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Improving the Assessment of SNAP Targeting Using Administrative Records

Erik Scherpf, Constance Newman, and Mark Prell

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Abstract

USDA's Supplemental Nutrition Assistance Program (SNAP) provides food and nutrition benefits to low-income households based on a formula that adjusts the benefit amount a household receives based on monthly need. This study assesses the extent to which SNAP reaches the poorest households, also known as benefit targeting, by estimating benefit receipt by annual household income relative to poverty. To conduct this analysis, ERS linked 2008-12 SNAP administrative records from New York State to data from the U.S. Census Bureau's American Community Survey (ACS), a primary source for national, State, and local information on the use of SNAP and other public assistance programs. The linked data provide better information on SNAP receipt than that which would be estimated by the ACS alone and permit a more complete characterization of SNAP targeting. Study findings show that the assessment of SNAP targeting varies by the three measures of benefit receipt examined. Estimates of SNAP targeting toward low-income households improve when using either of two measures of intensity of SNAP participation relative to measures of ever-in-the-year participation. Replacing survey-based data on SNAP benefit receipt with administrative records of SNAP benefit receipt and adjusting the survey households to more closely reflect administrative SNAP units also improves estimates of targeting to low-income participants. Finally, estimated program targeting is improved by removing sample households that do not report income and for which income is imputed in the survey from the analysis.

Keywords: SNAP, Supplemental Nutrition Assistance Program, American Community Survey, New York, SNAP participation, administrative records, SNAP households, food and nutrition assistance programs, benefits targeting, poverty, income imputation

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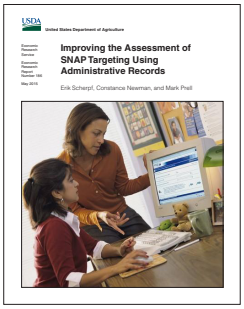

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Improving the Assessment of SNAP Targeting Using Administrative Records

Erik Scherpf, Constance Newman, and Mark Prell

What Is the Issue?

Household survey data are a critical resource for studying USDA's Supplemental Nutrition Assistance Program (SNAP). The data are frequently used to assess the performance of "benefits targeting," or how well SNAP benefits reach the poorest households. However, household survey data have some shortcomings, which, if not taken into account, can lead to a distorted picture of who is receiving SNAP benefits. This study addresses some of these measurement issues by combining data from the American Community Survey (ACS)—the largest nationally representative household survey in the United States—with SNAP administrative records from New York State. The linked data expand the information on SNAP receipt available in the ACS alone, namely, whether households receive SNAP benefits at any time during the year, to include the *amount* of benefits received in a year and the *number of months* of receipt in a year. The administrative records also help address the well-documented problem of under-reporting of SNAP receipt in the ACS.

What Did the Study Find?

In general, the study finds improved estimates of SNAP targeting over previous measures due to:

- Substituting American Community Survey (ACS) data on SNAP receipt with data from administrative records on SNAP receipt.
- Defining the household according to SNAP administrative guidelines (referred to as "constructed SNAP units").
- Restricting analysis to those households that responded to all income questions in the survey.

Household participation in a given year. Among all constructed SNAP units that received SNAP at any point during the average year between 2008 and 2012, 27 percent were in "deep poverty," with annual incomes at or below 50 percent of the Federal poverty threshold. Units with annual incomes at 51-100 percent of poverty accounted for another 33 percent of SNAP units—the largest share among all income categories. About 15 percent of all SNAP units had annual incomes above 200 percent of poverty. Despite their high annual incomes, these units, or certain members of these units, may have received benefits for 1 or more months of the year because SNAP eligibility is based on monthly, not annual, income.

Intensity of SNAP use. Although they accounted for 27 percent of all units participating at any point in the year, SNAP units in deep poverty received about 32 percent of total annual SNAP benefits. As expected, SNAP units in the highest annual income category (15 percent of all participants) received disproportionately fewer annual benefits (13 percent of total). In general, households with higher annual incomes did not receive as high a level of benefits, or receive them for as long, as households with lower annual incomes. Distinguishing among different intensities of benefit receipt highlights the role of SNAP in providing temporary assistance to working households whose volatile incomes may make them program eligible for only part of the year.

An estimated 67 percent of constructed SNAP units that received SNAP benefits for the *entire* year reported annual incomes at or below 100 percent of poverty. SNAP units with annual incomes above 200 percent of poverty accounted for 26 percent of those receiving SNAP benefits for 6 months or less.

Omitting constructed SNAP units that did not respond to all income questions in the survey results in estimates that suggest SNAP is more highly targeted toward those with annual incomes at or below poverty. Findings also show that constructed SNAP units with annual incomes above 130 percent of poverty are significantly more likely to have an elderly member, a disabled member, receipt of earnings from work, or imputed income.

How Was the Study Conducted?

The study linked the universe of SNAP administrative records from New York State to 5 years of data (2008-12) from the U.S. Census Bureau's American Community Survey. The advantage of linking these data sources is that SNAP administrative records provide a more accurate measure of SNAP receipt than that reported in the ACS, while the ACS contains information on annual income and household demographics that the linked administrative records lack, including information on eligible nonparticipants. In addition, the format of the administrative records enables one to measure the number of months and the value of benefit receipt, two items not reported in the ACS.

The study uses ACS demographic information to better account for SNAP program subunits, or constructed SNAP units, within surveyed households—the household units that qualify as a SNAP unit under USDA rules. The analysis demonstrates how the inclusion of survey imputed income affects the results, and it examines the characteristics of SNAP participants with higher incomes, using both descriptive and multivariate analysis.

Improving the Assessment of SNAP Targeting Using Administrative Records

Introduction

Two closely related objectives of USDA's Supplemental Nutrition Assistance Program (SNAP) are to make program benefits available to households in need of food and nutrition assistance and to make those benefits available in proportion to that need. To this end, SNAP regulations establish eligibility guidelines and a benefit determination formula that target program benefits to households based largely on household income.[1] With certain exceptions, households qualify for SNAP benefits if their *monthly* gross income does not exceed 130 percent of the poverty level and their net income (i.e., income exclusive of certain deductible expenses) does not exceed 100 percent of poverty.[2] The benefit level is then determined as a function of household size and net income such that, for a given household size, the lower the income, the higher the benefit.

Rising SNAP caseloads during, and following, the Great Recession brought renewed focus to caseload composition and, more specifically, the share of higher income households receiving benefits. Armor and Sousa (2012), for instance, used data from the American Community Survey (ACS) to show that the share of SNAP-recipient households with *annual* income above the poverty level had risen and, as of 2010, accounted for nearly half of all SNAP households. Findings such as these raised concerns among policymakers and the public that SNAP benefits are not well targeted to those most in need of food and nutrition assistance.

This study assesses the targeting of SNAP benefits by household poverty level based on annual income, supplementing (and updating) the ACS data used by Armor and Sousa with linked SNAP administrative benefit records.[3] We consider three measures of SNAP receipt: whether a household received any benefits over the course of a year (corresponding to the ACS measure of SNAP receipt), total annual benefits received, and the number of months in the year the household received benefits. These measures of SNAP receipt from administrative records reveal an improved picture of SNAP targeting to lower income households relative to one that relies on ACS annual income data alone.

The first measure provides the broadest view of SNAP benefit receipt, capturing all households that participate in the program at any time during the year, regardless of how brief the spell of receipt or how small the benefit received. The latter two measures refine the picture of SNAP targeting by indicating how intensively households used the program during a given year. These intensive measures shed light on targeting of need over time and on factors behind receipt of benefits by households that

[1]Income has become a more salient determinant of eligibility as many States have adopted policies referred to as broad-based categorical eligibility (BBCE), under which the asset test is either relaxed or waived. Special provisions also apply to certain demographic groups, considered especially vulnerable to food insecurity, that exempt them from some aspects of the income test.

[2]Households with elderly and disabled members are not subject to the gross income test and are allowed higher deductions. State BBCE policies may also raise the gross income limit for applicants meeting certain criteria.

[3]SNAP administrative records contain extensive information on income as well as other information used to calculate program eligibility. However, the SNAP administrative records that we use contain no income measures and only limited demographic information. The New York SNAP linked data contain enough demographic information to facilitate the link, information on SNAP unit composition, and monthly SNAP unit benefits. All income and detailed characteristics in this report are drawn from the ACS.

have annual incomes in excess of the SNAP gross income limit. Findings reveal, for instance, that recipient households with higher annual incomes do not receive as high a level of benefits, or receive them for as long, as households with lower annual incomes. Distinguishing among different intensities of receipt thus highlights the role of SNAP in providing temporary assistance to working households whose volatile incomes may make them program eligible for part of the year even though their *annual* gross income exceeds the program's monthly eligibility threshold.

Targeting in public assistance programs typically implies a concern with the degree to which benefits are directed to poor households. Income, in this case, serves as a convenient proxy for a household's ability to provide for its food needs. This study estimates distributions of each SNAP receipt measure by five categories of annual income relative to poverty: at or below 50 percent of poverty (or deep poverty), between 51 and 100 percent of poverty, between 101 and 130 percent of poverty, between 131 and 200 percent of poverty, and over 200 percent of poverty.

One reason for taking a broader view of targeting, and not focusing on households on either side of the poverty line, is that SNAP eligibility rules make benefits available not just to households with monthly income below poverty but also to households with gross monthly income up to 130 percent of poverty or, if elderly and disabled members are present, to households with income over 130 percent of poverty.

Another reason relates to the timeframe over which we measure income and program receipt. This study evaluates targeting on an annual basis, measuring income and program receipt over a 12-month period. This approach is consistent with the timeframe used in official measures of poverty. SNAP eligibility, however, is assessed on a monthly basis, consistent with program operations. Focusing only on households that would have qualified for SNAP based on their *annual* income would therefore miss those households that may have only qualified for part of the year.

The data used in this study to assess SNAP targeting combine household survey data with SNAP administrative records of SNAP units' monthly benefit receipt. Specifically, we link the universe of SNAP administrative records from New York State to 5 years of data (2008 to 2012) from the ACS, which is conducted by the U.S. Census Bureau. SNAP administrative records provide a more accurate measure of SNAP receipt than that reported in the ACS, while the ACS data contain information on household annual income and demographic characteristics that the linked administrative records lack. The ACS also provides the sample size necessary to perform this analysis at the State level. In addition to providing a more accurate measure of program receipt, the longitudinal content of the linked administrative records enables one to measure the number of months and the annual dollar value of benefit receipt, two items not reported in the ACS.

The sensitivity of the study's results is tested against different definitions of the household and to the presence of observations with survey imputed income. Defining the household requires some care since the household concept used to administer SNAP differs from that used in the ACS. How the household is defined will affect the determination of its annual income and poverty level and, therefore, an assessment of SNAP targeting. We address these distinct household concepts by using the information available in the ACS to construct households, or units, that more closely reflect the definition used for administering SNAP. This approach distinguishes these "constructed SNAP units" from address-based ACS households and from "administrative SNAP units" identified in the official SNAP records. The implications of these different household definitions are demonstrated later in the report.

Nonresponse to income questions in the ACS, and the imputation methods used to address item nonresponse, may also affect estimates of the effectiveness of SNAP targeting. Nearly a third of the ACS survey-weighted count of households participating in SNAP in New York State did not respond to the entire battery of ACS income questions and therefore have at least some portion of their income imputed. The Census Bureau's imputation procedures seek to preserve the overall mean and variance of reported income for the total population but do not take into account households' SNAP receipt status. As a result, the income distribution of SNAP households with some imputed income may differ from the income distribution of SNAP households with none. Such a discrepancy will affect estimates of SNAP targeting.

This study's treatment of these measurement issues shows a substantially altered picture of SNAP targeting than that offered by a direct application. This study may also serve as a useful guide for researchers interested in using the ACS to analyze SNAP. Despite some shortcomings, the ACS remains the only data source for analyzing SNAP at the sub-State level and for certain demographic groups at the State level. Finally, this study shows the richer and more accurate analysis made possible by linking SNAP administrative benefit records to the ACS (and potentially other Census household surveys). It also points to the potential benefits of scaling such a linkage up to the national level.

SNAP Targeting: Issues and Approach

Specifying the Unit of Analysis

A first step in analyzing SNAP targeting involves specifying the unit of analysis. In this study, the household, rather than the individual, is the unit of analysis. However, the household concept used for SNAP administration differs from that used in the ACS. In the ACS, the household is an address-based concept, according to which all individuals who live at a given address at the time of the survey interview form a household. For the purpose of program administration, SNAP regulations establish more specific criteria for what constitutes a SNAP household. As a result, the SNAP household does not necessarily coincide with the address-based definition of the household employed in the ACS: not all members of the ACS household necessarily belong to the SNAP household, and multiple SNAP households can reside in a single ACS household. As mentioned earlier, this study refers to this program-based household concept as the administrative SNAP unit.[4] Constructed SNAP units refer to SNAP units estimated from the ACS data.

Employing the ACS household definition for this analysis will yield both too few SNAP households and households that are too large—in terms of the number of members— relative to the number of administrative SNAP units.[5] The household definition is of consequence because it affects two components used to assess targeting: the household's income and its poverty threshold, both of which are functions of household size. When there are income-earning members of the ACS household who do not belong to the SNAP unit, employing the ACS household definition will overstate the SNAP household size and income relative to that of the administrative SNAP unit, understating the effectiveness of SNAP targeting to low-income households.

In this study, we address the discrepancy between the definition of the ACS household and that of the SNAP unit by applying, to the extent possible, the SNAP regulations for SNAP household formation to identify SNAP units in the ACS, following the methodology in Newman and Scherpf (2013). As shown in the following section, this procedure of constructing SNAP units yields a distribution of household size that more closely matches that found in administrative data, particularly the large proportion of single-person SNAP households found in administrative data.

Definition of the Administrative SNAP Unit

SNAP regulations define a SNAP unit as a group of individuals who live together and customarily purchase food and prepare meals together. In addition to providing this definition, SNAP regulations establish a number of other guidelines for SNAP unit formation that pertain to the age and relationship of household members. These include the requirement that individuals under age 22 who live in a household with a parent present must remain in the SNAP unit of that parent. If a parent is not present, a child under age 18 must be included in the SNAP unit of a guardian or parent-like figure in the household. Individuals in such households who are between ages 18 and 22 may form their own SNAP units. Spouses living in the same household also cannot form separate SNAP units.

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[4]These administrative SNAP units are identified in the administrative records by a unique case identifier in a given month.

[5]If, on the other hand, one examines SNAP participation among individuals, then the ACS may actually produce a large number of false positive reports of SNAP participation among individuals in the survey, offsetting to some extent the net under-reporting of SNAP participation at the household level.

The ACS does not provide sufficient information to determine whether individuals who live in the same household purchase food and prepare meals together, so this guideline cannot be applied when attempting to identify SNAP units in the ACS. Instead, we apply to the extent possible the guidelines that pertain to the age and relationship of ACS household members. Because the ACS does not identify all interrelationships among household members, this study uses the available information to infer some of these relationships to construct SNAP units.

A few aspects of SNAP unit construction should be noted. First, in an effort to better match the distribution of SNAP unit size in administrative data, we allow adults to form the smallest units permitted under the SNAP regulations that can be applied using information in the ACS. As a consequence, single adult children (age 22 and older) without dependents can form their own SNAP units. Similarly, we do not necessarily assign adult siblings who live in the same household to the same SNAP unit since the SNAP guidelines on age and relationships do not explicitly prevent adult siblings living in the same household from forming separate SNAP units. In addition to keeping spouses together in a SNAP unit, we also assign individuals identified in the ACS as partners to the same SNAP unit.[6]

SNAP Policies That Affect Targeting

SNAP eligibility guidelines also contain special provisions for units with elderly or disabled members that can affect estimates of SNAP targeting. Units with elderly or disabled members are not subject to the gross income test. And, although they are still subject to the net income test, these units may qualify for a medical deduction not available to other households and are exempted from the cap on the excess shelter expense deduction that is applied to determine net income. Units with elderly and disabled members should therefore be more likely to qualify for benefits with monthly income above the gross income limit and to qualify for a higher benefit level relative to other units with the same level of gross income. And because these units can qualify for SNAP with monthly income above 130 percent of poverty, one could also expect to observe units with elderly or disabled members receiving SNAP with annual income in excess of 130 percent of poverty.

One last provision that may bear on SNAP targeting relates to the earned income deduction that is applied in determining net income. Under this provision, SNAP units are able to deduct 20 percent of earned income from gross income in the net income calculation. Thus, for a given level of income and the same level of other deductible expenses, units with earners will qualify for a larger benefit than units without earners. Units with earners are also more likely to pass the net income test and, hence, qualify for some benefit.

[6]In practice, this only applies to partners of the ACS householder, since partners of other ACS household members are not explicitly identified and we do not attempt to infer unmarried partner relationships.

Broad-Based Categorical Eligibility

Another SNAP policy that is relevant for program targeting is known as broad-based categorical eligibility (BBCE).[7] Under this policy, States can opt to set a gross income limit higher than the SNAP Federal limit and waive, or relax, the SNAP Federal asset test. Under the Federal asset test, the value of a household's countable assets cannot exceed $2,000; for households that contain an elderly or disabled member, the limit is $3,000. Even if a unit meets the State's higher gross income test, however, it must still qualify for a minimum benefit based on its net income, except for one- or two-person units that will at least qualify for the minimum positive benefit if they qualify under a State's BBCE policy. New York adopted a broad-based categorical eligibility policy in 2008 under which units with gross incomes up to 200 percent of (monthly) poverty could qualify for SNAP if they have dependent care expenses. For this analysis, BBCE means that units that are likely to incur dependent care expenses, such as those with elderly members and/or young children, will be able to qualify for SNAP benefits even with monthly gross income above the SNAP eligibility limit of 130 percent of poverty. One should therefore also expect to see units with these demographic characteristics among the units with annual income above 130 percent of poverty that receive SNAP benefits.

[7]Broad-based categorical eligibility (BBCE) comes from a program created by a State that provides a noncash TANF (Temporary Assistance for Needy Families)-funded or State maintenance-of-effort-funded benefit using State-established eligibility criteria for the noncash benefit. Households that qualify and receive the noncash benefit are determined to be categorically eligible for SNAP in the same way that receiving a TANF cash benefit confers categorical eligibility for SNAP. SNAP uses household income to determine the SNAP allotment, not SNAP eligibility. SNAP eligibility comes from receipt of the noncash TANF benefit.

Prior Research on SNAP Targeting

USDA's Food and Nutrition Service (FNS) publishes an annual report on the characteristics of SNAP households (for the latest report, see USDA (2014)). The FNS reports analyze a research sample based on SNAP quality control (QC) data, drawn from States' administrative records. Each month during the fiscal year, a new random sample of SNAP units is reviewed to see if their composition, monthly income, and monthly expenses were correctly used by the State to determine the unit's SNAP eligibility and monthly benefit. The FNS research data are a cross-section intended to represent the population of SNAP households that receive SNAP benefits in the fiscal year. The FNS reports address issues of SNAP targeting among households that receive SNAP in an average month of the fiscal year by providing the distribution of SNAP households (or more precisely, official SNAP units) by monthly income relative to a monthly poverty measure.

A complementary analysis on SNAP targeting, and the focus of this report, is examination of SNAP households that receive SNAP benefits at some time during the year (for 1 or more months). Statistically, the population of households participating in SNAP in an *average month* of the year—the focus of FNS reports—is not the same as the population that participates *at some time* during the year. Households with relatively brief spells of SNAP receipt are less likely than households with longer spells to be included in a "snapshot," or sample, of participants in an average month. Compared with a long spell, a brief spell has a higher probability of ending before (or starting after) the time the average-month "snapshot" is taken. In contrast, each SNAP household participating during the year—whether its spell was brief or long—has an equal probability of being captured in the 12-month, or ever-in-the-year, sample.[8] In samples representing 12-month time periods, households with briefer spells (i.e., those more likely to participate at some time during the year) tend to have more volatile monthly income, which may explain why some participate in SNAP for part of year, even though on an *annual* basis their household income exceeds 130 percent of poverty. Thus, both annual survey data and monthly data, such as the FNS research sample, can be useful for analysis because they capture two statistically distinct sets of SNAP households.

Another measurement issue that accounts for differences in results between this ERS study and the FNS reports is that household composition reported at the time of the ACS interview date may not reflect the composition of the household, much less the SNAP unit, at the time of SNAP receipt. Recall that although this study constructs from ACS households' closer approximations of administrative SNAP units, the accuracy of the procedure still relies on household composition reported in the ACS at the time of the survey interview, which does not necessarily reflect household composition at the time members of the household last received SNAP. Hence, this measurement approach will not necessarily yield the correct SNAP unit if household composition in the ACS differs from that earlier in the year. If household members who are incorrectly assigned to the SNAP unit had any income during the year, the annual income of the constructed SNAP units would be overstated relative to the actual administrative SNAP unit at the time of benefit receipt.

[8]More concretely, our data on ever-in-the-year SNAP participants are drawn from a flow sample (plus a stock sample of those participating in the first month of the year), while the FNS research data are drawn from a series of monthly stock samples. These sampling schemes are based on different concepts of the relevant population and, as Lancaster (1990) and Salant (1977) have shown, these populations will likely differ in important ways, including in terms of average SNAP spell length.

In a study similar to this one, Amour and Sousa (2012) use ACS data to examine the incidence of SNAP receipt by poverty level. One key difference in the studies' approaches, however, is that Amour and Sousa use the measure of SNAP receipt available in the ACS, so that their focus is solely on ever-in-the-year SNAP participation reported by the survey household. Another key difference is that Amour and Sousa use the ACS household as their unit of analysis and do not attempt to approximate the administrative SNAP unit, as is done in this study. Since SNAP units on average tend to be smaller than ACS households, this means that Amour and Sousa will in some instances be counting ACS household members as SNAP recipients when in fact they are not.[9] As previously discussed, if there are ACS household members who do not belong to the SNAP unit or who belong to a different SNAP unit, aggregating income at the ACS household level can lead to income being overstated relative to income measured at the SNAP unit level. Armor and Sousa also do not consider the impact of income imputation in the ACS on their analysis.

Ben-Shalom et al. (2012) provide an overview of the effectiveness of a range of public assistance programs, including SNAP. Their study uses monthly survey data from the Survey of Income and Program Participation (SIPP) conducted by the U.S. Census Bureau. A key finding from their study is that, from 1984 to 2004, the share of public benefits going to households in deep poverty declined over time and by the end of the period was smaller than the share of benefits going to households with incomes between 50 and 100 percent of poverty. Findings from this ERS study also show that households in this income category (50 to 100 percent of poverty) make up a larger share of households that participate in SNAP at any time during the year and that participate for the entire year than households in deep poverty. Shaefer and Edin (2013), on the other hand, use SIPP data to show that the prevalence of households in extreme poverty—those living on $2 or less a day, per person—has climbed sharply since 1996; they show, moreover, that SNAP played a significant role in lifting those households out of extreme poverty.

Doyle and Dalrymple (1987) examined issues similar to those in this study for the 1984 panel of SIPP. Specifically, they estimated the distribution of SNAP households by income class and poverty level, examining the impact of income imputation and differences in the definition of the SIPP household and the administrative SNAP unit. Indeed, Doyle and Dalrymple (1987) were among the first to point to the effect of income imputation in household surveys on the measurement of income for low-income populations and the SNAP (or food stamp) population in particular. Similar to findings from this ERS study, Doyle and Dalrymple found that substituting the SIPP household definition with their own constructed SNAP units resulted in a larger proportion of low-income SNAP units. By excluding observations with imputed income, as is done in this study, Doyle and Dalrymple shifted the distribution of SNAP in the same direction, resulting in a smaller proportion of units with incomes above the program eligibility limit. This effect was less pronounced than the effect observed in this study, due in part to the smaller share of SNAP units with imputed income in the 1984 SIPP.

[9]Although our approach in this study is to adhere to program rules in defining the SNAP household, or unit, one could argue that the welfare of individuals is best evaluated by considering the broader ACS (i.e., address-based) household. This latter view assumes some degree of resource sharing among ACS household members who would not belong to the same SNAP unit.

Data and Sample Description

The sample used for this study was created using the 2008 through 2012 ACS matched to SNAP administrative records from New York State.[10] Since the reference period of the 2008 ACS covers portions of calendar year 2007, the administrative records that we link to the five ACS surveys span calendar years 2007 to 2012. The SNAP administrative records matched to the ACS contain one record for each month a person received SNAP benefits and include information on the value of the benefit received by the SNAP unit, a case unit number to identify administrative SNAP units, a client number, and some limited demographic information for each SNAP unit member. The longitudinal format of the administrative records enables one to determine for each month between 2007 and 2012 whether an individual received SNAP, as well as the benefit amount received by the individual's administrative SNAP unit.[11]

Measuring SNAP Targeting Using the ACS and SNAP Administrative Records

With over 3 million addresses sampled each year, the ACS is the largest annual household survey in the United States. Its timeliness and large sample size make it a vital data source for informing policy and budgetary decisions at the Federal, State, and local levels. It is the only national household survey that allows estimation at sub-State levels of geography. For assessing SNAP targeting, however, the ACS, as with all household surveys, presents some conceptual and measurement difficulties.

By linking the ACS to SNAP administrative records from New York State, this study leverages the benefits and minimizes the shortcomings of each data source.[12] As discussed earlier, one of the most important advantages of linking the SNAP administrative records is that it enables one to characterize more fully SNAP receipt, supplementing the ACS measure of whether a household participated at any time during the year with the number of months of receipt and the value of benefits received during the year. The administrative records also provide a more accurate measure of program receipt than do household surveys. Respondents in household surveys, including the ACS, tend to substantially under-report SNAP receipt (Meyer et al., 2009, Meyer and Goerge, 2011) The Census Bureau requested the minimum demographic data necessary from New York SNAP administrative data to enable matching SNAP benefit histories to the ACS records. The ACS, in turn, augments the administrative records by providing richer demographic information on those

[10]To be precise, we combine 5 years of the single-year ACS files, rather than the ACS 5-year file.

[11]Hurricane Sandy occurred toward the end of this time period (October 2012), in response to which D-SNAP, or disaster SNAP, was issued in parts of New York. For instance, in New York City, 83 ZIP Codes were eligible for D-SNAP in November, but only 10 (and 2 partial) ZIP Codes were eligible in December. D-SNAP issuance, however, is not separately identified in our data. Because D-SNAP only affected a portion of the State, for at most 2 months in our observation window, and because we do not observe appreciable differences in the results for 2012, when the analysis is broken out by year, we do not make any adjustments to our data.

[12]This data linkage is part of a broader effort of the U.S. Census Bureau, FNS, and ERS to combine State SNAP administrative records and Census household surveys to improve survey data quality and survey frame development. Census and FNS established the legal authority and the means for Census to contact States and acquire SNAP administrative records. The purpose of the agreement between Census and FNS is to improve Census surveys and provide information to facilitate administration of SNAP. Linking administrative records and household survey data enables more detailed and accurate analysis of issues related to SNAP use at the State, and sub-State, level that may also be useful for program administration and evaluation (see, for example, Newman and Scherpf (2013)). Although currently limited to only a few States, the goal is to expand the geographic scope of this project to facilitate cross-State analysis.

SNAP participants who are in the ACS New York State sample. One limitation of the data used in this study is that, with administrative records available from only one State, findings may not be representative of other States.

Merging the Two Data Sources and Measuring SNAP Receipt

We merge the individual records from the two data sources using a Protected Identification Key (PIK), a unique identifier assigned to each individual by Census. Assigning PIKs to records in both the ACS and the SNAP administrative records facilitates the linking of the two data sources; the PIKs also serve as the unique longitudinal identifier for individuals in the sample. The proportion of SNAP administrative records that receive a valid PIK (i.e., the PIK rate) is higher than that of the ACS, largely because the SNAP records contain validated Social Security numbers (SSNs), which are then redacted, along with other personally identifying information, once PIKs are assigned.[13] PIK rates tend to be somewhat lower in the ACS, which does not collect the SSNs of respondents, although these rates are still above 90 percent for the survey years used in this study.

We conduct our analysis at the SNAP unit level, counting as SNAP-participating units those in which any member matches to the administrative records during the household's ACS reference period. The base sample comprises all constructed SNAP units in the 2008 through 2012 ACS surveys.

Measuring Poverty

In determining poverty status, the ACS uses thresholds based on family (not household) size and the presence of children in the household.[14] For unrelated individuals and two-person families, a further distinction is made between those with and without an elderly reference person (age 65 or older). SNAP income-eligibility limits are based on the poverty guidelines established by the U.S. Department of Health and Human Services but do not distinguish between households (or, more accurately, units) with elderly members or children. The cutoffs are 130 percent of poverty for the monthly gross income test and 100 percent of poverty for the monthly net income test.

Since interviews in the ACS are conducted throughout the year, for most respondents, the reference period over which income is measured spans more than 1 calendar year, the time period over which official poverty measures are defined. The Census Bureau addresses this issue by adjusting the base-year poverty thresholds (for the year 1982) by monthly inflation factors for each of the 12 months in the reference period. The SNAP poverty guidelines are fixed for each of the Federal fiscal years. To apply the poverty guidelines used by USDA to determine income eligibility, we take the weighted average of the fiscal year poverty guidelines spanned by a SNAP unit's reference period, where the weights are determined by the distribution of the 12 months of the ACS reference period across the 2 fiscal years.

In this study, poverty is calculated two different ways. First, we apply the USDA/FNS poverty measure to the ACS household, not excluding any unrelated household members. We then calculate poverty status based on our constructed SNAP units, rather than the ACS household; that is, we determine both income and the relevant poverty guideline for the constructed SNAP unit rather than the ACS household.

[13]PIK rates for the administrative records used in this study were 99 percent or higher in each year.

[14]The Census Bureau excludes from the family concept any unrelated individuals living in the ACS household.

Gross income is measured using the person-level income variable in the ACS, summed across members of the relevant household concept (e.g., the constructed SNAP unit). Included in the ACS income variable is wage or salary income; farm or nonfarm self-employment income (net of expenses); interest, dividends, net rental, royalty income or income from estates and trusts; Social Security Income (which includes Social Security pensions and survivor benefits, permanent disability insurance payments, and railroad retirement insurance, but excluding Medicare reimbursements); Supplemental Security Income (SSI); public assistance income (which includes general assistance and TANF, but excludes SSI payments and the cash value of SNAP benefits); retirement, survivor or disability income; and all other income (including, but not limited to, unemployment compensation, worker's compensation, Veterans Affairs payments, alimony and child support, military family allotments, and contributions received from people outside of the household).[15]

[15]Total household income measured in the ACS is similar to the definition of gross income used to determine SNAP eligibility. However, the latter excludes net earnings of students under age 18 and includes net earnings of the self-employed rather than the income they draw from their business (Doyle and Dalrymple, 1987).

Empirical Approach

The empirical analysis has three objectives. The first is to assess SNAP targeting to different segments of the income distribution. To do this, we estimate three distributions, each by the SNAP unit's poverty level using our 12-month rolling average: (1) the distribution of the weighted annual count of constructed SNAP units; (2) the distribution of total annual SNAP benefits; and (3) the distribution of the number of months of SNAP receipt in the year.[16] We estimate these distributions by five annual income-relative-to-poverty categories: at or below 50 percent of poverty (or deep poverty), between 51 and 100 percent of poverty, between 101 and 130 percent of poverty (the upper bound is the monthly SNAP gross income limit), between 131 and 200 percent of poverty (the income range in which some households could qualify under New York State's BBCE policy), and over 200 percent of poverty.

Second, we explore the impact of three measurement issues on the analysis: the definition of the "household" unit of analysis, reporting error in the survey-based measure of SNAP receipt, and the imputation of income. For the distribution of SNAP unit/household counts, we first evaluate the impact of substituting constructed SNAP units for ACS households and then of substituting administratively recorded SNAP receipt for survey-reported receipt. We perform these comparisons only for the distribution of SNAP unit/household counts because it is the only measure of receipt that can be derived in the administrative records and the ACS. The impact of income imputation in the ACS is examined by re-estimating each of the three distributions of SNAP receipt noted above but restricting the universe to those households that reported all of their income.

Finally, we conclude by examining the characteristics of SNAP units with high annual income relative to poverty. We look first at the proportion of units with annual income above the SNAP gross income limit accounted for by those containing members belonging to demographic groups that under SNAP rules can qualify for benefits with monthly income above 130 percent of poverty. These include units with elderly or disabled members that are exempt from the program's gross income test and that can take a medical-expense deduction, only available to units with elderly and disabled persons, and a larger, uncapped excess-shelter-expense deduction (and are more likely to qualify for those deductions). Since our sample is drawn from New York, we also consider units with very young children (age 4 or younger) because these units are most likely, along with units with elderly members, to have dependent-care deductions that would allow them to qualify for benefits under the State's BBCE policy.

We also consider units with members who work, for two reasons. First, units with earners qualify for the earned income deduction, and although this is not reflected in the gross income measure we use in this analysis, it does mean that for a given qualifying level of gross income and deduction expenses, these units will be more likely to pass the net income test and to qualify for a higher benefit level. Second, units with earners are more likely to have volatile income during the year that would account for a unit receiving some SNAP benefits despite annual income above the SNAP gross income limit.

We examine a broader array of factors associated with SNAP receipt by higher annual income units in a multivariate logistic framework. Our model considers the aforementioned factors, including a more detailed breakdown of the work effort of the household member, and enables us to isolate the independent association of each factor, holding the other factors constant.

[16]Recall that although we refer to each of the three receipt measures as "annual," we are in each case actually measuring receipt over the 12-month rolling reference period for each respondent household in the ACS.

Results

Measurement of the SNAP Unit and SNAP Receipt in the ACS

Table 1 compares ACS SNAP-reported households and constructed SNAP units with administrative SNAP units identified in the New York SNAP records.[17] One important difference between the estimates that use the ACS (either linked or unlinked) and those that rely solely on the (unlinked) administrative records is that the ACS sample excludes respondents residing in group quarters that are included, but not identifiable, in the administrative data. It is possible that many SNAP recipients residing in group quarters will form their own one-person units.[18] Consequently, the constructed SNAP units derived from ACS data will understate the proportion of one-person units. And because we cannot identify group quarters participants in the administrative records, we cannot adjust the administrative records to facilitate comparison.

The first column in table 1 displays the distribution of the ACS SNAP-reported household size. The two middle columns show the distribution of constructed SNAP unit size, the first of which uses SNAP receipt reported in the ACS and the second SNAP receipt recorded in the administrative records. The fourth column shows the distribution of administrative SNAP unit size in the unlinked administrative records.

As revealed in the table, the proportion of one-person ACS SNAP-reported households is smaller than the proportion of one-person administrative SNAP units (30.9 versus 57.6 percent). Also, the share of one-person units in our constructed SNAP units using administrative receipt is significantly greater than the share of one-person units in the ACS SNAP-reported households.

Lastly, the proportion of one-person constructed SNAP units with ACS-reported SNAP receipt is slightly larger than the proportion of one-person administrative SNAP units (58.3 versus 57.6 percent). This result is not entirely unexpected. As previously noted, because SNAP receipt is a household-level variable, the ACS tends to over-ascribe program receipt within households. In other words, SNAP receipt in this case is attributed to ACS household members who may not be part of an administrative SNAP unit. Clearly, over-ascribing of receipt is more likely to occur in larger households. When we attempt to construct SNAP units in the ACS, we are often breaking up these larger households into smaller units. When using the ACS measure of receipt, all of the constructed units formed from the larger ACS households become, by definition, SNAP units (i.e., units receiving SNAP) because they inherit the ACS household's SNAP receipt indicator. This is not the case when using the administrative records to measure SNAP receipt. Only those constructed SNAP units in which any member matches to the administrative records will be counted as a SNAP participating

[17]Since the ACS asks respondents for any participation in the past 12 months (the reference period), and since the ACS interviews are spread out across the calendar year, the combined reference periods of all ACS respondents for a given survey year span a period of roughly 2 calendar years: from January of the year prior to the survey year (e.g., January 2009 for the 2010 ACS) to November of the survey year. To derive comparable weighted counts of SNAP units in the administrative records, we took the average of the number of administrative units to ever participate in each of the 2 years covered by the reference period of each survey year.

[18]Generally, only individuals living in group quarter residences with 16 or fewer members in which meals are provided will qualify for SNAP. Individuals in larger group homes are not eligible for SNAP. Residents of federally subsidized housing for the elderly and disabled persons living in certain nonprofit group living arrangements are exempted from this rule.

Table 1

Distribution of SNAP recipient units in New York State, by unit size and unit type, 2008-12

Unit size	Alternative measures of SNAP units			Administrative SNAP units with admin. SNAP receipt
	ACS household with ACS SNAP receipt	Constructed SNAP units with ACS SNAP receipt	Constructed SNAP units with admin. SNAP receipt	
	(1)	(2)	(3)	(4)
Number of members	*Percent*[a,b]			
1	30.9	58.3	51.9	57.6
2	21.4	17.0	18.5	18.2
3	16.9	10.1	12.0	11.5
4	14.0	7.8	9.3	6.8
5	8.6	3.9	4.8	3.2
6 or more	8.2	2.9	3.5	2.7
Total	100.0	100.0	100.0	100.0
Weighted number (Total across 2008-12)	5,173,369	7,958,380	8,019,835	
Number (Total across 2008-12)				9,905,372

[a]Columns may not sum to 100.0 due to rounding.
[b]Standard errors associated with each percent estimate are all less than 0.01 percent and are available upon request.
Notes: SNAP refers to USDA's Supplemental Nutrition Assistance Program. ACS refers to American Community Survey. SNAP recipients refer to a group of people (as defined by one or another unit of analysis: the ACS household, constructed SNAP units, or administrative SNAP units) who receive SNAP benefits (as measured by one or another data source: the ACS or New York SNAP administrative records). See report for definitions of ACS household, constructed SNAP unit, and administrative SNAP unit.

Sources: USDA, Economic Research Service using data on New York residents from the U.S. Census Bureau's 2008-12 American Community Survey 1-year data and data extracted from New York SNAP agency records for calendar years 2007-12.

unit.[19] We also note again that the ACS-based measures (i.e., ACS households or constructed SNAP units) may also understate the proportion of one-person households relative to administrative SNAP units because we have not included the ACS group quarters file in our analysis sample. Nevertheless, the constructed SNAP units, whether measuring SNAP receipt from the ACS or the administrative records, better approximate the share of one-person administrative SNAP unit size.[20]

[19]Less than 2 percent of the administrative records were not PIKed and thus could not be linked to the ACS. It is possible that some one-person constructed SNAP units may not be identified as participating in SNAP because they could not be matched to these unPIKed administrative records.

[20]In the preceding analysis, we constructed from the monthly administrative records measures that conformed more closely to those based on the rolling reference period of the ACS. Another way to compare the linked data with the unlinked administrative records (but not the unlinked ACS) is to use the information on the number of months of receipt to generate these estimates on an average monthly basis. We do this by weighting our estimates by the number of months of participation during the reference period over the total number of months in the reference period. Using this approach, the difference in the distribution of constructed SNAP unit size more closely approximates administrative SNAP unit size. Since average monthly estimates weight more heavily units that participate for more months of the reference period, this result suggests that larger units tend to stay on SNAP longer. These results are available upon request.

The Effect of Household Definition and Source of SNAP Receipt Measure on the Distribution of SNAP Units by Poverty Level

Table 2 presents the distribution of SNAP households (units) by household (unit) annual income relative to poverty from 2008 to 2012. We first estimate this distribution based on the ACS definition of the household, determining the household's poverty guideline using the number of members in the ACS household.[21] The data reveal that the largest share of SNAP households are not those in deep poverty (at or below 50 percent of poverty) but rather those low-income units just above deep poverty (between 50 and 100 percent of poverty), which account for about one-third of participating households. This is consistent with recent research that has found that the incidence of safety-net benefits more generally, and SNAP benefits specifically, has shifted from households in deep poverty to households just above deep poverty (Ben-Shalom et al., 2013; Armor and Sousa, 2012). Lastly, according to these estimates, approximately 21 percent of SNAP households have gross annual income over 200 percent of poverty.

Table 2
Distribution of SNAP units in New York State by ACS-reported annual income relative to poverty and alternative measures of SNAP units and participation, 2008-12

			Ever-in-the-year SNAP receipt			
ACS-reported annual income relative to poverty	ACS households, all	Constructed SNAP units, all	ACS households with ACS SNAP receipt	Constructed SNAP units with ACS SNAP receipt	Constructed SNAP units with admin. SNAP receipt	Total effect
	(1)	(2)	(3)	(4)	(5)	(5) – (3)
	Percent[a,b]					*Percentage points*
< 50 percent	5.8	13.4	17.6	27.2	27.2	9.6
51-100 percent	8.2	10.5	33.1	31.9	33.4	0.3
101-130 percent	4.9	5.5	12.4	10.4	11.0	-1.4
131-200 percent	11.0	11.6	16.1	13.2	13.7	-2.4
>= 201 percent	70.1	59.0	20.8	17.3	14.7	-6.1
Total	100.0	100.0	100.0	100.0	100.0	0.0
Weighted number (Total across 2008-12)	36,610,051	50,412,172	5,159,517	7,960,027	8,021,431	

[a]Columns may not sum to 100.0 due to rounding.
[b]Standard errors associated with each percent estimate are all less than 0.01 percent and are available upon request.
Notes: SNAP refers to USDA's Supplemental Nutrition Assistance Program. ACS refers to American Community Survey. SNAP recipients refer to a group of people (as defined by one or another unit of analysis: the ACS household or constructed SNAP units) who receive SNAP benefits (as measured by one or another data source: the ACS or New York SNAP administrative records). See report for definitions of ACS household and constructed SNAP unit.

Sources: USDA, Economic Research Service using data on New York residents from the U.S. Census Bureau's 2008-12 American Community Survey 1-year data and data extracted from New York SNAP agency records for calendar years 2007-12.

[21]As explained earlier, these are not based on the poverty index variable provided in the ACS but rather an annualized measure from the FNS monthly poverty guidelines that are used to determine SNAP eligibility, weighted according to the number of months in a fiscal year spanned by a household's reference period.

The second column of table 2 retains the ACS-reported measure of SNAP receipt but uses constructed SNAP units in place of the ACS household definition. Poverty guidelines are calculated using the annual income and number of members of the constructed SNAP unit, not the ACS household. The most dramatic impact of switching from ACS households to constructed SNAP units occurs in the lowest tail of the distribution, among the proportion in deep poverty. Over the 5 years covered by our data, the proportion of SNAP households in deep poverty increases from 17.6 percent to 27.2 percent when measuring the participation and poverty status of constructed SNAP units rather than ACS households (columns 3 and 4). In the upper tail of the distribution, the proportion of units between 131 and 200 percent of poverty and above 200 percent of poverty decreases by about 3.0 and 3.5 percentage points, respectively.

The fifth column of table 2 retains constructed SNAP units as the unit of analysis but substitutes SNAP receipt recorded in the administrative records for SNAP receipt reported in the ACS. We define a constructed SNAP unit as participating in SNAP if, at some point during the reference period (of the ACS household in which the constructed SNAP unit members reside), any member of the constructed SNAP unit is determined to have received SNAP benefits according to the administrative records. The share of constructed SNAP units in deep poverty in this category is unchanged. Among constructed SNAP units with annual incomes above 200 percent of poverty, measuring SNAP receipt from administrative records leads to a decrease in the proportion of constructed SNAP units in this income category of about 2.6 percentage points.

The total effect on SNAP targeting from moving from ACS households and survey-based measures of SNAP to constructed SNAP units using administratively recorded SNAP receipt is to increase the proportion of SNAP units in deep poverty by 9.6 percentage points and to decrease the proportion of SNAP units between 131 and 200 and over 200 percent of poverty by 2.4 and 6.1 percentage points, respectively.

Incorporating Intensive Measures of SNAP Receipt

Measuring whether households received SNAP benefits at any point in the last 12 months, as is done in the ACS, provides a useful picture of program participation. Yet, such a measure is also somewhat limited. As previously noted, one reason that we might observe SNAP units with annual reported incomes in excess of the gross income limit for program eligibility is that these units only participated in the program for a portion of the year, when a transitory change in household income made them eligible for SNAP, and subsequently left the program once their income recovered. For these households, the total annual income reported in the ACS would exceed the annualized SNAP gross income limit. However, our previous measure of ever-in-the-year SNAP receipt does not distinguish between transitory and more permanent participation.

By linking administrative records to the ACS, we are able to provide a more differentiated picture of SNAP benefit recipients in a given year, augmenting our measure of ever-in-the-year participation with two measures of how intensively SNAP is used during the year: number of months of receipt and total value of benefits received. Our hypothesis is that higher annual income units will make less intensive use of SNAP, both in terms of number of months in the program and total value of benefits received, since these units are more likely to have experienced income fluctuations during the reference period that made them eligible for only part of the year.[22]

[22]It may not always be the case, however, that units leave the program in the same month that their monthly income exceeds the eligibility threshold. Procedural regulations usually delay State action by a month. SNAP recipients have 10 days to report a change, the State has 10 days to determine its action and notify recipients, and recipients have 10 days to file an appeal if they disagree with the action. State action before the appeal period expires is considered a State error.

Column 2 of table 3 displays the distribution of total SNAP benefits received by all constructed SNAP units during the reference period.[23] Relative to ever-in-the-year participation, shown in column 1, a greater proportion of total SNAP benefits received accrues to those in deep poverty. Constructed SNAP units in deep poverty receive nearly 1 in 3 SNAP dollars (31.7 percent), about 4 percentage points higher than the share of ever-in-the-year SNAP units in deep poverty. Another one-third of SNAP dollars go to low-income units above deep poverty. Fewer SNAP benefits go to constructed SNAP units with annual gross income above 130 percent of poverty: the share of benefits received by constructed SNAP units between 131 and 200 percent of poverty and over 200 percent of poverty is lower relative to ever-in-the-year participants by 1.6 and 2.0 percentage points, respectively.

The second intensive measure of SNAP participation that the linked data enable one to examine is the number of months a household received benefits in the reference period. As with annual benefit amounts, one would expect that households reporting higher annual income, particularly income in excess of the annualized SNAP gross income limit, would be more likely to qualify for program benefits on the basis of intra-year income fluctuations for only a portion of the year. Findings, displayed in columns 3 to 6 of table 3, support this hypothesis, showing that SNAP units with higher annual incomes make up a disproportionate share of units that received SNAP benefits for less than the full reference period.

Table 3
Distributions of constructed SNAP units by ACS-reported annual income relative to poverty and annual SNAP benefits, months of SNAP receipt, and ever-in-the-year receipt in New York State, 2008-12

ACS-reported annual income relative to poverty	Annual SNAP benefits	Months of SNAP receipt				Ever-in-the-year receipt (from table 2, column 5)
		1 – 6 months	7 – 9 months	10 – 12 month	13 months (whole period)	
	(1)	(2)	(3)	(4)	(5)	(6)
	Percent[a,b]					
Less than 50 percent	31.7	26.8	28.1	30.7	26.1	27.2
51-100 percent	33.3	18.8	23.5	29.0	40.9	33.4
101-130 percent	10.1	10.4	11.8	10.8	11.1	11.0
131-200 percent	12.1	18.5	16.6	13.8	11.8	13.7
201 percent or more	12.7	25.5	19.9	15.7	10.2	14.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Weighted number (Total across 2008-12)	8,021,431	1,434,281	688,521	1,365,005	4,533,623	8,021,431

[a]Columns may not sum to 100.0 due to rounding.
[b]Standard errors associated with each percent estimate are all less than 0.01 percent and are available upon request.
Notes: SNAP refers to USDA's Supplemental Nutrition Assistance Program. ACS refers to American Community Survey. See report for definition of constructed SNAP unit.

Sources: USDA, Economic Research Service using data on New York residents from the U.S. Census Bureau's 2008-12 American Community Survey 1-year data and data extracted from New York SNAP agency records for calendar years 2007-12.

[23]Appendix tables 1 and 2 replicate tables 3 and 4, respectively, but substitute the ACS household for the SNAP unit. These appendixes again highlight that employing the ACS households, in place of our constructed SNAP units, results in poorer targeting of SNAP to lower income households, even when SNAP receipt is measured in terms of number of months of receipt and the total annual benefit amount received.

Constructed SNAP units with annual gross income above 200 percent of poverty account for only about 10 percent of units that participated for the entire reference period of 13 months, but they account for roughly one-quarter of units that participated for 1 to 6 months. Moreover, the share of full-year SNAP units in the over-200-percent-of-poverty category is about 4.5 percentage points lower than the share of ever-in-the-year SNAP units. By contrast, SNAP units at or below poverty make up 67 percent of all units that received benefits for the entire reference period.

Low-income units above deep poverty account for 41 percent of full-year SNAP units—about 7.5 percentage points higher than their share of ever-in-the-year SNAP units—while units in deep poverty account for only about 26 percent of full-year SNAP units. The proportion of units in each of these two income groups that receive benefits for nearly the entire year (10 to 12 months), however, is similar. It may be that low-income units above deep poverty find themselves in a more permanent condition of poverty but are kept out of deep poverty by assistance from other programs. Some units in deep poverty, on the other hand, may only experience the condition for a brief spell, due perhaps to an employment shock. And, if these units do not anticipate a lengthy spell in poverty (and if they have savings to draw down), they are less likely to rely on SNAP for long-term support.

In sum, when using SNAP administrative records to refine the ever-in-the-year measure of SNAP participation available in the ACS to include intensive measures of participation, we find that SNAP is better targeted toward households at or below the poverty threshold, with low-income households above deep poverty making the most intensive use of the program, both in terms of the number of months of receipt and total value of benefits received.

We look next at the impact of income imputation in the ACS on our estimates of SNAP targeting. Nearly one-third of constructed SNAP units in our sample have some portion of their income imputed. Imputation of income in ACS relies on a statistical procedure called hot deck imputation, which assigns values for the missing income values from similar survey observations, where similarity is measured along only a few dimensions. Since SNAP receipt is not one of the variables used to find so-called donor observations to impute missing values (although some of the variables used may well be correlated with SNAP receipt), it is possible that the distribution of imputed income will not necessarily match the distribution of self-reported income in the subpopulation of SNAP recipients. It is not clear a priori how income imputation will impact our results. But given that such a large fraction of our population of interest did not respond to at least one income item in the survey, the potential for bias exists.

Column 2 of table 4 shows how results for the ever-in-the-year participant population change when we omit units with any imputed income. Roughly one-third of the weighted count of SNAP units have some portion of their income imputed in the ACS. We acknowledge that simply dropping such a large number of observations from our sample based on these criteria, which are likely not random with respect to the observed or unobserved characteristics of the unit, introduces a different type of bias. Future work can explore the effect of different imputation schemes on these estimates.

The most notable change when units with imputed income are omitted is again evident at higher levels of income relative to poverty (the last column in tables 3 and 4). The share of constructed SNAP units with annual income above 200 percent of poverty declines nearly 5 percentage points. Among SNAP units in poverty, when units with imputed income were dropped, the proportion in deep poverty increased 1.5 percentage points, and the proportion above deep poverty increased about 4.5 percentage points.

Table 4

Distributions of constructed SNAP units with no ACS-imputed income by ACS annual income relative to poverty and annual SNAP benefits, months of SNAP receipt, and ever-in-the-year receipt in New York State, 2008-12

ACS-reported annual income relative to poverty (excluding imputed income)	Annual SNAP benefits	Months of SNAP receipt				Ever-in-the-year receipt
		1 – 6 months	7 – 9 months	10 – 12 month	13 months (whole period)	
	(1)	(2)	(3)	(4)	(5)	(6)
	Percent[a,b]					
Less than 50 percent	34.4	29.8	30.0	34.0	28.7	28.7
51-100 percent	34.6	20.3	25.8	32.6	38.0	38.0
101-130 percent	10.2	11.0	12.8	10.9	11.3	11.3
131-200 percent	11.4	18.7	16.6	12.1	12.4	12.4
201 percent or more	9.8	20.3	14.8	10.4	9.6	9.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Weighted number (Total across 2008-12)	5,442,970	953,173	450,225	913,963	3,125,609	5,442,970

[a]Columns may not sum to 100.0 due to rounding.
[b]Standard errors associated with each percent estimate are all less than 0.01 percent and are available upon request.
Notes: SNAP refers to USDA's Supplemental Nutrition Assistance Program. ACS refers to American Community Survey. See report for definition of constructed SNAP Unit.

Sources: USDA, Economic Research Service using data on New York residents from the U.S. Census Bureau's 2008-12 American Community Survey 1-year data and data extracted from New York SNAP agency records for calendar years 2007-12.

We perform the same exercise for our two intensive measures of participation: total value of benefits received and months of receipt. The second column of table 4 (compared with the same column in table 3) shows that the changes in the shares of total benefits received by poverty level are similar to those that occur for ever-in-the-year participation when units with imputed income are omitted. The proportion of benefits received by constructed SNAP units with annual income above 200 percent of poverty declines by nearly 3.0 percentage points, while the proportions of benefits received by those in deep poverty and in poverty but above deep poverty increase by roughly 2.7 and 1.3 percentage points, respectively.[24] The effect of restricting the sample to units with no imputed income is similar for the distribution of months on SNAP: constructed SNAP units in poverty account for a larger proportion of full-year participants, while those above 200 percent of poverty account for a smaller proportion of all constructed SNAP units when only nonimputed income is considered.

[24]A result that, at first glance, may appear curious is that despite accounting for 26 percent of full-year participants, units in deep poverty receive only 32 percent of annual benefits, a considerably lower proportion than in the SNAP QC data. Two differences between our data and the QC data are likely driving this result. One is the difference in time period, which means our data contain substantially more units with annual income above poverty, and over 130 percent of poverty, receiving benefits. Second, unlike in the QC, our snapshot of the SNAP unit does not necessarily reflect the composition of the SNAP unit over the 12-month reference period. Units, or even individuals in a unit, may have experienced a deep poverty spell during the year even though their total annual unit income was above deep poverty.

Characteristics of SNAP Units With Annual Income Above 130 Percent of Poverty Descriptive Analysis

Finally, the study examines more closely the composition of constructed SNAP units with gross annual income above the SNAP gross income limit. Factors that help account for this effect were discussed earlier. Table 5 examines the proportion of higher income constructed SNAP units (i.e., those above 130 percent of poverty) that include children, elderly members, members with disabilities, and members that worked full-time for at least a portion of the year. Among these units with higher annual incomes, 27.5 percent had a member who reported a disability; the share increases to 28.0 percent when excluding units with imputed income. The shares with elderly members were 21.8 and 22.2 percent, respectively, and those with children under age 5 were 17.8 and 19.1 percent, respectively. Nearly three-quarters of these constructed SNAP units with higher annual incomes contained a child, elderly member, or member reporting a disability. Constructed SNAP units with at least one member who worked during the reference period accounted for more than three-quarters of all higher annual income constructed SNAP units. And, taken together, almost 98 percent of units with annual income above 130 percent of poverty had at least one member belonging to one of these four demographic groups.

Table 5
Selected characteristics of constructed SNAP units with ACS-reported annual income above 130 percent of poverty in New York State, 2008-12

	Constructed SNAP units	Constructed SNAP units with nonimputed income
	(1)	(2)
Single characteristics	*Percent*[c]	
At least one member is disabled[a]	27.5	28.0
At least one member is elderly (age 60 or older)	21.8	22.2
At least one member is a young child (age 4 or younger)	17.8	19.1
At least one member worked in the last 12 mos.[b]	78.8	76.4
Combinations of characteristics		
At least one member is disabled *or* is elderly *or* is a child	53.4	55.0
At least one member is disabled *or* is elderly *or* is a child, *and* a member worked in the last 12 mos.[b]	97.4	96.8
Weighted number (Total across 2008-12)	8,021,431	5,442,970

[a]Disability is measured as self-reported disability in the American Community Survey.
[b]Work in the last 12 months is measured as self-reported employment in the American Community Survey.
[c]Standard errors associated with each percent estimate are all less than 0.01 percent and are available upon request.
Notes: SNAP refers to the Supplemental Nutrition Assistance Program. ACS refers to American Community Survey. See report for definition of constructed SNAP unit.

Sources: USDA, Economic Research Service using data on New York residents from the U.S. Census Bureau's 2008-12 American Community Survey 1-year data and data extracted from New York SNAP agency records for calendar years 2007-12.

This descriptive analysis provides new evidence of the demographic makeup of these constructed SNAP units with higher annual incomes. The results fit with the prior notion that units with higher annual income would be those with members to whom special eligibility provisions apply, such as the elderly and disabled, as well as those more likely to be subject to income volatility—namely, the working poor. Some measurement issues remain and cannot be resolved with these data. For example, one cannot determine income and household composition in each month of the ACS reference period. Further research on those issues will need to examine other longitudinal data sources, such as SIPP.

Multivariate Analysis

The preceding analysis has been descriptive, looking at one or two variables at a time. We now examine in a multivariate framework the characteristics associated with units that receive SNAP at some time during the year despite annual gross income above 130 percent of poverty. We use a logit model to estimate the odds that a constructed SNAP unit reports annual gross income in the ACS above 130 percent of poverty. The multivariate framework enables us to isolate the importance of individual factors, holding other factors constant in the form of an odds ratio, a relative measure of the effect. For variables with more than two categories, the odds ratio is relative to the omitted category. Note that we are merely estimating correlations and not a causal relationship. The exponential function of the regression coefficient is the odds ratio associated with a one-unit increase in the characteristic being examined. These odds ratios are reported in table 6.

One of the largest factors affecting the odds of being a SNAP participant in the higher annual income groups is imputed income. Units that have any imputed income are more than twice as likely to have annual income above 130 percent of poverty as households with no imputed income.

We also evaluate the association of a unit being a current SNAP recipient; that is, receiving SNAP benefits as of the interview date.[25] We find that current receipt by the constructed SNAP unit is associated with 30 percent lower odds of reporting high annual income. Constructed SNAP units with elderly individuals in the household are nearly 2.5 times more likely to report annual income above the eligibility cutoff than those with no elderly. Units with disabled members are 20 percent more likely to fall in the higher annual income category. Recall that units with one or more elderly or disabled members are not subject to the gross income test, and their shelter-expense deductions are not capped, so we expect that some of these units will qualify for SNAP despite reporting gross annual income above the Federal gross income threshold.

The results of our logit model also reveal gradients in total benefit amount and in number of weeks worked during the reference period of the primary worker in the unit. Units with total annual benefits between $1,001 and $2,000 are 35 percent less likely to have annual income above 130 percent of poverty relative to units with annual benefits of $1,000 or less. This result confirms the finding

[25]We previously discussed that when SNAP receipt occurs at some point prior to the ACS interview, we can be less certain that the composition of the household, much less that of the SNAP unit, reported in the ACS reflects well the composition of the household when any member last received SNAP. It may also be that income, although reported on an annual basis, more accurately reflects household income while on SNAP for current recipients. This might occur, for example, if respondents have a tendency to report income over the reference period by extrapolating income received in more recent months over the entire reference period, rather than actually summing the amount of income received in each of month of the reference period. Hence, a SNAP unit's circumstances, such as composition and possibly even income, are more likely to accurately reflect those prevailing at the time of a unit's last SNAP receipt if SNAP receipt coincides with the ACS interview date.

Table 6

Logistic regression results: Constructed SNAP units' characteristics correlate with higher and lower annual income relative to poverty in New York State, 2008-12

	Income relative to poverty > 130		Income relative to poverty <= 100	
	Odds ratio	SE	Odds ratio	SE
Unit size	0.75*	0.011	1.28*	0.017
Current receipt	0.74*	0.024	1.22*	0.036
Any imputed income	2.19*	0.055	0.55*	0.011
CSU size does not match ASU	1.26*	0.033	0.87*	0.020
Any children (under age 5) in unit	0.90*	0.032	1.06	0.035
Any elderly in unit	2.35*	0.077	0.42*	0.013
Any disabled in unit	1.23*	0.029	0.73*	0.016
Number of workers	1.45*	0.130	0.71*	0.072
Months on SNAP:				
7 to 9	1.10*	0.048	0.74*	0.031
10 to 12	1.12*	0.042	0.69*	0.026
13	1.09*	0.038	0.67*	0.025
Total annual unit benefit ($):				
1,001 to 2,000	0.65*	0.025	1.68*	0.053
2,001 to 4,000	0.47*	0.019	2.83*	0.100
4,001 to 7,500	0.31*	0.014	4.80*	0.200
Over 7,500	0.25*	0.022	6.79*	0.600
Primary worker in CSU:				
Weeks worked last year:				
40 to 49	0.59*	0.0320	1.66*	0.087
27 to 39	0.31*	0.0160	3.22*	0.150
14 to 26	0.17*	0.0110	6.16*	0.310
1 to 13	0.08*	0.0043	12.5*	0.560
If 0 weeks worked, last worked:		.		
1 to 5 years ago	0.130*	0.0130	8.62*	0.92
Over 5 years ago or never	0.081*	0.0077	12.7*	1.39
Secondary worker in CSU:				
Weeks worked last year:				
40 to 49	0.59*	0.054	1.75*	0.22
27 to 39	0.43*	0.040	2.06*	0.23
14 to 26	0.29*	0.027	3.36*	0.32
1 to 13	0.21*	0.017	5.24*	0.47
If 0 weeks worked, last worked:				
1 to 5 years ago	0.32*	0.043	3.48*	0.52
Over 5 years ago or never	0.29*	0.035	3.87*	0.56
No secondary worker	0.19*	0.023	6.78*	0.95
N	8,021,418			

Notes: Coefficients represent odds ratios. Models also control for survey year effects and a constant term. Estimation was performed using ACS replicate weights, adjusted for the probability that a CSU received a valid Protected Identification Key. Significance levels: *.05. As described in the text, ASU refers to administrative SNAP units and CSU refers to our constructed SNAP units.

Sources: USDA, Economic Research Service using data on New York residents from the U.S. Census Bureau's 2008-12 American Community Survey 1-year data and data extracted from New York SNAP agency records for calendar years 2007-12.

in the descriptive analysis that higher annual income units receive less SNAP benefits. The primary worker is defined as the member with the highest reported work effort in the unit. We also examine the association with unit poverty level with the work effort of the secondary worker in the unit (i.e., the worker with the second highest work effort). A similar decreasing, but less steep, gradient is evident for the secondary worker. Higher total benefit amounts and fewer weeks worked (or more time since last period of employment) are associated with lower odds of reporting annual income above 130 percent of poverty. The strong attachment to work, in particular, is consistent with the hypothesis that many of the constructed SNAP units with high annual income are working units experiencing income volatility that may result from inconsistent attachment to the labor market.

Conclusion

Using the linked administrative SNAP records from New York State with the ACS, this study evaluates SNAP targeting by estimating annual distributions of SNAP units, SNAP benefit amounts, and the number of months of SNAP receipt, each by the annual poverty level of the SNAP unit. We observed that, similar to Armor and Sousa (2012), the proportion of ACS households reporting annual household income above 130 percent of poverty with any (survey-reported) SNAP receipt during the year is larger than that found on an average monthly basis in the SNAP FNS research data. Substituting constructed SNAP units for ACS households and administratively recorded SNAP receipt for survey-reported receipt showed that a greater proportion of lower income units receive SNAP benefits in a year than do higher income units.

An indepth analysis of total benefit amounts and number of months of receipt in the year reveals household units with lower annual income use SNAP more intensively than higher annual income households. This latter finding, in particular, suggests that many of the SNAP units that report annual income above the Federal gross income threshold have experienced changes in income (and possibly unit composition) that made them eligible for part of the year. Income imputation in the ACS also affects the picture of SNAP targeting. Restricting the universe to units with no imputed income also showed improved targeting to lower income units.

As the only national household survey capable of producing small area estimates for a range of demographic and economic characteristics on an annual basis, including SNAP receipt, the ACS is a vital tool for understanding spatial and temporal patterns of SNAP receipt throughout the country (see, for example, Newman and Scherpf (2013)). This study leveraged the large State-level sample size and rich demographic information in the ACS to analyze the targeting of SNAP benefits by poverty level. Linking SNAP administrative records from New York State enables us to overcome a number of the key measurement issues related to SNAP in the ACS, such as the under-reporting of receipt and the absence of information on benefit amounts and on the number of months of receipt in the year.

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Appendix

The 12-month rolling reference period in the ACS makes it difficult to directly compare constructed SNAP units and ACS households, which rely on one-point-in-time reports of household rosters in the ACS, to the administrative SNAP units, which reflect month-to-month changes in unit composition. As discussed in the report, for each respondent household in the ACS, the reference period over which both income and SNAP receipt are measured extends 12 months prior to the interview data, and interviews in the ACS are staggered throughout the 12 months of the calendar year. So, for example, a household interviewed in January 2010 would be asked about income and SNAP receipt dating back to January 2009. The last group of households in the 2010 ACS is interviewed in December 2010, and their reference period would extend from December 2009 to November 2010 (Czajka et al., 2012). In total, the 2010 ACS comprises twelve 12-month reference periods that cover January 2009 to November 2010. Note that we follow Czajka et al. (2012) in taking as the end reference period the month prior to the ACS interview month. In order to create estimates of the total number of participating administrative SNAP units comparable to those in the ACS, we took the average of the weighted count of ever-in-the-year participating units in the 2 calendar years corresponding to the overall reference period of each ACS survey year, dropping December of the current year—a month that, under the assumptions in Czajka et al. (2012), does not fall in any respondent household's reference period. For example, to compare administrative SNAP unit counts to constructed SNAP unit and ACS household counts in the 2010 ACS, we first dropped December 2010 observations in the administrative records and then took the average of the number of administrative SNAP units that participated in any month of 2009 and 2010 (minus December).

Appendix table 1

Distributions of ACS households by ACS-reported annual income relative to poverty and annual SNAP benefits, months of SNAP receipt, and ever-in-the-year receipt in New York State, 2008-12

ACS-reported annual income relative to poverty	Annual SNAP benefits	Months of SNAP receipt				Ever-in-the-year receipt
		1 – 6 months	7 – 9 months	10 – 12 months	13 months (whole period)	
	(1)	(2)	(3)	(4)	(5)	(6)
	----------*Percent*[a,b]----------					
Less than 50 percent	24.1	14.9	15.9	20.9	18.3	17.6
51-100 percent	34.4	20.2	25.5	29.7	38.3	33.1
101-130 percent	11.6	13.2	13.5	11.9	12.6	12.4
131-200 percent	14.1	21.9	20.8	16.6	14.4	16.1
201 percent or more	15.9	29.7	24.3	20.9	16.4	20.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Weighted number (Total across 2008-12)	4,789,293	475,897	313,291	783,183	3,216,921	5,159,517[c]

[a]Columns may not sum to 100.0 due to rounding.
[b]Standard errors associated with each percent estimate are all less than 0.01 percent and are available upon request.
[c]Weighted household counts in column (6) do not equal the weighted household counts in column (2) or the sum of weighted counts (3) through (6) because those totals are based on measures of SNAP receipt derived from the linked to the NY administrative records, whereas the totals in column (5), as in column (3) of table 2, are based solely on the ACS measure of ever-in-the-year SNAP receipt.
Notes: SNAP refers to the Supplemental Nutrition Assistance Program. ACS refers to American Community Survey. See report for definition of constructed SNAP unit.

Sources: USDA, Economic Research Service using data on New York residents from the U.S. Census Bureau's 2008-12 American Community Survey 1-year data and data extracted from New York SNAP agency records for calendar years 2007-12.

Appendix table 2

Distributions of constructed ACS households with no ACS-imputed income by ACS annual income relative to poverty and annual SNAP benefits, months of SNAP receipt, and ever-in-the-year receipt in New York State, 2008-12

ACS-reported annual income relative to poverty (excluding imputed income)	Annual SNAP benefits	Months of SNAP receipt				Ever-in-the-year receipt
		1 – 6 months	7 – 9 months	10 – 12 months	13 months (whole period)	
	(1)	(2)	(3)	(4)	(5)	(6)
	----------*Percent*[a,b]----------					
Less than 50 percent	26.4	16.4	17.1	22.9	18.9	18.6
51-100 percent	39.9	22.2	29.2	35.5	44.8	38.9
101-130 percent	11.7	15.5	15.3	12.8	13.0	13.3
131-200 percent	12.0	22.0	20.8	15.0	12.7	14.8
201 percent or more	10.0	23.9	17.6	13.8	10.6	14.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Weighted number (Total across 2008-12)	3,177,438	314,403	202,796	504,515	2,155,725	3,376,899[c]

[a]Columns may not sum to 100.0 due to rounding.
[b]Standard errors associated with each percent estimate are all less than 0.01 percent and are available upon request.
[c]Weighted household counts in column (6) do not equal the weighted household counts in column (2) or the sum of weighted counts (3) through (6) because those totals are based on measures of SNAP receipt derived from the linked to the NY administrative records, whereas the totals in column (5), as in column (3) of table 2, are based solely on the ACS measure of ever-in-the-year SNAP receipt.
Notes: SNAP refers to the Supplemental Nutrition Assistance Program. ACS refers to American Community Survey. See report for definition of constructed SNAP unit.

Sources: USDA, Economic Research Service using data on New York residents from the U.S. Census Bureau's 2008-12 American Community Survey 1-year data and data extracted from New York SNAP agency records for calendar years 2007-12.