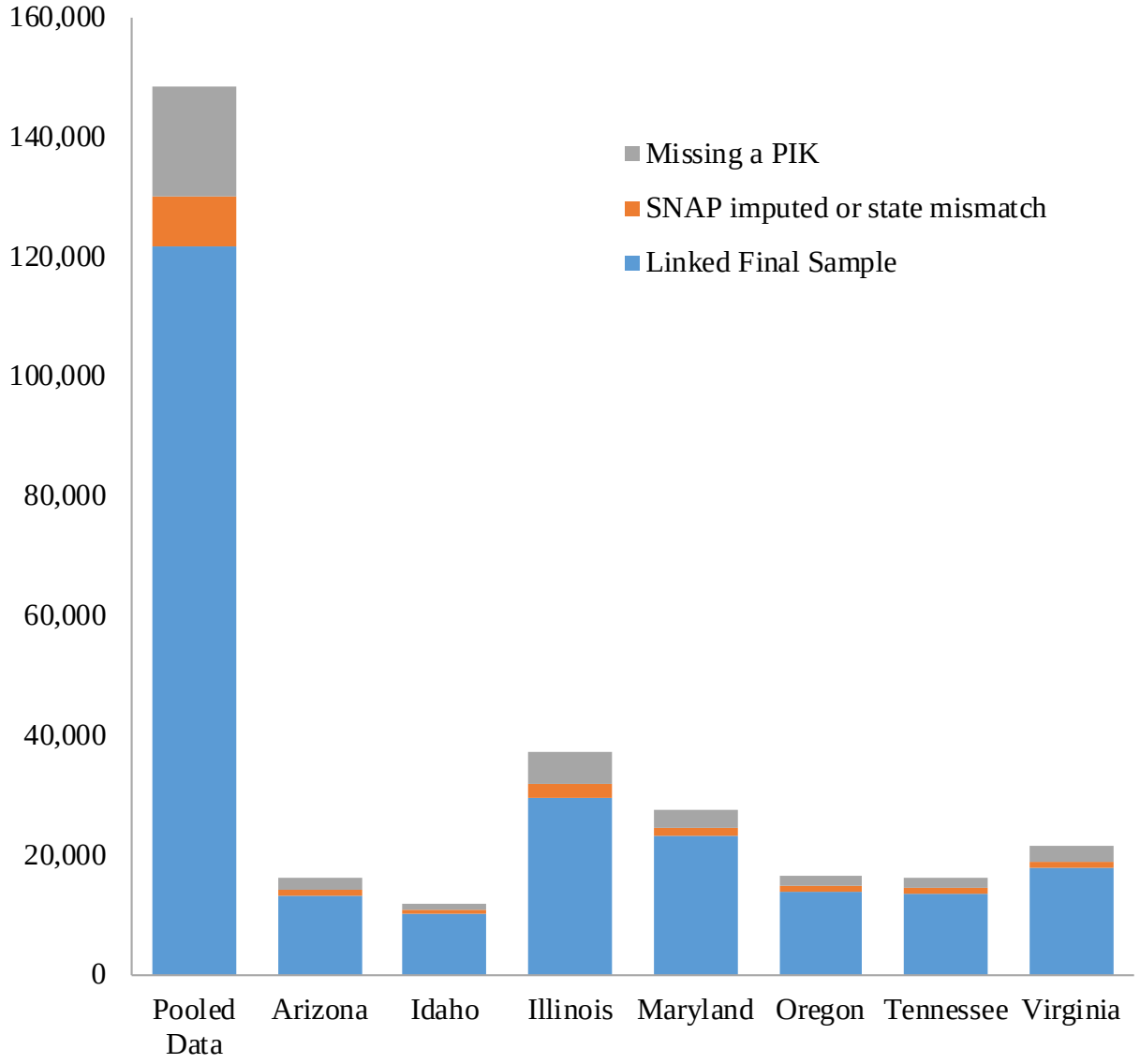
Figure 1. Maximum Monthly SNAP Benefit Amount for FFY 2009 through 2017



Source: USDA 2017a.

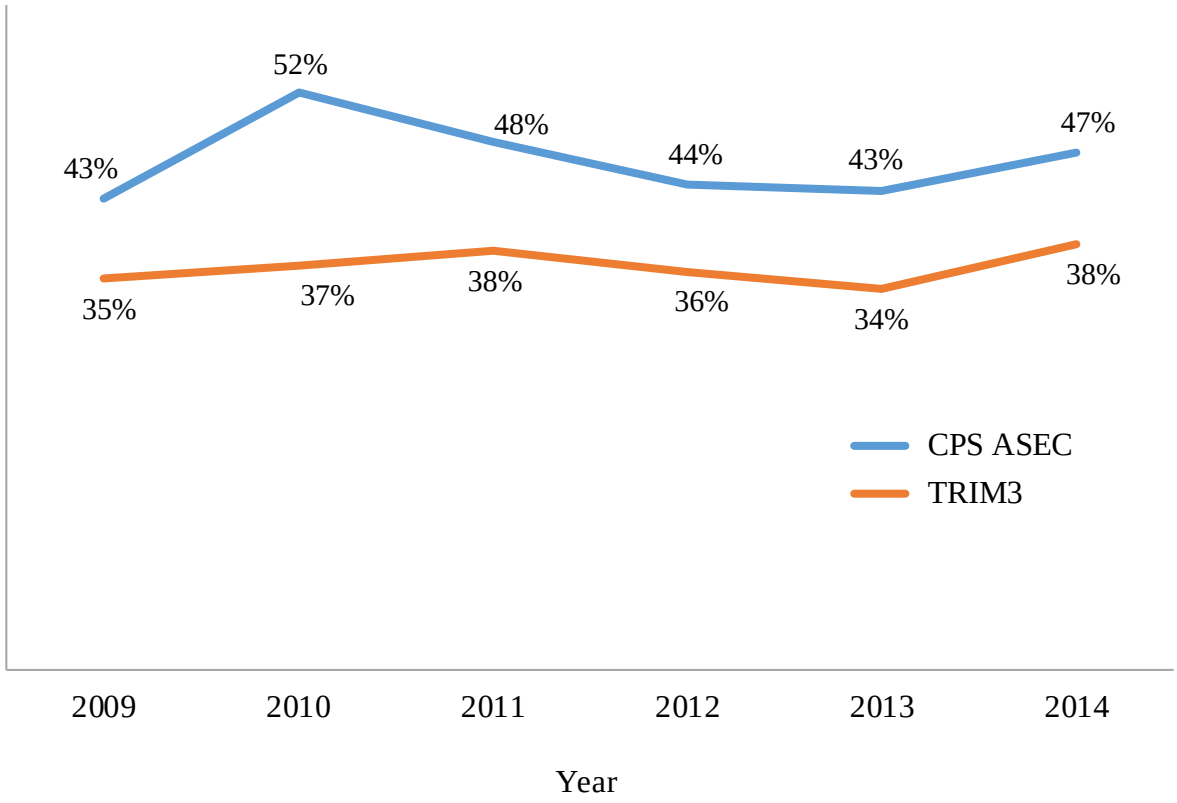
Note: This figure shows the maximum monthly SNAP benefit amounts for the 48 contiguous states and the District of Columbia. For the maximum monthly SNAP benefit amounts for Alaska, Hawaii, Guam, or the U.S. Virgin Islands, see https://www.fns.usda.gov/snap/cost-living-adjustment-cola-information.

Figure 2. CPS ASEC / SNAP Administrative Record Linkage Process



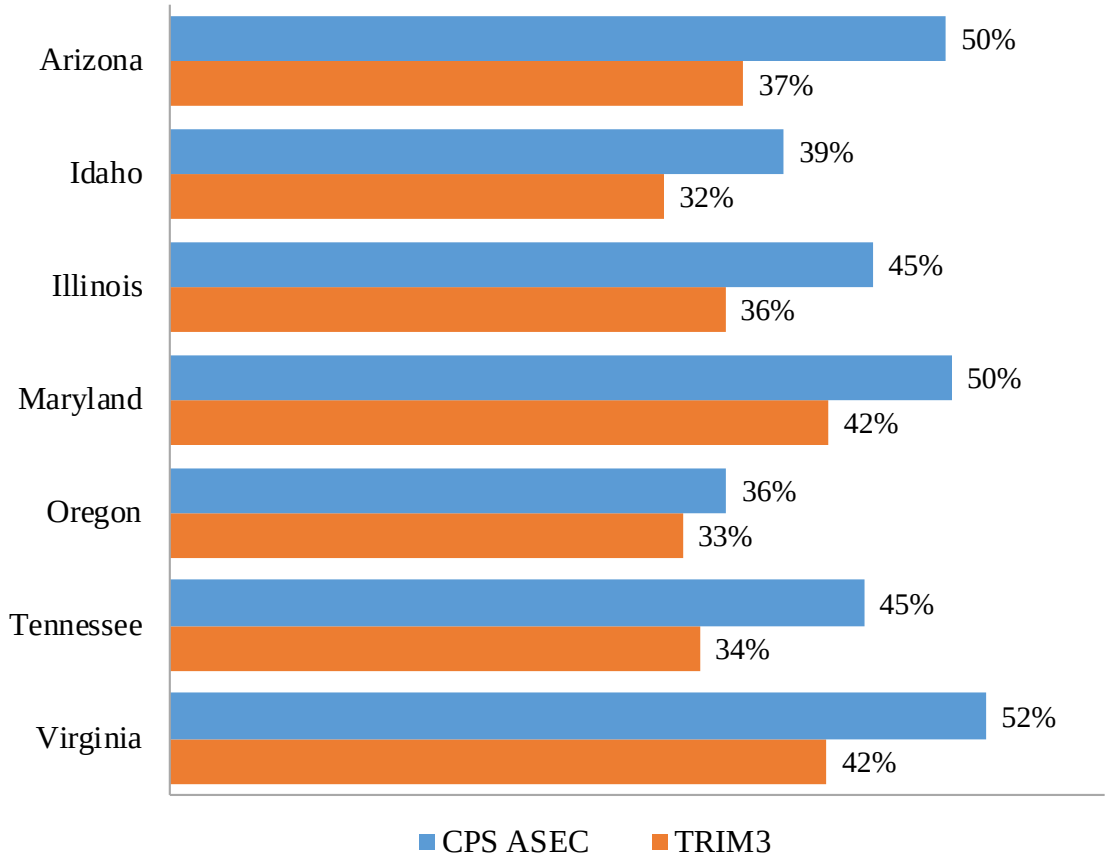
Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Figure 3. Percent of False Negatives by Year, Pooled Sample 2009-2014



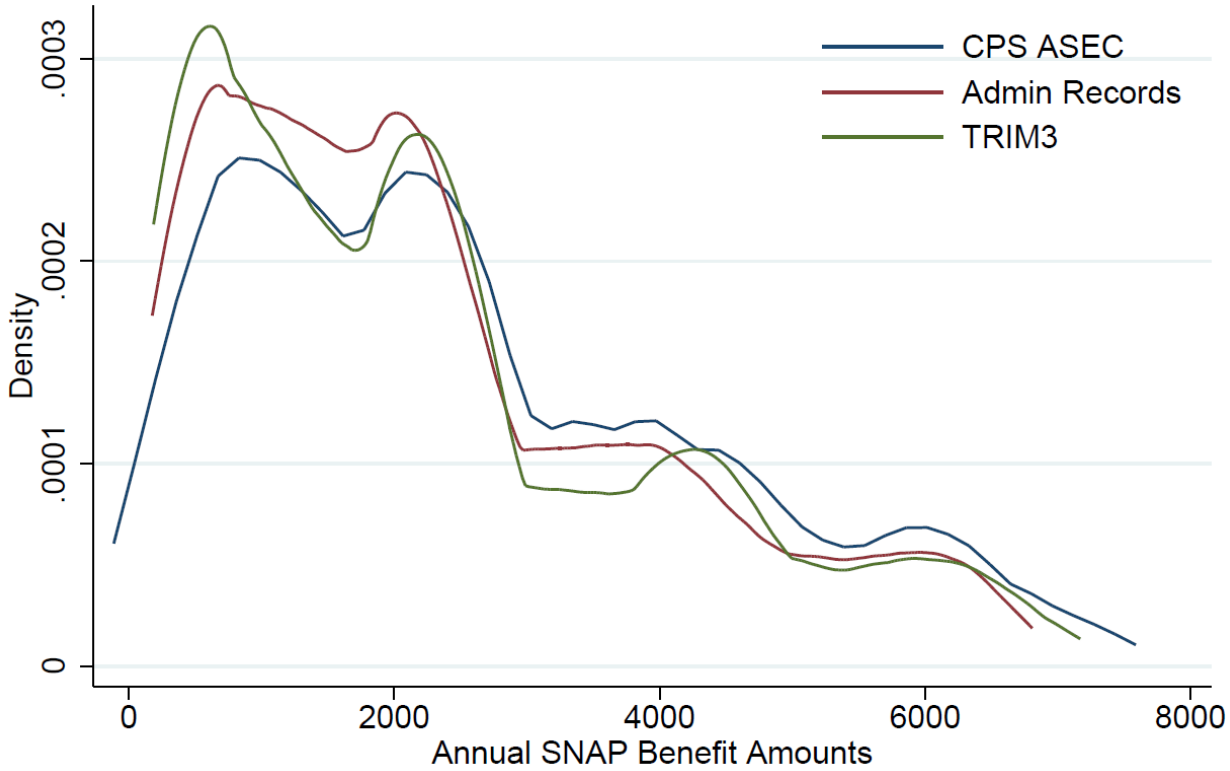
Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using inverse probability weighting (IPW) and excluding imputed SNAP. The unit of analysis is the CPS household. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Figure 4. Percent of False Negatives by State, 2009-2014



Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW and excluding imputed SNAP. The unit of analysis is the CPS household. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

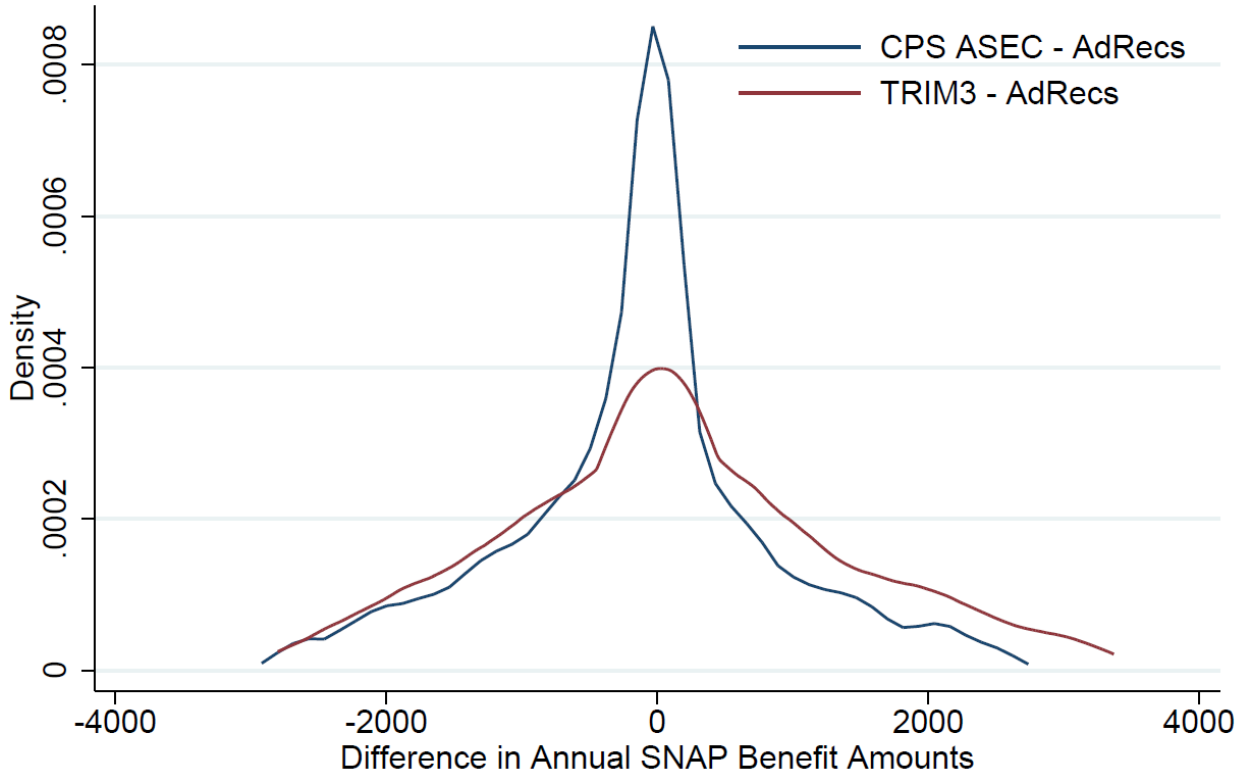
Figure 5. Kernel Density Plot of Annual SNAP Benefit Amounts by Data Source, Pooled Sample 2009-2014



Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.

Note: Adjusted using IPW, excluding imputed SNAP, and excluding the top and bottom five percent of observations. The kernel density plots have a bandwidth of 50 observations. The unit of analysis is the SPM unit. Values are conditional on positive SNAP benefits in each data source. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

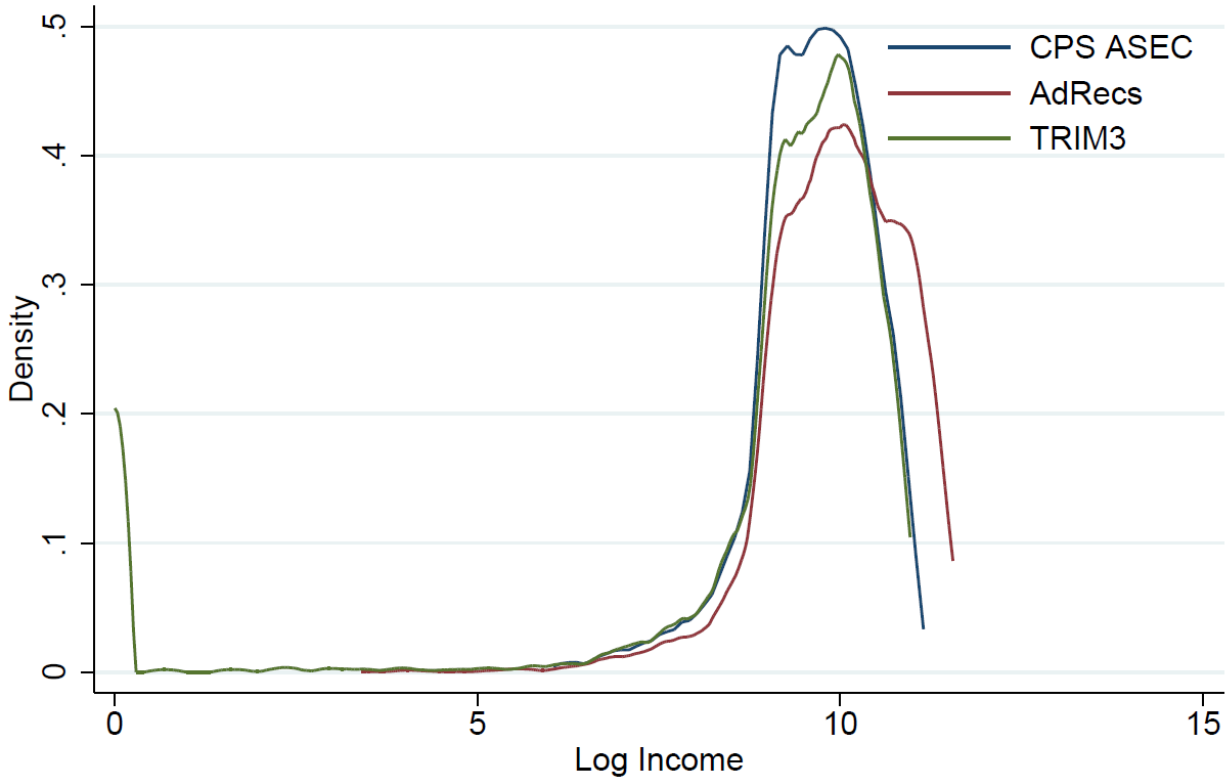
Figure 6. Kernel Density Plot of Difference in Annual SNAP Benefit Amounts in the Data Sources for True Positives, Pooled Sample 2009-2014



Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.

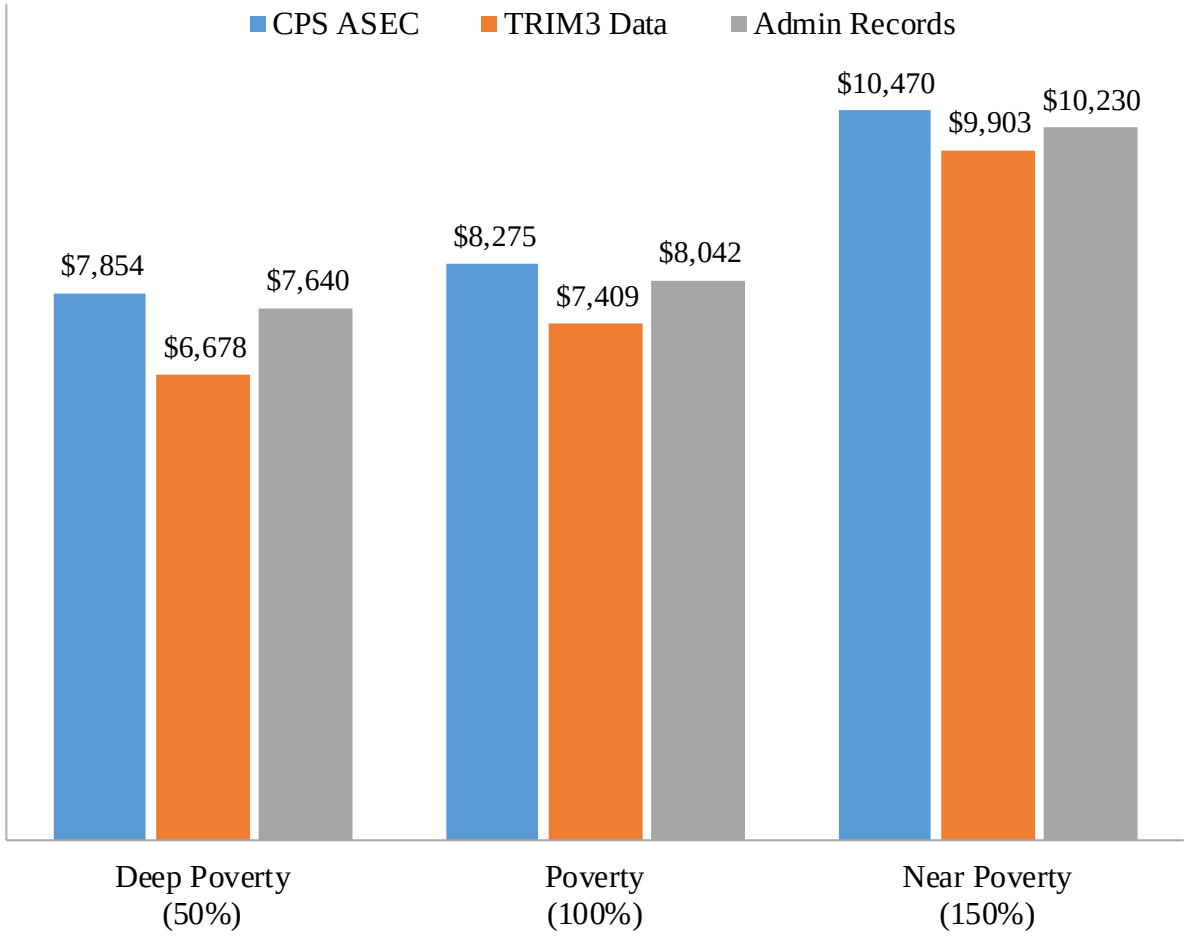
Note: Adjusted using IPW, excluding imputed SNAP, and excluding the top and bottom five percent of observations. The kernel density plots have a bandwidth of 50 observations. The unit of analysis is the SPM unit. Values are conditional on positive SNAP benefits in both data sources for each difference. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Figure 7. Kernel Density Plot of Logged Total CPS ASEC Income for SNAP Recipients According to Each Data Source, Pooled Sample 2009-2014



Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW, excluding imputed SNAP, and excluding the top and bottom five percent of observations. The kernel density plots have a bandwidth of 50 observations. The unit of analysis is the SPM unit. Values are conditional on positive SNAP benefits in each data source. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Figure 8. Average Poverty Gap by Data Source, Pooled Sample 2009-2014



Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW and excluding imputed SNAP. The unit of analysis is the SPM unit. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Table 1. Number of Individual Persons in Sample by Year and State

	Pooled sample	Arizona	Idaho	Illinois	Maryland	Oregon	Tennessee	Virginia
2009	20,139	2,269	–	5,239	4,183	2,448	2,276	3,724
2010	21,457	2,305	2,006	4,949	4,087	2,416	2,169	3,525
2011	21,754	2,194	2,086	5,192	4,166	2,247	2,260	3,609
2012	20,778	2,040	1,907	4,743	4,069	2,236	2,180	3,603
2013	20,703	2,078	2,003	4,850	3,897	2,293	2,124	3,458
2014	16,867	2,482	2,265	4,573	2,864	2,217	2,466	–
Total	121,698	13,368	10,267	29,546	23,266	13,857	13,475	17,919

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.

Note: This final sample of individual persons excludes observations missing a PIK, imputed SNAP, and linkages with mismatched states. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Table 2A. Misreporting in SNAP Benefits: CPS ASEC vs. Administrative Records, Pooled Sample 2009-2014

Administrative Records	CPS ASEC Data: Not Received	CPS ASEC Data: Received	N
Not Received	99.5%	0.5%	39,138
Received	45.9%	54.1%	7,465

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW and excluding imputed SNAP. The unit of analysis is the CPS household. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Table 2B. Misreporting in SNAP Benefits: TRIM3 vs. Administrative Records, Pooled Sample 2009-2014

Administrative Records	TRIM3 Data: Not Received	TRIM3 Data: Received	N
Not Received	92.3%	7.7%	39,138
Received	36.4%	63.6%	7,465

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW and excluding imputed SNAP. The unit of analysis is the CPS household. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Table 3A. Underreporting of SNAP Benefit Amounts in the CPS ASEC, Pooled Sample 2009-2014

	CPS ASEC	Admin Records	Difference [CPS – Admin]
Rate of SNAP receipt	9.1%	16.0%	-6.9%
	(0.002)	(0.002)	(0.001)
Average annual SNAP benefit	$2,928	$3,008	-$80
	(46.61)	(43.36)	(33.69)

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW and excluding imputed SNAP. The unit of analysis is the CPS household. Average SNAP benefit values are conditional on positive SNAP benefits in both data sources. Standard errors are shown in parentheses. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Table 3B. Underreporting of SNAP Benefit Amounts in TRIM3, Pooled Sample 2009-2014

	TRIM3	Admin Records	Difference [TRIM3 – Admin]
Rate of SNAP receipt	16.6%	16.0%	0.6%
	(0.002)	(0.002)	(0.002)
Average annual SNAP benefit	$3,060	$2,932	$128
	(43.16)	(39.61)	(30.40)

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW and excluding imputed SNAP. The unit of analysis is the CPS household. Average SNAP benefit values are conditional on positive SNAP benefits in both data sources. Standard errors are shown in parentheses. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Table 4. Characteristics of Misreporting, Regression Results: Pooled Sample 2009-2014

	Unreported SNAP Receipt in the CPS ASEC	Under Imputed SNAP Receipt in TRIM3	Underreported SNAP Annual Amount in the CPS ASEC	Underestimated SNAP Annual Amount in TRIM3
Log of total income	-0.180***	-0.197***	31.9	499.6***
	(0.009)	(0.008)	(69.9)	(50.6)
Log of total income squared	0.017***	0.022***	-4.8	-60.0***
	(0.001)	(0.001)	(6.6)	(4.9)
Number of kids in unit	-0.040***	-0.053***	-200.1***	125.2***
	(0.005)	(0.004)	(42.1)	(34.9)
Native born unit head		(omitted)		
Foreign born unit head	0.005	0.024	-6.3	-212.7
	(0.020)	(0.018)	(146.2)	(123.8)
Unit head with less than H.S. diploma		(omitted)		
Unit head with H.S. diploma or GED	-0.024	-0.009	-94.1	53.4
	(0.016)	(0.014)	(94.0)	(77.7)
Unit head with some college	-0.012	0.006	-44.2	51.3
	(0.014)	(0.013)	(80.9)	(76.4)
Unit head with bachelor's degree	-0.008	0.012	-103.9	156.3
	(0.021)	(0.019)	(122.7)	(138.0)
Unit head is under 25 years old	0.063**	0.057**	293.2*	253.7*
	(0.021)	(0.018)	(134.1)	(101.6)
Owner with mortgage		(omitted)		
Owner with no mortgage	0.011	0.040*	136.7	-366.0***
	(0.018)	(0.016)	(106.0)	(101.9)
Renter	-0.033*	0.005	152.9	-202.8*
	(0.015)	(0.013)	(82.8)	(86.6)
Inside principal cities		(omitted)		
Outside principal cities (within MSA)	-0.019	-0.003	124.5	-32.9
	(0.013)	(0.012)	(81.0)	(70.2)

Table 4. Characteristics of Misreporting, Regression Results: Pooled Sample 2009-2014 (con't.)

	Unreported SNAP Receipt in the CPS ASEC	Under Imputed SNAP Receipt in TRIM3	Underreported SNAP Annual Amount in the CPS ASEC	Underestimated SNAP Annual Amount in TRIM3
Outside MSA	-0.043**	-0.015	-109.3	-61.1
	(0.016)	(0.014)	(81.3)	(77.1)
Unit head with private insurance		(omitted)		
Unit head with public, no private insurance	-0.221***	-0.125***	41.2	-342.4***
	(0.016)	(0.015)	(95.1)	(83.9)
Unit head without insurance	-0.040*	-0.073***	-67.4	-84.1
	(0.016)	(0.015)	(122.6)	(91.3)
Unit head worked full-time, year-round		(omitted)		
Unit head worked less than full-time, year-round	-0.134***	-0.224***	-302.1**	28.0
	(0.015)	(0.014)	(112.7)	(94.1)
Unit head did not work	-0.082***	-0.141***	-102.7	272.0*
	(0.018)	(0.016)	(130.9)	(109.3)
Unit head is not working age	-0.053*	-0.113***	10.1	224.2
	(0.022)	(0.020)	(153.5)	(115.9)
Unit head does not have a disability		(omitted)		
Unit head has a disability	-0.107***	-0.074***	10.6	-144.8
	(0.017)	(0.015)	(91.2)	(77.2)
Number of SPM units	8063	8063	4281	5057

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and Virginia cover calendar years 2009–2013.

*Notes: * p<0.10, ** p<0.05, *** p<0.01. State- and year-level fixed effects included. We also control for the type of SPM unit and race/ethnicity of the SPM unit head. Adjusted using IPW, excluding imputed SNAP values, and standard errors are clustered by PIK. The unit of analysis is the SPM unit. The omitted category indicates the benchmark group against which comparisons can be made. Probability of reporting is a linear probability model estimating the probability of a benefit amount of zero in CPS ASEC conditional*

on positive values in administrative records. Predicted difference in reporting is an ordinary least squares model predicting the difference between monthly administrative and CPS ASEC reported SNAP values (CPS ASEC – admin records) conditional on positive values in both CPS ASEC and administrative records. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Table 5. Percent of People in Poverty by Different Sources of SNAP Values: Pooled Sample 2009-2015

Characteristic	Weighted Number (in thousands)	SPM Using CPS Reported SNAP		SPM Using TRIM3 Reported SNAP		SPM Using Admin SNAP		Difference (CPS - Admin)		Difference (TRIM3 - Admin)	
		Estimate	MOE	Estimate	MOE	Estimate	MOE				
All SPM Units	238,997	12.4	0.2	11.5	0.2	11.9	0.2	0.4	*	-0.5	*
Arizona	37,308	17.7	0.6	16.4	0.6	17.2	0.6	0.6	*	-0.8	*
Idaho	7,682	9.4	0.5	8.8	0.5	9.6	0.6	-0.1		-0.8	*
Illinois	67,234	11.7	0.4	10.7	0.3	11.3	0.3	0.4	*	-0.7	*
Maryland	33,066	10.7	0.4	10.0	0.4	10.4	0.4	0.3	*	-0.3	*
Oregon	21,957	11.4	0.5	10.9	0.5	11.1	0.5	0.3	*	-0.2	*
Tennessee	34,988	13.4	0.6	12.5	0.5	12.9	0.6	0.6	*	-0.4	*
Virginia	36,762	9.9	0.4	9.1	0.4	9.3	0.4	0.6	*	-0.2	*
Male	117,732	11.9	0.3	11.0	0.3	11.4	0.3	0.4	*	-0.5	*
Female	121,266	12.9	0.3	12.0	0.3	12.4	0.3	0.5	*	-0.5	*
Under 18 years	56,254	13.3	0.4	11.5	0.4	12.5	0.4	0.8	*	-1.0	*
18 to 64 years	150,970	11.9	0.2	11.2	0.2	11.5	0.2	0.4	*	-0.3	*
65 years and older	31,773	12.9	0.5	12.7	0.5	12.8	0.5	0.1	*	-0.1	*
Married couple unit	152,790	7.8	0.2	7.1	0.2	7.5	0.2	0.3	*	-0.3	*
Cohabiting partner unit	18,142	16.1	0.8	14.2	0.8	15.3	0.8	0.8	*	-1.1	*
Female reference person unit	27,553	23.7	0.7	21.4	0.7	22.4	0.7	1.3	*	-1.1	*
Male reference person unit	9,724	15.4	1.0	13.8	1.0	15.2	1.0	0.2		-1.4	*
Unrelated individuals	30,788	22.0	0.7	21.7	0.7	21.7	0.7	0.3	*	0.0	

Table 5. Percent of People in Poverty by Different Sources of SNAP Values: Pooled Sample 2009-2015 (con't.)

Characteristic	Weighted Number (in thousands)	SPM Using CPS Reported SNAP		SPM Using TRIM3 Reported SNAP		SPM Using Admin SNAP		Difference (CPS - Admin)		Difference (TRIM3 - Admin)	
		Estimate	MOE	Estimate	MOE	Estimate	MOE				
White	186,755	11.1	0.2	10.3	0.2	10.8	0.2	0.3	*	-0.5	*
White, not Hispanic	157,807	9.0	0.2	8.5	0.2	8.8	0.2	0.2	*	-0.4	*
Black	32,549	17.9	0.6	16.5	0.6	17.0	0.6	0.9	*	-0.5	*
Asian	10,957	12.9	0.9	12.4	0.9	12.8	0.9	0.2	*	-0.3	*
Hispanic (any race)	32,382	22.3	0.6	20.1	0.6	21.1	0.6	1.2	*	-1.0	*
Native born	211,714	11.5	0.2	10.6	0.2	11.0	0.2	0.4	*	-0.5	*
Foreign born	27,283	19.5	0.7	18.5	0.7	18.9	0.7	0.6	*	-0.4	*
Naturalized citizen	12,008	13.2	0.8	12.5	0.8	12.7	0.8	0.5	*	-0.3	
Not a citizen	15,276	24.5	1.0	23.3	1.0	23.8	1.0	0.7	*	-0.5	*
Total, aged 25 and older	160,640	11.4	0.2	10.8	0.2	11.0	0.2	0.3	*	-0.3	*
No high school diploma	16,698	29.9	1.0	28.0	1.0	28.6	1.0	1.3	*	-0.6	*
High school, no college	45,135	14.4	0.5	13.5	0.5	13.9	0.5	0.4	*	-0.4	*
Some college, no degree	43,011	9.7	0.4	9.3	0.4	9.4	0.4	0.2	*	-0.1	*
Bachelor's degree or higher	55,796	4.7	0.3	4.5	0.3	4.7	0.3	0.0		-0.1	*
Owner	169,649	7.9	0.2	7.4	0.2	7.8	0.2	0.2	*	-0.3	*
Owner/mortgage	120,509	6.4	0.2	5.9	0.2	6.3	0.2	0.1	*	-0.3	*
Owner/no mortgage/rent free	51,615	12.1	0.4	11.5	0.4	11.9	0.4	0.2	*	-0.3	*
Renter	66,874	23.4	0.5	21.4	0.5	22.2	0.5	1.2	*	-0.8	*
Inside MSAs	204,766	12.2	0.2	11.4	0.2	11.8	0.2	0.5	*	-0.4	*
Inside principal cities	75,951	16.4	0.4	15.1	0.4	15.6	0.4	0.8	*	-0.5	*
Outside principal cities	128,815	9.8	0.2	9.2	0.2	9.5	0.2	0.2	*	-0.4	*
Outside MSAs	34,231	13.4	0.5	12.0	0.5	13.0	0.5	0.4	*	-1.0	*

Table 5. Percent of People in Poverty by Different Sources of SNAP Values: Pooled Sample 2009-2015 (con't.)

Characteristic	Weighted Number (in thousands)	SPM Using CPS Reported SNAP Estimate	SPM Using CPS Reported SNAP MOE	SPM Using TRIM3 Reported SNAP Estimate	SPM Using TRIM3 Reported SNAP MOE	SPM Using Admin SNAP Estimate	SPM Using Admin SNAP MOE	Difference (CPS - Admin)	Difference (TRIM3 - Admin)
With private insurance	164,871	5.9	0.2	5.5	0.2	5.8	0.2	0.1 *	-0.3 *
With public, no private insurance	45,733	26.9	0.6	24.6	0.6	25.7	0.6	1.2 *	-1.1 *
Not insured	28,392	26.7	0.7	25.0	0.7	25.7	0.7	1.0 *	-0.7 *
Total 18 to 64 years	150,970	11.9	0.2	11.2	0.2	11.5	0.2	0.4 *	-0.3 *
All workers	117,629	7.4	0.2	6.8	0.2	7.1	0.2	0.2 *	-0.3 *
Worked full-time, year-round	80,688	4.0	0.2	3.7	0.2	3.8	0.2	0.2 *	-0.1 *
Less than full-time, year-round	36,941	14.6	0.5	13.5	0.5	14.3	0.5	0.3 *	-0.8 *
Did not work at least 1 week	33,341	28.0	0.7	26.7	0.7	27.2	0.7	0.8 *	-0.4 *
Total 18 to 64 years	150,970	11.9	0.2	11.2	0.2	11.5	0.2	0.4 *	-0.3 *
With a disability	10,735	24.2	1.2	23.2	1.2	23.1	1.2	1.1 *	0.1
With no disability	139,248	11.0	0.2	10.3	0.2	10.7	0.2	0.3 *	-0.4 *
Non-zero SNAP benefit amount in CPS	25,835	37.3	0.8	35.4	0.8	37.0	0.8	0.2	-1.7 *
Non-zero SNAP benefit amount in Admin Records	47,607	30.2	0.6	27.7	0.6	27.8	0.6	2.4 *	-0.2
Non-zero SNAP benefit amount in TRIM Data	43,810	44.4	0.6	39.1	0.6	42.7	0.6	1.6 *	-3.6 *

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.

*Note: * p<0.10. Adjusted using IPW, excluding imputed SNAP values, and standard errors are clustered by PIK. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.*

Table 6. Total Poverty Gap as a Percentage of Total Poverty Gap from Administrative Records by Data Sources and Level of Poverty: Pooled Sample 2009-2015

Characteristic	Weighted Number (in thousands)	Deep Poverty (50%)		Poverty (100%)		Near Poverty (150%)	
		CPS ASEC	TRIM3	CPS ASEC	TRIM3	CPS ASEC	TRIM3
All SPM Units	13,251	102.8%	87.4%	102.9%	92.1%	102.4%	96.8%
Arizona	2,767	105.3%	85.7%	103.4%	92.1%	102.3%	96.6%
Idaho	333	99.9%	84.9%	99.3%	88.2%	100.6%	93.5%
Illinois	3,496	102.2%	84.7%	102.4%	90.2%	102.3%	96.2%
Maryland	1,642	102.3%	86.6%	102.5%	93.2%	102.1%	97.6%
Oregon	1,148	101.4%	85.7%	104.4%	92.5%	103.0%	97.6%
Tennessee	2,176	102.6%	92.9%	103.7%	94.6%	103.1%	97.6%
Virginia	1,689	102.5%	87.2%	102.0%	92.1%	101.9%	96.9%
Male	6,109	102.5%	87.9%	102.6%	92.5%	102.1%	96.8%
Female	7,142	103.2%	86.9%	103.1%	91.8%	102.6%	96.9%
Under 18 years	220	102.4%	78.2%	100.0%	90.3%	99.5%	96.0%
18 to 64 years	10,010	103.2%	87.4%	103.2%	91.8%	102.7%	96.6%
65 years and older	3,021	101.3%	88.3%	101.7%	93.7%	101.2%	97.9%
Married couple unit	3,461	102.1%	88.3%	102.6%	91.9%	102.3%	96.8%
Cohabiting partner unit	825	101.7%	80.3%	106.4%	89.8%	103.7%	95.8%
Female reference person unit	1,977	105.9%	79.2%	104.2%	88.5%	103.9%	95.9%
Male reference person unit	508	105.2%	81.5%	105.5%	90.2%	104.1%	96.5%
Unrelated individuals	6,481	102.5%	90.0%	101.7%	94.5%	101.0%	97.7%

Table 6. Total Poverty Gap as a Percentage of Total Poverty Gap from Administrative Records by Data Sources and Level of Poverty: Pooled Sample 2009-2015 (con't.)

Characteristic	Weighted Number (in thousands)	Deep Poverty (50%)		Poverty (100%)		Near Poverty (150%)	
		CPS ASEC	TRIM3	CPS ASEC	TRIM3	CPS ASEC	TRIM3
White	9,617	101.9%	87.9%	102.2%	91.8%	101.9%	96.4%
White, not Hispanic	7,446	101.4%	88.6%	101.9%	91.8%	101.5%	96.1%
Black	2,484	106.7%	83.7%	106.2%	92.8%	104.5%	98.3%
Asian	622	104.5%	93.2%	102.3%	95.4%	101.6%	98.0%
Hispanic (any race)	2,408	104.4%	83.9%	103.2%	91.6%	102.6%	97.0%
Native born	10,601	102.7%	87.0%	102.9%	91.5%	102.4%	96.4%
Foreign born	2,650	103.4%	89.4%	102.9%	94.3%	102.3%	98.1%
Naturalized citizen	844	103.2%	84.7%	103.1%	93.3%	102.3%	98.0%
Not a citizen	1,806	103.5%	91.5%	102.9%	94.7%	102.4%	98.1%
Total, aged 25 and older	11,401	102.5%	87.6%	102.9%	92.2%	102.5%	97.0%
No high school diploma	2,948	105.9%	84.3%	104.1%	92.5%	102.9%	97.4%
High school, no college	3,796	102.5%	90.1%	103.1%	92.2%	102.7%	97.1%
Some college, no degree	2,812	102.0%	85.2%	102.8%	91.4%	102.6%	96.8%
Bachelor's degree or higher	1,845	100.7%	88.5%	101.2%	92.6%	101.2%	96.5%
Owner	5,914	101.6%	88.1%	102.2%	92.3%	101.8%	96.6%
Owner/mortgage	2,982	102.1%	85.8%	102.5%	91.9%	102.0%	96.7%
Owner/no mortgage/rent free	3,264	101.2%	89.2%	101.9%	92.7%	101.6%	96.5%
Renter	7,005	104.6%	86.7%	103.6%	92.0%	102.9%	97.0%
Inside MSAs	11,239	103.0%	86.7%	102.8%	92.2%	102.3%	97.0%
Inside principal cities	5,744	104.3%	87.1%	103.8%	92.7%	102.9%	97.2%
Outside principal cities	5,495	101.7%	86.4%	101.9%	91.7%	101.7%	96.9%
Outside MSAs	2,012	102.1%	90.3%	103.3%	91.6%	102.9%	95.5%

Table 6. Total Poverty Gap as a Percentage of Total Poverty Gap from Administrative Records by Data Sources and Level of Poverty: Pooled Sample 2009-2015 (con't.)

Characteristic	Weighted Number (in thousands)	Deep Poverty (50%)		Poverty (100%)		Near Poverty (150%)	
		CPS ASEC	TRIM3	CPS ASEC	TRIM3	CPS ASEC	TRIM3
With private insurance	4,904	101.0%	88.1%	101.4%	92.5%	101.9%	96.9%
With public, no private insurance	4,638	103.3%	87.6%	103.5%	92.3%	102.3%	97.4%
Not insured	3,709	105.1%	86.3%	104.2%	91.4%	103.2%	96.0%
Total 18 to 64 years	10,010	103.2%	87.4%	103.2%	91.8%	102.7%	96.6%
All workers	5,069	101.6%	88.7%	103.5%	91.4%	103.3%	96.8%
Worked full-time, year-round	1,860	101.2%	93.7%	103.9%	93.7%	103.7%	98.9%
Less than full-time, year-round	3,208	101.9%	84.9%	103.2%	90.1%	102.9%	95.2%
Did not work at least 1 week	4,941	104.0%	86.8%	103.1%	92.1%	102.0%	96.4%
Total 18 to 64 years	10,010	103.2%	87.4%	103.2%	91.8%	102.7%	96.6%
With a disability	1,697	102.4%	86.7%	101.7%	93.2%	101.2%	97.7%
With no disability	8,278	103.3%	87.7%	103.5%	91.7%	102.9%	96.5%
Non-zero SNAP benefit amount in CPS	3,320	94.9%	83.7%	99.1%	91.7%	99.9%	97.7%
Non-zero SNAP benefit amount in Admin Records	4,864	113.7%	91.0%	109.8%	95.4%	106.8%	100.3%
Non-zero SNAP benefit amount in TRIM Data	7,440	104.0%	73.7%	103.6%	85.2%	102.7%	92.6%

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.

Note: Adjusted using IPW, excluding imputed SNAP values, and standard errors are clustered by PIK. The unit of analysis is the SPM unit. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Appendix Table 1. Number of CPS Households in Sample by Year and State

	Pooled sample	Arizona	Idaho	Illinois	Maryland	Oregon	Tennessee	Virginia
2009	7,789	880	–	2,020	1,617	938	894	1,440
2010	8,127	866	677	1,892	1,555	915	853	1,369
2011	8,192	830	706	1,971	1,544	889	892	1,360
2012	8,002	791	676	1,874	1,533	876	871	1,381
2013	7,956	807	699	1,884	1,516	867	840	1,343
2014	6,537	959	827	1,796	1,078	867	1,010	–
Total	46,603	5,133	3,585	11,437	8,843	5,352	5,360	6,893

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.

Note: The final sample of CPS households excludes observations missing a PIK, imputed SNAP, and linkages with mismatched states. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Appendix Table 2. Number of SPM Units in Sample by Year and State

	Pooled sample	Arizona	Idaho	Illinois	Maryland	Oregon	Tennessee	Virginia
2009	8,056	905	–	2,075	1,671	982	919	1,504
2010	8,401	892	694	1,943	1,614	960	875	1,423
2011	8,405	858	723	2,006	1,586	916	908	1,408
2012	8,219	810	696	1,905	1,578	909	890	1,431
2013	8,215	821	727	1,921	1,567	919	857	1,403
2014	6,728	980	860	1,845	1,108	904	1,031	–
Total	48,024	5,266	3,700	11,695	9,124	5,590	5,480	7,169

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.

Note: The final sample of SPM units excludes observations missing a PIK, imputed SNAP, and linkages with mismatched states. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Appendix Table 3A. Underreporting of SNAP Benefit Amounts in the CPS ASEC, Pooled Sample 2009-2014

	CPS ASEC	Admin Records	Difference [CPS – Admin]
Average monthly SNAP benefit	$282	$355	-$74
	(4.35)	(4.58)	(4.02)

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW and excluding imputed SNAP. The unit of analysis is the CPS household. Average SNAP benefit values are conditional on positive SNAP benefits in both data sources. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Appendix Table 3B. Underreporting of SNAP Benefit Amounts in TRIM3, Pooled Sample 2009-2014

	TRIM3	Admin Records	Difference [TRIM3 – Admin]
Average monthly SNAP benefit	$322	$363	-$40
	(4.11)	(4.36)	(2.80)

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.
Note: Adjusted using IPW and excluding imputed SNAP. The unit of analysis is the CPS household. Average SNAP benefit values are conditional on positive SNAP benefits in both data sources. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf.

Appendix Table 4. Characteristics of Misreporting, Regression Results: Pooled Sample 2009-2014

	Underreported SNAP Monthly Amount in the CPS ASEC	Underestimated SNAP Monthly Amount in TRIM3
Log of total income	41.21***	25.24***
	(6.71)	(4.45)
Log of total income squared	-4.60***	-3.22***
	(0.62)	(0.45)
Number of kids in unit	-21.65***	-7.58*
	(4.67)	(3.08)
Native born unit head	(omitted)	
Foreign born unit head	-35.11*	-53.61***
	(14.77)	(11.32)
Unit head with less than H.S. diploma	(omitted)	
Unit head with H.S. diploma or GED	-24.31**	-2.76
	(9.29)	(7.03)
Unit head with some college	10.17	4.19
	(10.82)	(6.71)
Unit head with bachelor's degree	-4.29	-3.38
	(15.11)	(12.97)
Unit head is under 25 years old	8.57	13.71
	(12.88)	(9.01)
Owner with mortgage	(omitted)	
Owner with no mortgage	26.33	-36.58***
	(14.48)	(9.99)
Renter	48.83***	-6.70
	(12.77)	(8.16)
Inside principal cities	(omitted)	
Outside principal cities (within MSA)	7.12	0.75
	(8.93)	(6.33)
Outside MSA	3.72	13.76*
	(7.94)	(6.89)
Unit head with private insurance	(omitted)	
Unit head with public, no private insurance	33.40**	-9.95
	(11.65)	(8.07)
Unit head without insurance	0.99	-24.00**
	(13.53)	(8.87)

Appendix Table 4. Characteristics of Misreporting, Regression Results: Pooled Sample 2009-2014 (con't.)

	Underreported SNAP Monthly Amount in the CPS ASEC	Underestimated SNAP Monthly Amount in TRIM3
Unit head worked full-time, year-round	(omitted)	
Unit head worked less than full-time, year round	-26.26	27.17**
	(14.73)	(9.35)
Unit head did not work	-50.08**	15.87
	(15.91)	(10.07)
Unit head is not working age	-31.11	14.11
	(17.56)	(10.94)
Unit head does not have a disability	(omitted)	
Unit head has a disability	3.26	-22.47**
	(9.22)	(6.88)
Number of SPM units	4281	5057

Source: U.S. Census Bureau, Current Population Survey, 2010–2015 Annual Social and Economic Supplements, Transfer Income Model version 3 (TRIM3), and state SNAP administrative records. The administrative records for Arizona, Illinois, Maryland, Oregon, and Tennessee cover calendar years 2009–2014. The administrative records for Idaho cover calendar years 2010–2014 and for Virginia cover calendar years 2009–2013.

*Notes: * p<0.10, ** p<0.05, *** p<0.01. State- and year-level fixed effects included. We also control for the type of SPM unit and race/ethnicity of the SPM unit head. Adjusted using IPW, excluding imputed SNAP values, and standard errors are clustered by PIK. The unit of analysis is the SPM unit. The omitted category indicates the benchmark group against which comparisons can be made. Probability of reporting is a linear probability model estimating the probability of a benefit amount of zero in TRIM3 conditional on positive values in administrative records. Predicted difference in reporting is an ordinary least squares model predicting the difference between monthly administrative and TRIM3 reported SNAP values (TRIM3 – admin records) conditional on positive values in both TRIM3 and administrative records. For information on confidentiality protection, sampling error, non-sampling error, and definitions, see https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf*