

ELDERLY POVERTY AND SUPPLEMENTAL SECURITY INCOME

by Joyce Nicholas and Michael Wiseman*

In the United States, poverty is generally assessed on the basis of income, as reported in the Current Population Survey's (CPS's) Annual Social and Economic Supplement (ASEC), using an official poverty standard established in the 1960s. The prevalence of receipt of means-tested transfers is underreported in the CPS, with uncertain consequences for the measurement of poverty rates by both the official standard and by using alternative "relative" measures linked to the contemporaneous income distribution. The article reports results estimating the prevalence of poverty in 2002. We complete this effort by using a version of the 2003 CPS/ASEC for which a substantial majority (76 percent) of respondents have individual records matching administrative data from the Social Security Administration on earnings and receipt of income from the Old-Age, Survivors, and Disability Insurance and Supplemental Security Income (SSI) programs. Adjustment of the CPS income data with administrative data substantially improves coverage of SSI receipt. The consequence for general poverty is sensitive to the merge procedures employed, but under both sets of merge procedures considered, the estimated poverty rate among all elderly persons and among elderly SSI recipients is substantially less than rates estimated using the unadjusted CPS. The effect of the administrative adjustment is less significant for perception of relative poverty than for absolute poverty. We emphasize the effect of these adjustments on perception of poverty among the elderly in general and elderly SSI recipients in particular.

Introduction

The decline in the elderly poverty rate is often cited as a major accomplishment of national poverty policy. From 1966 through 2006, the official poverty rate for persons 65 or older declined from 28.5 percent to 9.4 percent. In 1966, elderly poverty exceeded that of adults aged 18–65 by 18 percentage points. By 1993, parity with the poverty rate of other adults was achieved, and since that year, the elderly poverty rate has generally been over a percentage-point lower than that registered for adults of “working age” (DeNevas-Walt, Proctor, and Smith 2007, 50).

Supplemental Security Income (SSI)—the nation’s safety net for the aged, blind, and disabled—presumably played some role in this decline and serves to ameliorate the consequences of poverty for those who remain poor. However, assessing the contribution of SSI payments to the reduction of elderly poverty raises three issues. First, receipt of SSI is significantly underreported, so any evaluation using standard sources—notably the Current Population Survey’s (CPS’s) Annual Social and Economic

Supplement (ASEC)—is likely unreliable (Roemer 2000; Weinberg 2006). Second, the federal SSI payment is not alone sufficient to move recipients out of poverty, so the SSI effect, if present, must occur in combination with other family resources. Third, as is widely appreciated, the poverty standard itself is controversial, and its modest empirical basis is outdated (Citro and Michael 1995; Weinberg 2006; Blank 2008).

This article addresses these measurement, context, and standards issues. On the measurement side, we investigate the consequences for perception of

Selected Abbreviations

ASEC	Annual Social and Economic Supplement
CPS	Current Population Survey
DER	Detailed Earnings Record
DI	Disability Insurance
FBR	federal benefit rate
FICA	Federal Insurance Contributions Act

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Selected Abbreviations—*Continued*

MEF	Master Earnings File
NRC	National Research Council
OASDI	Old-Age, Survivors, and Disability Insurance
PHUS	Payment History Update System
SECA	Self-Employment Contributions Act
SER	Summary Earnings Record
SGA	substantial gainful activity
SIPP	Survey of Income and Program Participation
SSA	Social Security Administration
SSI	Supplemental Security Income
SSN	Social Security number
SSR	Supplemental Security Record

poverty among the elderly of using administrative information from the Social Security Administration (SSA) on earnings and income from the Old-Age, Survivors, and Disability Insurance (OASDI) and SSI programs to adjust CPS/ASEC data for underreporting. We consider the consequence of adjustment of income for all family members, not the elderly alone. On the standards side, we compare results using the official “absolute” poverty measure that is based on a threshold fixed in real terms with outcomes when poverty is assessed using a “relative” measure, that is, with reference to the general income distribution. Our investigation is limited to the 2003 CPS/ASEC (covering incomes in calendar year 2002); it is our intention to create a template for duplication of this analysis for subsequent years in a companion article.

This work is informed by a substantial amount of earlier work by SSA analysts on procedures for merging administrative and survey data and for using the resulting hybrids to study the prevalence of poverty and dependence on OASDI and SSI benefits (see, for example, Sears and Rupp (2003); Koenig (2003); Koenig and Rupp (2004); and Fisher (2005)). We also refer to the labor economics literature on use of administrative data versus survey-derived information in analysis of earnings (Pedace and Bates 2000; Bound, Brown, and Mathiowetz 2001; Abowd and Stinson 2005; Dahl, DeLeire, and Schwabish 2008) and on the burgeoning Census Bureau (2007) work on the consequences of using alternative resource measures and poverty standards.

Combining census and administrative data is not simple, and results are sensitive to several important decisions concerning where credence should rest. The credence issue is particularly important in working with earnings data; our approach is to develop two adjusted measures of income, one largely restricted to administrative amounts and the other more inclusive of survey responses. Reality, we argue, probably lies somewhere between the two. We find that incorporation of administrative data under both the restrictive and inclusive adjustment procedures has substantial consequences for perception of the prevalence of poverty by either absolute or relative standards. Our adjustments reduce the estimated aggregate official poverty rate in 2002 for all persons from 12.1 percent to 9.3–11.8 percent; the estimated poverty rate among elderly SSI recipients is reduced from 48 percent to 38.6–39.9 percent. Estimated relative poverty among SSI recipients also declines, but the effect of our adjustments on inferences about the relative poverty of the elderly is less significant than the effect on the official poverty measure. We argue these results present a challenge to those who would rely on unadjusted data for inferences about the prevalence of poverty or program take-up. We suggest that further experimentation with combining administrative data with CPS data be given high priority. Such investigations should cover more years and incorporate administrative data on other sources of income.

To reach these conclusions, we take the following route. The next section presents a brief overview of the SSI program. The CPS and pertinent SSA administrative data are then reviewed. For a variety of reasons including their own choice, not all persons in households interviewed for the CPS can be matched to SSA administrative records. Next, we discuss procedures for data preparation and the prevalence of successful match. Our strategy for merging the CPS and administrative data is then outlined. We discuss three alternatives for handling the shortfall of our incomplete match. The section that follows reports the consequences for estimating the prevalence of poverty in 2002 and of incorporating administrative data using the official poverty standard. The effect of our adjustments on estimates of the total population of SSI recipients is also discussed in this section. We then repeat the analysis using a relative poverty measure. The last section presents our conclusions and suggestions for future research.

SSI: An Overview

Although our focus is on the elderly, we include rules pertinent to children and nonelderly adults because our data adjustments involve all persons. In general, the data we cite are for 2002, the focal year for our subsequent calculations.

The SSI program provides a basic monthly national income guarantee, called the federal benefit rate (FBR) to children and adults with disabilities (including the blind) as well as to persons aged 65 or older. The FBR is adjusted annually for inflation. In 2002, the FBR was \$545 per month (\$6,540 per year) for a single individual and \$817 (\$9,804 per year) for a couple (SSA 2003). SSI is intended to be a program of last resort. Accordingly, payments are reduced if an individual or a couple has earnings or other income or receives “in-kind support and maintenance” (ISM), and the amount depends as well on a person’s living arrangement. In all states¹ except one, the federal SSI payment is augmented for at least some SSI recipients by a state supplemental payment (SSA 2004). In most states, SSI recipients are also immediately eligible for Medicaid, and if they live alone they are categorically eligible for food stamps (except in California, where the food stamp benefit is incorporated into the state supplement).

To be eligible, SSI nonelderly (younger than age 65) applicants must pass a disability test. Both elderly and nonelderly individuals must meet the same income and resource requirements.

For persons aged 18 or older, financial eligibility requires that countable income (whether from work or other sources) be less than the current FBR plus, where available, any state supplement. Certain income exclusions are applied to the calculation of net income. SSI program rules exclude the first \$20 of income from all sources, \$65 of earned income (for a total exclusion from earnings of \$85 if the applicant or recipient does not have any unearned income), and half of any additional earnings beyond \$65. The FBR is reduced by one-third for applicants or recipients receiving food and shelter—ISM—in another’s household and not contributing to those expenses. Generally, resources cannot exceed \$2,000 for an individual and \$3,000 for a couple, but one’s home and automobile as well as certain other resources are not counted.

As for children less than 18 years of age, the financial eligibility requirements generally pertain to the parents, whose income from sources other than public assistance is partially deemed to the child. Before

any income is deemed to the child recipient, certain exclusions are applied to account for needs of other family members. The disability test for children is that the child must have a medically determinable impairment (or a combination of impairments) resulting in “marked and severe functional limitations.”

For persons aged 65 or older, only the financial test for SSI eligibility applies. The disability test for nonelderly adults is the same test used for Social Security Disability Insurance (DI) and is quite stringent. It requires that the applicant be either blind or have a physical or mental impairment that prevents him or her from engaging in any substantial gainful activity (SGA) and that has lasted or is expected to last for a continuous period of at least 12 months or to result in death. SGA is generally defined in terms of specific earnings thresholds. In 2002 the SGA standard was \$780 or more per month, so applicants judged capable of earning this much anywhere in the economy were ineligible for SSI. The threshold of SGA is automatically adjusted each year for changes in the average wage.

Once eligibility is established, the monthly SSI payment is simply the FBR (plus the applicable state supplement), less any countable income. Because eligibility is not determined by total household or even family income, a substantial number of SSI recipients living with persons other than their spouse are not poor, although by official standards anyone living on the FBR alone is. In 2002, the official poverty standard was \$9,359 for a nonelderly single person and \$8,628 if aged 65 or older; the standard was \$12,047 for a couple (again, nonelderly) and \$10,874 if the “householder” was aged 65 or older. The annualized FBR—\$6,450 per year for a single individual and \$9,804 per year for a couple—was therefore less than even the poverty standard applied to elderly persons. Despite this shortfall, it is possible for SSI payments, when considered in combination with the income of other family members, to lift persons, including the elderly, out of poverty as officially measured. For others, SSI fills at least a portion of the shortfall between income and the poverty threshold and moves them upward in the general income distribution.

The FBR is indexed so that the benefit stays constant in real terms.² However, the assets limits and various income exclusions were fixed in nominal terms before the interval studied here and hence declined in real terms by 25 percent from 1993 through 2002. This has presumably reduced access to SSI.

The Data

We work with 2002 data from the 2003 CPS/ASEC and contemporaneous administrative files.

The CPS

The CPS is a monthly survey of approximately 60,000 households conducted by the Census Bureau and the Bureau of Labor Statistics.³ This survey is the main source of information about employment characteristics of the civilian noninstitutionalized American population. The Bureau of Labor Statistics gathers information about the employment status of each member of an interviewed household, who is at least 15 years of age. The CPS provides household, family, and person-level data about employment, unemployment, earnings, hours of work, and other indicators. Additional data are collected in the ASEC for CPS households (and some others) on various family characteristics in addition to income received in the previous year (Census Bureau 2003).

The unweighted 2003 CPS/ASEC data set (covering income in calendar year 2002) consists of 216,424 person and 78,310 household observations. We exclude 564 children younger than 15 years of age who are unrelated to the reference person for their household or anyone else in the unit. This adjustment is required because no income data are collected for such persons; the same exclusion is applied by the Census Bureau in its poverty calculations. The exclusion reduces the sample to 215,860 members and the estimated size of the sampled population by about 0.2 percent, to 285,317,346 persons.

To protect confidentiality, income data in the CPS are subject to top- and bottom-coding. When reported amounts exceed certain thresholds, the actual amounts reported are replaced (top-coded) with average reported amounts for the same item for all surveyed persons with above-threshold amounts and identical (on certain dimensions) demographic characteristics. Bottom-coding occurs for losses from farm and nonfarm self-employment income. When persons are known to have received certain types of income but amounts are not reported, the Census Bureau imputes the missing amount using “hot-deck” methods. In this procedure, missing values are imputed using the amounts reported for a person with identical (on certain dimensions) demographic characteristics encountered earlier in the data adjustment process. It is possible for top- or bottom-coded amounts to be used in such imputations, depending on the data processing sequence.

SSA Administrative Files

Social Security’s administrative files of interest here include records of individual earnings in employment covered by the OASDI programs, OASDI benefits paid, and payments made from the SSI program. The data sources for these programs are the Summary Earnings Record (SER) and the Detailed Earnings Record (DER) for earnings, the Payment History Update System (PHUS) for OASDI, and the Supplemental Security Record (SSR) for SSI.

Summary Earnings Record. These data are an extract from SSA’s Master Earnings File (MEF). A primary MEF record is created when a person receives a Social Security number (SSN); thus every person in the CPS/ASEC for whom an SSN match was successfully accomplished will have an SER.

Detailed Earnings Record. This type of record is an extract from the MEF that includes data on total earnings from all sources, including wages and salaries and income from self-employment, which is subject to Federal Insurance Contributions Act (FICA) and/or Self-Employment Contributions Act (SECA) taxation. DER coverage extends to all earnings reported by employers on workers’ W-2 Forms, and the amounts are not capped.⁴ These data include deferred wages such as contributions to 401(k) retirement plans.⁵ Because individuals do not make SECA contributions if they lose money in self-employment, only positive self-employment earnings are reported in the DER. Our data are aggregated across all employers for each individual and include wage and salary income, income from self-employment, and deferred income. The data aggregation was performed by SSA’s Office of Research, Evaluation, and Statistics following a protocol established by the agency.

Payment History Update System (PHUS). These data record OASDI (or Social Security) benefits when paid. PHUS data include both total benefit and the amount of benefit subtracted for Medicare Part B premiums. A key feature of the PHUS is that monthly amounts recorded here represent actual payments, not entitlement. Hence if a person begins entitlement for a Social Security benefit in November 2001 but does not actually receive a check for the amount until February 2002, the payment will be recorded for 2002. This corresponds to income received as reported in the CPS/ASEC.⁶

Supplemental Security Record. This record provides the information that is needed to calculate and

distribute SSI payments. SSA typically creates an SSR record when an individual files an SSI application. Each person's record includes eligibility and payment information, as well as income information about ineligible spouses and parents that is pertinent to establishing and maintaining the individual's eligibility. SSR payments are recorded as disbursed. The SSR includes state SSI supplements if SSA makes the payment on the state's behalf. Thirty-four states, by 2002, had chosen to administer some or all of the supplementation themselves (SSA 2004, 7). Payments made in state-administered SSI supplement programs are not included in the SSR. For the most part, state supplements are small, and some of the largest (California, Massachusetts, and New York, for example) are federally administered (SSA 2004, 7). However, benefits in Alaska, Connecticut, Wisconsin, Minnesota, and a few other states are substantial and state administered. By far the largest state-administered state supplement is Alaska's. In 2002, that state added \$362 to the FBR for singles and \$528 to the FBR for couples living independently (SSA 2004, 13).

We do not have administrative data on sources of income other than wages and salaries, self-employment, OASDI, and SSI. For these other categories of income we must rely on the CPS.

The Match

The data we employ are the result of collaboration between SSA and the Census Bureau. The sources employed in the CPS/administrative data match are detailed in Appendix A.

The Procedure

CPS interviewers request SSNs for all persons aged 15 or older in each household in the address-based CPS household sample. Interviewees are not required to provide these data, but most do, or at least permit the Census Bureau to search SSA's administrative files for it using names, birth dates, and addresses. SSNs for persons younger than age 15 are all obtained by searching administrative data. Once collected, the CPS data are extensively reviewed and reorganized, missing values are imputed, and potentially identifiable outlier income values are top- or bottom-coded. Eventually a public-use data set is released that is the source of most official Census Bureau publications, including annual poverty estimates. The public-use data set includes unique numeric identifiers constructed by the Census Bureau for each household,

and for each person within the household a unique person identifier is included in the data set. These identifiers relate to file structure only and convey no information useful for determining the actual identity of CPS respondents.

At the time of release of the public-use CPS data, a special encrypted file is provided to SSA. This "cross-walk" file provides the SSN for each person in the CPS for whom an SSN has been reported, identified by the household sequence number and person identifier. At SSA, only one person has access to the cross-walk file. This person then uses the SSNs to construct SER, DER, PHUS, and SSR files for each person with a corresponding household sequence number and person identifier. Only the CPS identifiers are retained. We employ these extracts for calendar year 2002 in the following analysis. On the CPS side, we are working with the public-use CPS data sets available to all researchers.

The Outcome

Table 1 provides the first tabulation of the extent of match between the SER and our 2003 CPS/ASEC data. The analysis is based on age at the time of the March 2003 CPS/ASEC interview, so in some instances a person's age category will be one year greater than their age during all or part of 2002, when the earnings data are accumulated. Here and elsewhere we report separate tabulations for children (persons 0–17 years old), "working-age" adults (18–64 years old), the elderly (at least 65 years old), and various combinations.

The unweighted 2003 CPS/SER overall observation match rate is 76.5 percent.⁷ We do not have data to tell how much of the residual is attributable to failure to report an SSN versus reporting an SSN for which no records exist. In the material that follows, we concentrate on adults (persons at least 18 years old). For this group, the match rate is 71.6 percent. Matched observations tend to have slightly lower weights than unmatched ones, so the weighted match rate for adults (persons aged 18 or older) is 68.3 percent.

The match rates reported in Table 1 are based only on finding records in the SER with the same SSN as is reported by a respondent in the CPS or derived for children from administrative data. It is possible that the match for some individuals is false because of misreporting of the SSN in the CPS interview or because of multiple users of the same SSN in the SER. Some information on the quality of the match

Table 1.
The CPS/SER match: 2003 CPS/ASEC, by age group

Age group ^a	Total CPS records	Total CPS records with an SER match	Percent
0–17 ^b	66,016	57,763	87.5
18–64	129,460	93,472	72.2
At least 65	20,384	13,804	67.7
At least 18	149,844	107,276	71.6
All groups	215,860	165,039	76.5

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

- a. Age at time of CPS/ASEC interview.
- b. Sample excludes children younger than age 15 who are unrelated to others in their household. This exclusion is applied in all CPS poverty tabulations.

is provided by comparing age as reported in the CPS to age as computed from SSA records. To do this, we limited our comparisons to those persons whose age at the time of the interview, as recorded in the SER, was 74 or younger because the CPS top-codes age at 80. The results (available from the authors) are consistent with a good fit: Almost 99 percent of the adults in our matched group have a CPS age that differs from age recorded in SSA data by no more than a year. Interestingly, the fit is asymmetric. Almost all of the discrepancies are the result of a lower age report in the CPS than in SSA's data. We have also compared CPS and SSA data by sex, and the discrepancy for all three age groups is less than 1 percent. In the remainder of the analysis, we accept the entire CPS/SER match as valid, foregoing to another day the development of procedures for identifying and excluding erroneous matches (Herzog, Sheuren, and Winkler 2007).

The Merge

We turn now to procedures for merging the CPS data with SSA administrative records. The term “adjusted data” is used for any CPS-reported values that have been replaced with administrative data. Alteration in earnings records is discussed first, and then we detail reports of OASDI and SSI receipt. Many conflicts between income as reported in the CPS and recorded in administrative data are found; particularly with regard to components of earnings, there is little basis for choosing between the two. Therefore, we created “restrictive” and “inclusive” income-adjusted data sets using different assumptions about the relationship

between reported earnings and self-employment income in the CPS and administrative records. For this procedural summary, unmatched CPS respondents in the data set are retained, but later in the article we report outcomes for a sample restricted to persons in families with at least one person with a CPS/SER match. The data is then reweighted to adjust for variation in match rates across types of individuals. The CPS collects data on 17 types of income, from alimony to veterans' benefits to wages and salaries. Our adjustments involve only earnings—wage and salary and self-employment income. For all other sources the CPS amounts, including imputations and top-coded values, are retained.

The Strategy

The baseline for our calculations is income as reported in the public-use CPS/ASEC. We distinguish between our restrictive and inclusive assumptions at each step in the material that follows. Our procedural protocol is summarized in Appendix A. In general, the restrictive assumption set gives credence to administrative data when both administrative and CPS reports are available, and the inclusive assumption set gives credence to CPS income reports when such reports exceed amounts recorded in our administrative sources. Our procedure incorporates three important choices: (1) when we compare CPS data with income reported in the DER, we generally work with total earnings—the sum of wages and salaries and self-employment income—rather than distinguish between wages and salaries and income from self-employment; (2) we work with the DER, but accept CPS earnings reports in the absence of DER amounts; and (3) we rely wholly on SSA administrative sources for income from OASDI and SSI.

Aggregate Earnings. Roemer (2002, 12) argues that people report as wages or salaries in the CPS (and the Survey of Income and Program Participation (SIPP)) some income that is identified as “self-employment” income by their employers. Table 2 reproduces Roemer's example for the 2003 CPS/ASEC and presents the average distribution for 1990, 1993, and 1996 combined, based on his data. All the data here are for persons for whom a matched DER is available and who have reported wage and salary in the CPS. As the table indicates, Roemer, like us, finds substantial numbers of observations with wage and salary income in the CPS, but no wage and salary or self-employment income in the DER. He suggests these cases reflect the “underground” economy, where income is not

Table 2.
Number and percentage distribution of 2003 CPS/ASEC observations reporting wage and/or salary earnings in 2002, by presence of wages or self-employment income in the DER

DER earnings record group	2003 CPS/ASEC		Average for 1991, 1994, 1997—March CPS ^a
	Number	Percent	Percent
Wage and salary earnings reported in the DER; no self-employment income reported.	66,582	89.2	89.5
Wage and salary earnings reported in the DER along with self-employment income.	3,596	4.8	3.5
No DER wages and salary or self-employment present ("CPS underground").	2,872	3.8	5.2
No DER wages and salary present, but self-employment present ("CPS misclassification").	1,591	2.1	1.8
Total	74,641	100.0	100.0

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

NOTES: Sample is comprised of adult 2003 CPS/ASEC observations with matching SER data and positive reported wage and salary or self-employment income in the CPS.

a. From Roemer (2002, 12).

reported to the Internal Revenue Service. However, a significant number of persons with wage and salary income in the CPS have only self-employment income in the DER. Roemer denotes these cases as “CPS misclassification.” The prevalence of such cases is of the same order of magnitude in both Roemer’s and our data.

As indicated in Appendix A, we work around the problem of misclassification by focusing on total earnings as denoted by Roemer for relevant cases in which no component of CPS self-employment income has been imputed. Aside from such cases, the general rule applied is that for the restrictive adjustment, the DER self-employment income amount is used except in cases in which the DER self-employment income total is zero and the CPS indicates income loss. In these cases the negative CPS amount is used. For our inclusive alternative, CPS-reported income is used when the reported amounts are greater than what is recorded in the DER or, again, in cases of income loss not contradicted by the DER.

The DER. Beyond possible confusion between self-employment and wage and salary income, for many individuals there is considerable discrepancy between total earnings as reported in the DER and in the CPS. Table 3 sorts the 107,276 CPS adults with an SER match (see Table 1) on the basis of earnings

as reported in the DER. Nearly 3 percent (3,096) of these adults had no matching DER record at all; we treat their DER earnings as zero. For each of the 11 DER earnings categories, we compare the CPS report for total earnings with what is recorded in the DER. Several features of the data are important both for our reconstruction of the income distribution and interpretation of the results. First, a quarter of the matched respondents—26,589—have no DER earnings report at all. However, of this group a substantial number (3,986; see the bottom line of data in Table 3) have positive matching CPS records. Second, the four earnings categories covering the range \$1–\$39,999 account for over half (55 percent) of these adults. Within this range the overlap of the CPS and DER earnings distributions is reasonably good, generally with identical amounts reported in the CPS and the DER for median workers in each DER category and about half of all CPS reports falling within 25 percent or more of the corresponding DER total. Nevertheless, there is a lot of variance in the difference between the CPS and DER totals. The lowest earnings categories include significant numbers of self-employed persons reporting income losses; for such cases the CPS value is always lower than reported DER earnings. Despite these income-loss cases, on average, reports of adults with lower-range DER earnings have higher earnings in the CPS than are indicated in the DER.

Table 3.
Distribution of CPS earnings reports relative to DER values

DER earnings category (\$)	Earnings distribution		Observations with CPS earnings values less than or equal to 0		DER/CPS earnings ratio from .75 to 1.25		Median difference in DER-CPS earnings (\$)	Mean difference in DER-CPS earnings (\$)	Standard deviation of difference (\$)	CPS value imputed	
	Number	Percent	Less than 0	Equal to 0	Number	Percent				Number	Percent
Missing or zero ^a	26,589	24.8	193	22,410	...	...	0	-3,561	18,132	3,143	11.8
1-9,999	19,704	18.4	128	4,212	5,338	27.1	0	-4,581	19,272	4,616	23.4
10,000-19,999	14,965	13.9	45	695	7,825	52.3	-179	-4,218	21,295	3,718	24.8
20,000-29,999	13,563	12.6	15	267	9,205	67.9	0	-2,893	23,989	3,079	22.7
30,000-39,999	10,580	9.9	5	143	7,688	72.7	160	-1,894	25,411	2,310	21.8
40,000-49,999	6,860	6.4	8	76	5,110	74.5	521	-739	29,521	1,386	20.2
50,000-59,999	4,561	4.3	6	40	3,325	72.9	1,219	1,025	30,205	923	20.2
60,000-69,999	2,992	2.8	3	27	2,125	71.0	1,328	792	38,103	641	21.4
70,000-84,899	2,663	2.5	3	24	1,876	70.4	2,553	3,735	38,271	544	20.4
84,900-199,999	3,998	3.7	5	42	2,477	62.0	7,654	13,231	59,105	905	22.6
200,000 or more	801	0.7	0	6	185	23.1	100,724	153,881	403,502	241	30.1
Total	107,276	100.0	411	27,942	45,154	42.1	0	-1,125	45,364	21,506	20.0
Zero DER; ^a CPS greater than 0	3,986	3.7	...	...	...	...	-14,000	-23,755	41,396	1,677	42.1

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

NOTES: This table consists of unweighted adult CPS respondents with an SER match.

... = not applicable.

a. Includes adults with no DER match.

At earnings levels above \$50,000 there is a reversal of pattern. In this range the DER earnings totals on average are higher than amounts reported in the CPS, with the most dramatic differences occurring at the highest levels. Interpretation of these outcomes is complicated by the high incidence of imputations; overall, one out of five of the matched adult observations has some element of earnings imputed. These imputations add substantially to both the mean and variance of the difference between CPS and DER earnings reports.

Clearly more investigative work could be done, but developing alternative imputation approaches for the CPS is beyond the scope of this article. Instead, we fall back to development of the two alternatives. For the restrictive estimates, we distinguish between observations with zero and positive DER values. In cases with a positive DER amount, we use the DER report minus any self-employment income loss reported in the CPS. For cases with an SER match and no DER

earnings (as well as all adults without a match), we opt to accept the CPS amount. We do this largely on the basis of suspicion that the CPS captures unreported income and concern that disregarding the Census Bureau report altogether is too restrictive in instances in which evidence (from the CPS interview) exists that work has occurred. Our inclusive estimate is generally the greater of the CPS and DER amounts unless no earnings are reported in the DER, and the CPS includes a self-employment income loss. For these individuals the CPS value is employed. One implication is that our inclusive estimate includes some cases in which a CPS imputation or top-coded amount is used in place of a lesser DER value.⁸

Administrative Data on Benefits. For OASDI and SSI, we rely on SSA administrative data for both our restrictive and inclusive income adjustments. Incorporation of OASDI and SSI administrative data is complicated by the absence of administrative information on state-administered SSI supplements and evidence

that CPS respondents sometimes confuse SSI payments with OASDI benefits. This confusion problem is illustrated by the tabulation reported in Table 4.

We have 2,800 CPS/ASEC adult observations in the CPS that are known from the SSR match to have received SSI payments in 2002. Table 4 divides these observations between those for whom SSI was also reported in the CPS and those for whom the CPS indicates no SSI receipt. Note the following: For individuals reported to the CPS interviewer to be SSI recipients, the average amount (\$4,671) is quite similar to the average amount recorded in the SSR (\$4,592). Moreover, the average SSI payment recorded in the SSR is on the same order of magnitude for adults with and without positive CPS SSI records. As would be expected given that state-administered SSI supplements are not captured by the SSR, the average benefit reported in the CPS exceeds the average benefit recorded in the SSR for the same adults.

The last two columns in Table 4 show average OASDI amounts from the CPS and the PHUS for the adults with a CPS/SSR match and positive benefit values from the CPS and/or PHUS's OASDI records. In general the CPS totals are greater. As anticipated, the differential between the CPS and the PHUS's OASDI reports is larger for people identified as SSI recipients by the SSR, but for whom no SSI payments are recorded in the CPS. However, the offset is not complete. The average SSI *plus* OASDI benefit for those reporting SSI and OASDI in the CPS is \$4,671 + \$5,892 = \$10,563. For those not reporting SSI (but known to have received it), reported OASDI is substantially larger (\$7,382 versus \$5,892), but the amount falls short of the combined SSI (\$4,400) and OASDI

(\$5,431) averages (\$9,831) from the administrative data. Given state supplementation, the combined CPS amount should exceed, not fall short of, this amount.

We have confirmed what was already well known—receipt of SSI is substantially underreported in the CPS.⁹ It is possible that some CPS respondents are confusing SSI with OASDI. It would be easy to do so because both programs are administered by SSA and individuals may apply for SSI and OASDI benefits at the same office. Both programs fall under the jurisdiction of SSA and may be easily confused. If such confusion does in fact exist, we should expect to see greater reported OASDI in the CPS among known SSI recipients who fail to report SSI than is the case for individuals who correctly report SSI receipt. We do find this to be true. However, such evidence is not definitive without additional control; it is possible that underreporting of SSI increases with the size of one's Social Security entitlement, and hence those failing to report SSI might be expected to have larger OASDI income. Nevertheless, we conclude that both underreporting and misreporting are present in the data.¹⁰

Given the misreporting problem, our income adjustment is focused on the combined SSI and OASDI payment. Again, we distinguish between individuals with and without an SER match. For individuals without an SER match, we utilize the sum of SSI and OASDI amounts as reported in the CPS and accept positive-reported SSI income as indeed indicating SSI receipt. For persons with an SER match, the following rules are applied to both our restrictive and inclusive calculations. In this case, we take SSA administrative data from the PHUS and SSR as truth and make adjustments only in instances in which state supplements are

Table 4.
Average reported SSI and OASDI benefits, by SSI reporting status: CPS/SSR matched adult sample, 2002

CPS SSI benefit category	Observation counts	SSI		OASDI	
		In CPS	In SSR	In CPS	In PHUS
Number of positive values					
Reports of positive SSI receipt	1,681	1,681	1,681	719	744
Reports of negative SSI receipt	1,119	0	1,119	658	531
Total	2,800	1,681	2,800	1,377	1,275
Average benefit values of observations with positive values (\$)					
Reports of positive SSI receipt	1,681	4,671	4,592	5,892	5,039
Reports of negative SSI receipt	1,119	0	4,400	7,382	5,431

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

not included in these sources. If the person resides in a state with no universal state supplement or in which the state supplement is federally administered, we utilize the sum of the SSI amount reported in the SSR and the OASDI amount reported in the PHUS. If there is no SSR and/or PHUS match, SSI and/or OASDI are recorded as zero. By “universal” we mean a supplement paid to all or virtually all SSI recipients. This adjustment applies to both the restrictive and inclusive calculations. If the person resides in a state with a universal *state*-administered SSI supplement, we again utilize the sum of the SSI amount reported in the SSR and the OASDI amount reported in the PHUS. To this we add an estimate of the state-administered supplement.¹¹ The restrictive and inclusive estimates differ only on the basis of the number of months out of the year in which the person receives assistance; among most persons with positive SSR SSI records, the amounts are identical. Detail on federally and state-administered SSI supplements and the imputation procedures we follow appear in Appendix B.

The Outcome

Table 5 presents the outcome of these income adjustments, differentiating observations by their CPS/SER match status and whether their earnings or SSI/OASDI totals were changed. The table has two panels, one incorporating the restrictive adjustments and the other incorporating the inclusive adjustments. To get a sense of the total impact, it is necessary to sum the individuals for whom total SSI and OASDI payments were adjusted (the totals for rows 1 and 3) with the individuals with earnings changes but no alteration in SSI plus OASDI income (the amounts in the two earnings alteration columns in row 2). Given restrictive adjustments, this is 8,815 + 12,865 + 32,745 + 45,404 = 99,829—46 percent of all persons in the CPS and 61 percent of all CPS/SER matched observations. The inclusive calculation retains CPS values for earnings and SSI/OASDI benefits more frequently; in this case 31 percent of all persons in the CPS and 41 percent of all CPS/SER matched observations have incomes adjusted. Clearly, under both approaches the incidence of alteration is high, but because these numbers count every adjustment, no matter how small, it is possible that they do not matter much.¹² The obvious question is whether the size and distribution of these adjustments have significant effect on our perception of poverty for the elderly and for individuals and families in general.

We now have two versions of the CPS/ASEC. The first is the standard public-use sample, the basis for national poverty statistics such as those cited at the beginning of this article. The second is an adjusted data set, containing the same individuals, households, and families but with incomes adjusted using the procedures outlined above to incorporate, where available, information from administrative files. For each person we have two income figures, one computed using the restrictive adjustments and the other using the inclusive alternative. Because overall, 23.5 percent of the individuals were not matched to administrative data, the second version is an amalgam that contains many respondents for whom only survey data are available. To address this missing match problem, we have experimented with creating a third version based only on families and individuals for whom some administrative match exists.

Adjusting for Unmatched Observations

The absence of a CPS/SER match can be treated as a problem in unit nonresponse—as if failure to provide an SSN that could be matched to the SER is equivalent to refusing to cooperate with the survey at all (Lehtonen and Pahkinen 2004, 115). Adjustment of data for nonresponse then requires some specification of the circumstances that affect the likelihood of cooperation (Groves and Couper 1998). The simplest assumption is that such outcomes are a random phenomenon, and each sampling unit shares a common probability θ of responding. The response rate for the survey then provides an estimate $\hat{\theta}$ of this common probability, and population totals for various features of interest could be obtained by multiplying the analysis weights for respondents by a nonresponse adjustment factor, $1/\hat{\theta}$. However, even the simplest tabulation (as in Table 1) indicates that the match rate is not independent of demographic characteristics. Hence without adjustment, the subset of observations for which match is achieved cannot be used to make inference about the U.S. population as a whole.

We address this problem by reweighting our matched sample in a manner that reflects the varying propensity across interview units to provide SSNs or the information required for SSA to find them. Both poverty and income distribution statistics are based on families and single individuals. Given that poverty assessment requires family income for persons living in families, it would be convenient if every individual in a family had a successful SER match. In practice,

Table 5.
Incidence of SSI, OASDI, and earnings adjustment: 2002 CPS/administrative matched estimates

Adjustment category	No CPS/SER match ^a		CPS/SER match, but no CPS/DER match ^a		CPS earnings adjustments						Total	
					CPS earnings total replaced with a lesser adjusted CPS earnings total		CPS earnings total remained unchanged		CPS earnings total replaced with a greater adjusted CPS earnings total			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<i>Restrictive income adjustment</i>												
CPS combined SSI and OASDI amount replaced with lesser combined administrative SSI and OASDI amount	0	0	986	0.5	697	0	5,619	2.6	1,513	0.7	8,815	4.1
CPS combined SSI and OASDI amount remained unchanged	50,821	23.5	47,722	22.1	32,745	15.2	17,488	8.1	45,404	21.0	194,180	90.0
CPS combined SSI and OASDI amount replaced with greater combined administrative SSI and OASDI amount	0	0	3,193	1.5	950	0	6,929	3.2	1,793	0.8	12,865	6.0
Total	50,821	23.5	51,901	24.0	34,392	15.9	30,036	13.9	48,710	22.6	215,860	100.0
<i>Inclusive income adjustment</i>												
CPS combined SSI and OASDI amount replaced with lesser combined administrative SSI and OASDI amount	0	0	986	0.5	0	0	6,315	2.9	1,512	0.7	8,813	4.1
CPS combined SSI and OASDI amount remained unchanged	50,821	23.5	47,722	22.1	0	0	50,233	23.3	45,404	21.0	194,180	90.0
CPS combined SSI and OASDI amount replaced with greater combined administrative SSI and OASDI amount	0	0	3,193	1.5	0	0	7,880	3.7	1,794	0.8	12,867	6.0
Total	50,821	23.5	51,901	24.0	0	0	64,428	29.8	48,710	22.6	215,860	100.0

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

a. CPS earnings totals applied.

this is not the case. In the 2003 CPS/ASEC, nearly 66 percent of persons lived in families in which everyone was matched to the SER (“families” here include single individuals living alone or with unrelated persons), so slightly more than a third did not have a successful SER match (these are unweighted counts). However, only 14.2 percent of sample persons lived in families in which no one was matched. This presents a choice. We can focus on (a) those individuals who live in families in which someone in the family is matched, but not necessarily themselves; (b) those individuals who themselves are matched, but this is not necessarily true for all family members; or (c) those individuals who live in families in which everyone, including themselves, is matched. Unweighted sample counts for each alternative are presented in Table 6. Criterion (a) is obviously the least restrictive.

The difference between groups (a) and (b) is 20,245 persons for whom we have no SER match but who live in families with others for whom we do. About one-third are children, and 31 percent are the “reference” persons at the top of the survey register for the household. The remainder are other adults, commonly the reference person’s spouse. Given that children are unlikely to be contributing to income, and the remaining group of persons for whom we will be forced to rely on Census income is small, for our third CPS-based sample, we choose to work with group (a)—those individuals who live in families in which someone in the family is matched, but not necessarily themselves.¹³

Table 6.
Observation counts and match rates, by sample restriction criteria, 2003 CPS/ASEC

Match criterion	Count	Match rate (%)
Person observations in original CPS sample	215,860	100.0
Person observations with at least one family member with matching SER record	185,284	85.8
Person observations with self matched with SER record	165,039	76.5
Person observations with all family members matched with SER records	141,937	65.8

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

Given this subsample restriction, we next compute the parameters of a logistic regression for the log odds of being matched in this sense for each of the 215,860 persons in our sample, as shown in Table 1 (Folsom 1991; Iannacchione 1999). We estimate separate functions for persons in each of the three age groups; all three logits are reported in Appendix C. We use this function to calculate θ_i and an adjusted weight $w_i/\hat{\theta}_i$ for each individual observation.

These calculations produce a third sample made up of unrelated individuals with an SER match and persons in families with at least one member with an SER match, each with a propensity-adjusted weight and both restrictive and inclusive income estimates.

The Results: Absolute Poverty and the Prevalence of SSI Receipt

We begin by examining the consequence of these income adjustments for estimated rates of poverty using the poverty thresholds applied in Census Bureau publications. As previously noted, for 2002 a single, nonelderly adult living alone was considered poor if his or her gross cash income after transfers but before taxes for the year fell below \$9,359; for a family of four with two children, the reference amount was \$18,244 (Proctor and Dalaker 2003, 4). The standard increases with family size and varies with composition. Elderly persons living alone or with spouses are assumed to require about 10 percent less income than nonelderly persons in the same circumstance.

Prevalence of “Official” Poverty

The results are shown in Table 7—which is divided between (1) results for the total U.S. population as covered by official poverty statistics, and (2) results for SSI recipients, a subgroup of the total. For both groups we present results (a) as published by the Census Bureau, (b) based on our “intermediate” CPS data that include income adjustments for persons for whom an SER match was obtained, and (c) for our “final” reweighted matched sample that is restricted to persons living in families with at least one SER match. Within each estimate group, we present results for children ages 0–17, for adults aged 18–64, and for adults aged 65 or older.

Tabulations 1(a) and 2(a) are based on the same CPS data ($n = 215,860$) used by the Census Bureau to generate official poverty estimates. (Our estimates differ very slightly from figures published by the Census Bureau

because it uses data without top codes, and we use the public-use sample, which is top-coded.) The official measures appear for reference at the top of the columns for both the restrictive and inclusive computations. We are particularly interested in poverty rates for the elderly and among SSI recipients. In the national data, the poverty rates for working-age and elderly populations are 10.6 percent and 10.4 percent, respectively. As anticipated, poverty rates for persons in all age groups that are identified as SSI recipients are much higher than rates estimated for the age groups as a whole.

Tabulations 1(b) and 2(b) report the results of applying only our restrictive and inclusive income-adjustment protocols. The entire CPS sample is retained (n = 215,860), and CPS data are used for all persons for whom a CPS/SER match was not achieved, so the total sample size does not change from that recorded for the CPS. Looking first at the data for all persons, the effect of incorporating administrative data is sensitive to the assumption set. The restrictive adjustment decreases the estimated aggregate poverty rate from 12.1 percent to 11.8 percent; the estimated

Table 7.
Poverty rates across age and SSI recipient groups, 2002: Before and after income adjustment using administrative data

Age group	Estimated population	Restrictive		Inclusive		Number of person records
		Number living below poverty ^a	Percent living below poverty	Number living below poverty	Percent living below poverty	
1(a): U.S. population; estimates based on unadjusted CPS income data^b						
0–17	72,695,775	12,127,725	16.7	12,127,725	16.7	66,016
18–64	178,387,747	18,859,737	10.6	18,859,737	10.6	129,460
65 or older	34,233,824	3,576,169	10.4	3,576,169	10.4	20,384
Total	285,317,346	34,563,631	12.1	34,563,631	12.1	215,860
1(b): U.S. population; estimates based on adjusted CPS income data^c						
0–17	72,695,775	11,942,960	16.4	9,684,218	13.3	66,016
18–64	178,387,747	18,702,806	10.5	15,030,345	8.4	129,460
65 or older	34,233,824	3,111,542	9.1	3,043,279	8.9	20,384
Total	285,317,346	33,757,308	11.8	27,757,842	9.7	215,860
1(c): U.S. population with income adjustment, sample restriction, and reweighting^d						
0–17	72,451,591	11,832,495	16.3	9,453,838	13.0	62,682
18–64	172,660,884	18,192,264	10.5	13,616,602	7.9	108,038
65 or older	33,001,207	2,768,217	8.4	2,677,064	8.1	14,564
Total	278,113,682	32,792,976	11.8	25,747,504	9.3	185,284
2(a): SSI recipient population; estimates based on unadjusted CPS income data^e						
0–17	364,804	132,151	36.2	132,151	36.2	323
18–64	3,595,948	1,577,196	43.9	1,577,196	43.9	2,534
65 or older	1,192,268	572,868	48.0	572,868	48.0	778
Total	5,153,020	2,282,215	44.3	2,282,215	44.3	3,635
2(b): SSI recipient population; estimates based on adjusted CPS income data^f						
0–17	830,116	219,764	26.5	181,242	21.8	696
18–64	3,809,850	1,609,734	42.3	1,557,189	40.9	2,604
65 or older	1,695,088	688,697	40.6	668,344	39.4	1,081
Total	6,335,054	2,518,195	39.8	2,406,775	38.0	4,381

(Continued)

Table 7.
Poverty rates across age and SSI recipient groups, 2002: Before and after income adjustment using administrative data—Continued

Age group	Estimated population	Restrictive		Inclusive		Number of person records
		Number living below poverty ^a	Percent living below poverty	Number living below poverty	Percent living below poverty	
2(c): SSI recipient population with income adjustment, sample restriction, and reweighting^g						
0–17	862,176	228,729	26.5	187,873	21.8	680
18–64	3,880,146	1,729,553	44.6	1,666,596	43.0	2,121
65 or older	1,956,997	781,043	39.9	754,997	38.6	906
Total	6,699,319	2,739,325	40.9	2,609,466	39.0	3,707

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

- a. Persons are identified as "poor" if their CPS total family unadjusted income record is less than their corresponding CPS family poverty threshold record. Family income records may include top-coded components. These totals differ slightly from official reports, which are based on actual reported income without top-coding.
- b. Figures have been generated from the entire 2003 CPS/ASEC sample of 215,860 persons used by the Census Bureau to estimate official poverty rates. Income and weight records are unadjusted.
- c. Income adjustments were made using administrative data on earnings, OASDI, and SSI receipt, following decision rules presented in the text. CPS weights are unadjusted.
- d. Estimates were derived from a reduced 2003 CPS/ASEC poverty sample of 185,284 persons who had at least one family member with matching CPS/SER records. Figures are based on the adjustment of CPS income records using administrative data, following "sample restriction" decision rules presented in the text. Weights have been adjusted by propensity estimates derived from a regression model involving person-level records (based on CPS/SER family); see the text and Appendix B.
- e. Persons are identified as SSI recipients if they have a positive CPS SSI record. Income and weight records are unadjusted.
- f. Income adjustments were made using administrative data on earnings, OASDI, and SSI receipt, following decision rules presented in the text. SSI status is based on adjusted data. Weights are unadjusted.
- g. Estimates were derived from a reduced 2003 CPS/ASEC poverty sample of 185,284 persons who had at least one family member with matching CPS/SER records. Figures are based on the adjustment of CPS income records using administrative data, following "sample restriction" decision rules presented in the text. Weights have been adjusted by propensity estimates derived from a regression model involving person-level records (based on CPS/SER family); see the text and Appendix B. Persons are identified as SSI recipients if they have a positive SSR SSI record.

rates for all three groups decline, with the greatest change for the elderly. The inclusive adjustment produces a much larger reduction in poverty rates for all groups, most notably for the nonelderly. Both adjustments produce lower SSI poverty rates. The effect is most dramatic for persons aged 17 or younger. Under the restrictive procedure, the poverty rate for the elderly is 40.6 percent, over 7 percentage-points lower than the CPS estimate. Using our inclusive income adjustment procedure, the estimate is 39.4 percent, 8.6 percentage-points lower than the CPS estimate. The unweighted SSI recipient count (the number of "person records" in the last column of the table) goes up by over a fifth, from 3,635 to 4,381 when administrative data are employed. This is another manifestation of underreporting of SSI in the CPS.

Tabulations 1(c) and 2(c) illustrate the results of applying our adjustment conventions, restricting the

sample to persons living in families with at least one member with matching individual CPS and SER records ($n = 185,284$) and reweighting the observations using propensity scores. Appendix C reports the parameter estimates for the logistic functions used to reweight the CPS person weights of the noted 185,284 member restricted person sample. The aggregate outcome (in 1(c)) is a modest additional decrease in estimated aggregate poverty rates under the restrictive convention when compared with estimates based only on adjusting data for respondents who could be matched to SSA records. When the inclusive procedure is employed, the outcome is similar—estimated poverty rates decline further. For SSI recipients, the effect is a bit more varied, with child and nonelderly adult SSI poverty estimates slightly higher and elderly rates slightly lower than those estimated without sample restriction and reweighting.

What drives the difference between the restrictive and inclusive estimates? A review of the details in Appendix A indicates that the most significant difference between the two alternative calculations is that for earnings and self-employment income, the restrictive calculations rely on the DER, that is, earnings reported by employers. The inclusive alternative takes CPS reports when the amounts reported in the survey exceed what appears in administrative data. Because the inclusive procedure generally follows a “greater of DER and CPS” rule, the amounts there will be larger; the results indicate the difference is quite significant. For the elderly, earnings are less important (although they count because poverty is estimated on the basis of total family income, not just the income of the elderly themselves). What makes the difference is correction for SSI underreporting. Aside from imputations for state-administered SSI supplements, the same correction is applied in both the restrictive and inclusive procedures because SSA knows what people receive and the consequence in both cases is an 8–9 percentage-point reduction in estimated poverty, particularly among SSI elderly recipients.

SSI Population Estimates

In “The Merge” section of this article, we established the CPS undercount of SSI recipients by looking at the actual prevalence of SSI receipt for adults (aged 18 or older) in CPS households who were successfully matched with administrative data and comparing this number to what was actually reported to Census Bureau interviewers (see Table 4). The CPS is designed to provide estimates of the total numbers of households, families, and persons with various attributes. Thus the undercount could also be investigated by comparing the number of SSI recipients estimated from the CPS sample with total recipients recorded by SSA. This could presumably be done with both the original and the adjusted CPS data.

But just what is meant by “total recipients” poses yet another problem. Normally caseload data are reported for a point in time. For example, SSA regularly publishes case counts by age group in December (see, for example, SSA (2007), Table 3). However, the CPS/ASEC asks for SSI payments received in the preceding year. Thus, in principle the SSI recipient count derived from the 2003 CPS/ASEC is an estimate of the total number of people who received SSI at any time during calendar 2002. This “ever-on” number should be larger than the largest monthly caseload during the year.

There are nuances. Persons who receive SSI in 2003 but die before experiencing the CPS interview are uncounted. Age in the CPS is reported as of the time of the interview, so age categorization only approximates what would be obtained by considering, for example, age at some point in 2002. Any comparison between caseload projection from the CPS and administrative data should also be adjusted for the fact that the SSI caseload includes persons living in institutions who are not included in the CPS.

Despite these complications, it is important to gauge CPS coverage by estimating just how many SSI recipients should have been captured by the survey. To do this, we use a 1 percent sample of monthly SSR SSI recipient records to count the number of persons who received SSI at any time during calendar 2002, and we compare these counts with the recipient population estimated from the various CPS samples we used during our study.¹⁴ The results by age group appear in Table 8. Columns 1, 2, and 3 show the SSI population estimates generated from our “baseline,” “intermediate,” and “final” CPS samples, respectively. More specifically, the first column of data (our baseline estimates) are straight from the CPS and indicate the sum of sample weights for persons for whom the unadjusted 2003 CPS/ASEC reports receipt of SSI in 2002. The second column shows intermediate estimates generated from the same CPS sample used for official poverty estimates, but matched to administrative sources and involving adjustment to only CPS income records. The third column gives our final estimates of the number of recipients calculated on the basis of our restricted CPS/administrative-matched sample with CPS income and weight adjustments.

Administrative counts are given in columns 4 and 5. Column 4 notes the average monthly SSI caseload for 2002. Column 5 shows our 1 percent SSR sample estimate of the number of persons, in the “universe” sampled by the CPS, who had income from SSI in 2002. That column also shows our “target count” because it indicates SSA’s record of the number of persons, by age category, on March 15, 2003 (roughly the midpoint of the CPS/ASEC field interviews), who should have reported receiving SSI at some time in 2002. Estimates in column 5 exclude (obviously) persons deceased by March 15 and persons who were, in December 2002, residents in Medicaid institutions. The estimate is 1–2 percentage-points higher than the estimate indicated by the CPS because it includes homeless persons. The only estimate we have found for the point-in-time prevalence of

Table 8.
Estimated SSI population compared with administrative count (with Medicaid institution adjustment), 2002

Age group (at time of 2003 CPS/ASEC)	Total 2002 SSI recipients estimated from identified CPS samples			Average monthly recipient caseload in 2002 from administrative data	Total 2002 SSI recipients in 2003 CPS/ASEC universe, estimated from administrative data ^a	Ratio, CPS restricted/reweighted sample population estimate to administrative recipient count
	2003 CPS/ASEC	CPS/ASEC using adjusted income data	CPS/ASEC using restricted/reweighted sample and adjusted income data			
	(1)	(2)	(3)	(4)	(5)	(6)
0–17	364,804	830,116	862,176	897,771	1,024,500	0.842
18–64	3,595,948	3,809,850	3,880,146	3,862,587	4,308,000	0.901
65 or older	1,192,268	1,695,088	1,956,997	1,998,249	2,064,200	0.948
Total	5,153,020	6,335,054	6,699,319	6,758,608	7,396,700	0.906

SOURCE: Authors' calculations using 2003 CPS/ASEC data and the Social Security 1 percent SSR beneficiary sample. CPS income reports are adjusted using administrative data. See the text.

a. See the text and Table 6. This is the estimated number of persons ever receiving SSI in 2002 who were alive and in the indicated age group at the time of the 2003 CPS/ASEC survey. This estimate is reduced by the number of persons in communal facilities or by those who are homeless.

homelessness among SSI recipients is 55,000–70,000 in 2002, or about 1.1 percent of the average monthly adult caseload in that year.¹⁵ (Child SSI recipients are unlikely to be homeless.) Note that our estimate of recipients “ever on” during the year and alive for the CPS interview exceeds the average monthly caseload by almost 10 percent.

Administrative Data Help

In Table 8, the ratio of columns 1 and 5 values (not shown) reflect the incidence of CPS SSI underreporting before adjustment. The overall CPS SSI underreporting rate, before adjustment, was 30 percent, and the underreporting rates for children, the working-aged, and elderly recipients were 64 percent, 17 percent, and 42 percent, respectively. Even with the allowance for exclusion of the homeless from the CPS, it is clear that without incorporation of administrative data, the CPS is not a reliable source of SSI child and adult recipient counts.

The last column in Table 8 gives the ratio of our CPS-based “best estimates” of our final SSI recipient estimate (column 3) compared with the total derived from administrative data (column 5). These figures reveal the effectiveness of our CPS income and weight adjustments and indicate that our CPS adjustments reduced the overall CPS SSI underreporting rate from 30 percent to 9 percent. For the elderly, these adjustments reduced their CPS SSI underreporting rate from

42 percent to 5 percent. Our final SSI estimates are not equal to the “target counts” estimated from the 1 percent SSR sample, but are closer than the expected number of SSI recipients captured by our baseline or intermediate samples. The low CPS SSI underreporting rates associated with our final sample reaffirms the use of our CPS income and weight adjustments.

Five conclusions are drawn from our analysis to this point:

1. More thought needs to be given to the advisability of and procedures for integrating administrative and survey data. The disparity between administrative and survey reports and the apparent correlation of this disparity with income levels presents serious difficulties.
2. We think truth lies somewhere between our restrictive and inclusive estimates. Because both procedures produce lower estimated poverty estimates, the implication is that income is underreported in the CPS, with the consequence that official poverty rates are exaggerated.
3. SSI receipt is underreported in the CPS—most substantially for children, and least for working-age adults.
4. Adjustment with administrative data reduces estimated elderly poverty rates. More specifically, our final estimates suggest that from 38.6–39.9 percent of elderly SSI recipients were poor in 2002.

5. Judged on the basis of comparing sample-based recipient counts to administrative data, the propensity-adjusted CPS sample offers a more reliable basis for inference about the prevalence of SSI receipt than either the CPS alone or the CPS partially adjusted with administrative income data.

Relative Poverty

In recent years the Census Bureau (2007) has conducted extensive studies on what effect alternative poverty standards and measures of resources have on poverty assessment. In general this work, while acknowledging the problem of underreporting, does not incorporate adjustments for it (Weinberg 2005). Our study utilizes only what the Census Bureau terms “money income.” More refined measures subtract taxes, add capital gains and estimates of the value of various benefits, include food stamps and rent subsidies, and include in the most ambitious “disposable income” measure—imputed rental income for homeowners (Census Bureau 2007, 2). The effect on the estimated poverty rate of refining the income measure is similar in magnitude to the effect we discover for adjusting for underreporting. In 2002, use of the most inclusive measure of income drops the estimated aggregate poverty rates from 12.1 percent to 9.3 percent if imputed rental income of homeowners is not included and 8.6 percent if it is (Dalaker 2005, 7). As might be anticipated, the effect of considering homeownership is greatest for the elderly. These adjustments require a number of imputations that cannot be replicated without detailed information on Census Bureau procedures. This matter is addressed in our concluding remarks.

It is common internationally to assess poverty not on the basis of an absolute benchmark like the official U.S. measure, but in relation to the distribution of income within society. In this section, we consider the consequences of the CPS adjustments we have introduced for inferences about the distribution of income and the position of SSI recipients within it.

The Equivalence Scale

To investigate the poverty status of SSI recipients across a variety of family types, we must have an equivalence scale that makes explicit our assumption about the amount of income that makes the standard of living for a person in one family size (for example, a person living alone) equal to that of a person in a

family differently composed (for example, two adults and a child). For these calculations we follow the precedent of the Census Bureau’s alternative poverty estimates (Dalaker 2005; Census Bureau 2007) and adopt the three-parameter equivalence scale suggested by a recent National Research Council (NRC) review of recommendations for poverty standard reform (Iceland 2005). This is the same scale used by Koenig and Rupp (2004) in their analysis of the sensitivity of estimated poverty rates for SSI recipients to alternative ways of measuring poverty.

Under the three-parameter equivalence scale, to achieve an equivalent standard of living, for every \$1 of income for a single individual, a childless couple would require \$1.41; single-parent families would need $\$(A + \alpha + P * (C-1))^F$; and all other families would require $\$(A + P * C)^F$, where A is the number of adults in a family and C is the number of children. Following the NRC’s poverty reform recommendations and the Census Bureau, we assume that $\alpha = 0.8$, $P = 0.5$, and $F = 0.7$. The parameter P indicates how children are to be weighted relative to adults: $P = 5$ means that each child beyond the first one requires half the income needed for adults. The parameter α allows the first child in a single-parent family to be weighted differently from others. F reflects economies of scale; a value of 1.0 would mean that expenses go up proportionately with effective size. The assumed value of 0.7 indicates that a doubling (100 percent) increase in effective family size would increase the cost of sustaining a given standard of living by 70 percent. Inserting the appropriate numbers for a single parent with two children produces an equivalence adjustment of $\$(1 + 0.8 + 0.5)^7 = \1.79 . For every \$1 of income for a single individual, achieving an equivalent standard of living for a single adult with two children would require using the NRC equivalence scale—\$1.79.

For the differential between single adults and childless couples, this scale follows the “square root” convention that living costs go up with the square root of family size, which is common in European analysis of income distribution (Förster and Mira d’Ercole 2005). We shall term this four-part system the NRC equivalence scale. Note that unlike the official poverty standard, the NRC scale does not differentiate among families on the basis of age. Also, like the official standard, the NRC scale is not affected by the presence of disabilities (as is the case for all nonelderly SSI recipients), even when offsetting the consequences of a disability is expensive (Zaidi and Burchardt 2005).

The Results

Income distribution estimates are presented in Table 9. Again, we present three versions based on our baseline, intermediate, and final CPS-related data sets previously discussed and labeled (a), (b), and (c) in Table 7. In Table 9, we do this in the first panel under the restrictive income adjustment procedure and in the second panel for the higher inclusive alternative. For each set, the line marked “upper bound” shows the income level that demarks the percentile of the income distribution identified by the column header. Thus for the unadjusted CPS data (a), median personal income is \$25,712. In the column adjacent to the top decile of the distribution, we report half the median and the proportion of the population with incomes (adjusted for family composition using the NRC equivalence scale) less than half this amount. Thus unadjusted CPS data for 2002 indicate that 22 percent of the population would have been counted as poor because their incomes fell below half the equivalence-adjusted median, one of the standards typically applied in Europe.¹⁶

For each of the samples, we also report where the elderly as a whole and elderly SSI recipients are on the equivalence scale. Again referring to sample (a) where ($n = 215,860$), the unadjusted CPS data indicate that 27.5 percent of the elderly had incomes below half the median, and over three-quarters of elderly SSI recipients were at the same level. At the same time, some elderly persons receiving SSI appear relatively well off: 8.3 percent of elderly SSI recipients have incomes above the median. This outcome occurs because these recipients live in families with substantial income from other sources. The annual equivalent of the 2002 single-person FBR was \$6,540, well below the half-the-median relative poverty threshold of \$12,856. Indeed, separate tabulations indicate that only 8.2 percent of all persons (regardless of SSI status) included in the 2003 CPS/ASEC had equivalence-adjusted incomes less than the annualized single-person FBR amount.

Tabulations in both the (b) and (c) panels of Table 9 show what occurs when the CPS data are adjusted. Our discussion concentrates on comparison of outcomes before adjustment—tabulation (a)—to outcomes using the income-adjusted, restricted, and reweighted sample, (c). It should be noted first that the restrictive and inclusive income-adjustment procedures have substantially different implications for the location and shape of the income distribution. Under the restrictive adjustment, median equivalent income changes very little, falling less than a percent, from \$25,712 to \$25,527. The inclusive adjustment produces

a substantial upward shift, raising the estimated median by almost 12 percent, from \$25,712 to \$28,718. Every other decile cutoff increases as well. Second, under both adjustment protocols there is little difference between estimates based on the entire CPS with income adjustment—sample (b) where ($n = 215,860$)—and values calculated using the restricted sample (c) where ($n = 185,284$). Indeed, for all three CPS versions the estimated relative poverty rate for all persons is similar, 21–22 percent. The adjusted samples produce a reduced, but still very high, relative poverty rate for elderly SSI recipients; here, too, there is little difference between estimates made under restrictive and inclusive adjustment assumptions. Using sample (c) places the FBR even further down the income distribution. By our calculation, in 2002, the restrictive income-adjusted data indicate that only 7.7 percent of persons had equivalence-adjusted incomes less than the annualized FBR. The corresponding figure for the inclusive income adjustment is just 5.7 percent.

The restrictive and inclusive income-adjustment procedures differ in their consequences for the estimated dispersion of income. One common measure of dispersion, or inequality, of income is the ratio of the 90th to the 10th decile cutoff (see Burkhauser, Feng, and Jenkins (2007) for a critical discussion). Without adjustment, the 90/10 ratio calculated from the unadjusted sample is 8.68. The same ratio calculated using sample (c) is 8.70 using the restrictive income adjustment and 8.19 using the inclusive alternative.

Comparison of results by decile of the income distribution in Table 9 provides additional perspective on the absolute poverty rates reported in Table 7. In Table 6, the restrictive/inclusive adjusted estimate of the poverty rate for all persons is 9.3–11.8 percent. For the elderly the range is 8.1–8.4 percent, and for elderly SSI recipients the range is 38.6–39.9 percent. For the elderly these rates compare closely with the poverty rates in Table 8 if instead of considering half the median we take the 10th decile of the overall income distribution as the standard. Under this stringent definition, the restrictive/inclusive range for the elderly poverty rate is 6.8–10.0 percent, and the poverty rate range for elderly SSI recipients is 35.2–46.7 percent. Recall that the official 2002 poverty standard for elderly persons living alone was \$8,628, falling between the first decile cutoff under restrictive (\$7,624) and inclusive (\$9,000) adjustment procedures. Thus in 2002 the official poverty standard was roughly equivalent in terms of estimated poverty prevalence to what would have been obtained had a relative standard

Table 9.
The effect of merging CPS and administrative data on the estimated national income distribution, 2002

General income distribution	Percentiles									Number of person records
	10	20	40	50	60	80	90	Top decile	50 percent of the median	
Restrictive 2002 CPS/administrative matched data set—										
<i>(a): using unadjusted income percentiles for all people and the NRC equivalence scale (unadjusted weights) ^a</i>										
Upper bound (\$)	7,462	12,000	20,862	25,712	31,350	47,696	64,793	...	12,856	215,860
Distribution (%)										
All people	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	22.0	215,860
Elderly ^b	7.8	16.1	29.1	11.9	9.2	13.3	6.0	6.7	27.5	20,384
Elderly SSI ^c	32.9	39.0	14.8	5.0	3.6	2.9	1.0	0.8	75.1	778
<i>(b): using adjusted income percentiles for all people and the NRC equivalence scale (unadjusted weights) ^d</i>										
Upper bound (\$)	7,579	12,134	20,856	25,662	31,284	48,302	66,451	...	12,831	215,860
Distribution (%)										
All people	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	21.7	215,860
Elderly	7.2	15.2	29.1	12.2	9.7	14.1	6.1	6.4	25.2	20,384
Elderly SSI ^e	35.4	33.4	12.4	5.6	5.0	5.7	1.2	1.4	70.0	1,081
<i>(c): using adjusted income percentiles for all people and the NRC equivalence scale (adjusted weights) ^f</i>										
Upper bound (\$)	7,624	12,109	20,726	25,527	31,086	47,903	66,343	...	12,764	185,284
Distribution (%)										
All people	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	21.6	185,284
Elderly ^b	6.8	14.9	28.5	12.2	10.0	14.9	6.4	6.4	24.0	14,564
Elderly SSI ^c	35.2	34.2	11.5	5.8	4.8	5.7	1.4	1.5	70.7	906
Inclusive 2002 CPS/administrative matched data set—										
<i>(a): using unadjusted income percentiles for all people and the NRC equivalence scale (unadjusted weights) ^a</i>										
Upper bound (\$)	7,462	12,000	20,862	25,712	31,350	47,696	64,793	...	12,856	215,860
Distribution (%)										
All people	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	22.0	215,860
Elderly ^b	7.8	16.1	29.1	11.9	9.2	13.3	6.0	6.7	27.5	20,384
Elderly SSI ^c	32.9	39.0	14.8	5.0	3.6	2.9	1.0	0.8	75.1	778
<i>(b): using adjusted income percentiles for all people and the NRC equivalence scale (unadjusted weights) ^d</i>										
Upper bound (\$)	8,708	13,585	23,095	28,325	34,441	52,321	72,435	...	14,163	215,860
Distribution (%)										
All people	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	21.3	215,860
Elderly	10.1	17.6	28.7	10.8	8.5	12.7	5.8	5.8	29.6	20,384
Elderly SSI ^e	42.3	27.4	13.2	4.2	5.1	5.1	1.4	1.4	70.7	1,081
<i>(c): using adjusted income percentiles for all people and the NRC equivalence scale (adjusted weights) ^f</i>										
Upper bound (\$)	9,000	13,896	23,444	28,718	34,843	52,919	73,743	...	14,359	185,284
Distribution (%)										
All people	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	21.0	185,284
Elderly ^b	10.0	17.3	28.3	10.7	8.6	13.2	5.9	5.9	29.0	14,564
Elderly SSI ^c	46.7	23.9	12.4	3.7	5.2	5.3	1.5	1.4	71.7	906

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

NOTES: ... = not applicable.

- a. Figures involve unadjusted CPS income data and weights, as well as the entire 2003 CPS/ASEC poverty sample of 215,860 persons.
- b. Persons with a CPS-reported age of 65 years or older.
- c. Persons with a positive CPS SSI record.
- d. Estimates are based on adjusted CPS income records, unadjusted weights, and involve the entire 2003 CPS/ASEC sample used to generate official poverty estimates.
- e. Persons are identified as SSI recipients if either they have no matching CPS/SER records and a positive CPS SSI record, or matching CPS/SER records and a positive SSR SSI record.
- f. Figures involve adjusted CPS income data (with "sample restriction" decision rules) and weights, and a 2003 CPS/ASEC poverty sample limited to those observations with at least one family member with matching CPS/SER records.

been used and set at the tenth decile. Whether the composition of the population identified as poor under the two approaches would be similar is a matter for additional research.

Table 9 compares the elderly as a whole and elderly SSI recipients with the national income distribution. For some purposes it may be more useful to compare elderly SSI recipients with the entire elderly population from which the former are a subset of. Table 10 places elderly SSI recipients in context of the income distribution of all elderly persons (with and without SSI payments), using the alternative merge assumptions. In this case, both the restrictive and inclusive adjustment procedures shift the estimated income distribution to the right, raising estimated median income among all elderly persons by 4.8 percent under the restrictive adjustment and 7.9 percent under the inclusive adjustment. (Here again we concentrate on the restricted and reweighted subsample.) Between 46.3 percent and 46.6 percent of elderly SSI recipients have incomes in the lowest decile of the elderly income distribution; nearly 70 percent fall in the lower 20 percent of the distribution. At the same time, under both adjustment rules we estimate that approximately 19 percent of elderly SSI recipients have equivalence-adjusted incomes that exceed the median income calculated for the entire elderly population.

Summary

When poverty is assessed using a relative standard of less than half the median, the prevalence of poverty is estimated to be much greater than when the official standard is employed, and poverty among the elderly exceeds the rate for all other persons. Adjusting the CPS data using information from administrative files leads to generally greater income, but little change in relative status. Considered in either relative or absolute terms, the prevalence of poverty among elderly SSI recipients is high, and the FBR is inadequate by itself to raise income above the poverty standard. Here as with the absolute poverty standard, the outcome is sensitive to the merging procedure employed.

Conclusions

This article explores the effect of merging CPS and SSA administrative data on perception of poverty among the elderly in general and SSI recipients in particular. The findings are as follows:

- The CPS substantially understates the prevalence of SSI receipt in the population.

- For the entire national population, adjustment of CPS weights and reported income using administrative data significantly reduces estimated rates of absolute poverty (using the official U.S. poverty standard), but has a smaller influence on relative poverty rates. In contrast, CPS adjustments have a sizable impact on the poverty rates of elderly SSI recipients, whether they are evaluated by an absolute or relative standard.
- Without adjustment, CPS data modestly exaggerate income inequality.
- Use of a relative poverty standard leads to perception of greater prevalence of poverty both overall and among the elderly.
- Elderly SSI recipients are very poor. Nearly 70 percent fall in the bottom fifth of the national income distribution, and about the same proportion fall in the bottom fifth of the income distribution among all elderly persons. Although correction for SSI underreporting reduces the official poverty rate for elderly SSI recipients, the revised absolute rate is still 38–40 percent when all SSI (and OASDI) benefits are included as income.

There are many opportunities for additional research. It is important to replicate this analysis for subsequent years. Among other things, replication would support the study of the effect of using administrative data on the perception of poverty at one versus numerous points in time. We need to assess the sensitivity of our results to alternative treatment of CPS response and variations in procedures for addressing unmatched observations. We have provided only point estimates and have slated testing for statistical precision for another time because of the challenges raised by reweighting and uncertainty about how to adjust such estimates for the effects of our merging strategy. Like official poverty measurement, our income measure does not include income from the Food Stamp Program or the Earned Income Tax Credit program despite these programs being among the largest of their kind in the United States (Trenkamp and Wiseman 2007). It is important to gauge the effect of such programs on poverty and the income distribution. Our analysis reveals that the CPS substantially underreports SSI receipt, and similar underreporting problems are known to arise for food stamp receipt (Meyer and Sullivan 2007). It would be advantageous to experiment with the incorporation of administrative data into the Census Bureau's "alternative poverty measures" analyses.

Table 10.
The effect of merging CPS and administrative data on the estimated income distribution of the elderly, 2002

Income distribution of the elderly ^a	Percentiles								Number of person records	
	10	20	40	50	60	80	90	Top decile		50 percent of the median
Restrictive 2002 CPS/administrative matched data set—										
<i>(a): using unadjusted income percentiles for the elderly and the NRC equivalence scale (unadjusted weights) ^b</i>										
Upper bound (\$)	8,162	11,013	16,375	19,736	23,522	36,844	53,070	...	9,868	20,384
Distribution (%)										
All elderly	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	15.8	20,384
Elderly SSI ^c	47.7	18.4	15.8	3.6	4.6	6.5	2.0	1.5	61.3	778
<i>(b): using adjusted income percentiles for the elderly and the NRC equivalence scale (unadjusted weights) ^d</i>										
Upper bound (\$)	8,604	11,448	16,962	20,248	24,006	37,027	53,747	...	10,124	20,384
Distribution (%)										
All elderly	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	14.9	20,384
Elderly SSI ^e	42.8	24.1	10.7	3.3	4.8	8.8	3.2	2.3	58.9	1,081
<i>(c): using adjusted income percentiles for the elderly and the NRC equivalence scale (adjusted weights) ^f</i>										
Upper bound (\$)	8,868	11,669	17,318	20,690	24,472	37,508	54,300	...	10,345	14,564
Distribution (%)										
All elderly	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	15.0	14,564
Elderly SSI ^e	46.3	22.1	9.3	3.1	4.9	8.9	3.2	2.2	61.2	906
Inclusive 2002 CPS/administrative matched data set—										
<i>(a): using unadjusted income percentiles for the elderly and the NRC equivalence scale (unadjusted weights) ^b</i>										
Upper bound (\$)	8,162	11,013	16,375	19,736	23,522	36,844	53,070	...	9,868	20,384
Distribution (%)										
All elderly	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	15.8	20,384
Elderly SSI ^c	47.7	18.4	15.8	3.6	4.6	6.5	2.0	1.5	61.3	778
<i>(b): using adjusted income percentiles for the elderly and the NRC equivalence scale (unadjusted weights) ^d</i>										
Upper bound (\$)	8,687	11,557	17,256	20,749	24,633	38,589	56,083	...	15,675	20,384
Distribution (%)										
All elderly	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	15.6	20,384
Elderly SSI ^e	42.1	23.5	11.4	3.1	4.3	9.4	4.2	2.1	59.1	1,081
<i>(c): using adjusted income percentiles for the elderly and the NRC equivalence scale (adjusted weights) ^f</i>										
Upper bound (\$)	8,988	11,856	17,763	21,298	25,438	39,860	57,294	...	10,649	14,564
Distribution (%)										
All elderly	10.0	10.0	20.0	10.0	10.0	20.0	10.0	10.0	15.5	14,564
Elderly SSI ^e	46.6	20.4	10.4	3.3	4.0	9.7	3.5	2.2	60.5	906

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

NOTES: ... = not applicable.

- a. Persons with a CPS-reported age of 65 years or older.
- b. Figures involve unadjusted CPS income data and weights, as well as the entire 2003 CPS/ASEC poverty sample of 215,860 persons.
- c. Persons with a positive CPS SSI record.
- d. Estimates are based on adjusted CPS income records, unadjusted weights, and involve the entire 2003 CPS/ASEC sample used to generate official poverty estimates.
- e. Persons are identified as SSI recipients if either they have no matching CPS/SER records and a positive CPS SSI record, or matching CPS/SER records and a positive SSR SSI record.
- f. Figures involve adjusted CPS income data (with "sample restriction" decision rules) and weights, and a 2003 CPS/ASEC poverty sample limited to those observations with at least one family member with matching CPS/SER records.

Appendix A: Data Merge Procedure

The sources used for the CPS/administrative data-matching process are identified by acronym as indicated and detailed in Box 1 below. For convenience, these acronyms are used both to refer to a source itself and, in places, to the value of payments recorded in the source. Hence “DER=0” indicates that the value of the DER for some person in the merged data set is zero.

The protocol for merging the 2003 CPS/ASEC and administrative data is summarized in Table A-1 on the following page.

Box 1. Sources employed in CPS/administrative data match	
CPS/ASEC	Current Population Survey/Annual Social and Economic Supplement, 2003. Captures wage and salary earnings for calendar year 2002 as well as self-employment income (SEI)—(including losses)—derived from farm and nonfarm activities.
SER	Summary Earnings Record. “SER match” indicates that the CPS individual has been matched to SSA’s master database. The SER includes all earnings (including positive SEI) subject to FICA taxation, and thus the value is capped at the FICA contribution maximum. The SER does not capture SEI losses.
DER	Detailed Earnings Record. Summary of earnings reports from all employers and SEI received by SSA. Earnings totals are not capped at FICA contribution maximums and include earnings from employment not covered by OASDI, but subject to Medicare taxation. The tabulation includes separate information for wage and salary receipts, SEI (if positive), and deferred income.
SSR	Supplemental Security Record. Administrative record of SSI payments.
PHUS	Payment History Update System. Administrative record of OASDI benefit amounts.

Appendix B: State SSI Supplements

As shown in Table B-1, all but one of the 51 states (including the District of Columbia) supplemented the federal SSI payment in 2002 for at least some individuals (SSA 2004, 7). In a very few cases, these payments are required by federal law to sustain benefits for persons receiving state benefits at the time (1974). SSI replaced the federal/state programs—Old-Age Assistance and Aid to the Blind—instituted by the Social Security Act of 1935. The remaining “optional”¹⁷ supplements serve a variety of purposes, from general income support to provision for special needs. Some state supplements are administered by SSA; in other cases the supplements are administered by states. When the supplements are administered by SSA, states pay both for the benefit itself and a per-payment charge levied by SSA to cover its costs.

The state supplements pose two problems for this analysis. First, in many instances the provision is not universal and compensates for some special need. Information on receipt of such payments or the benefits they support is not readily available. Second, if state-administered, such benefits do not appear in the SSR, yet it is likely that if reported at all they are reported as SSI in response to CPS interviewers. Thus in comparing SSA administrative data with CPS reports for states with state-administered supplements, it is essential to recognize that CPS reports may exceed amounts known to SSA because of the supplements. Moreover, it is possible for persons to retain eligibility for a state supplement even when income is too high for federal benefit receipt.

In this article, the state supplements are addressed in the following way. First, for individuals without an SER match, we assume state supplements are included in what is identified in the sum of SSI and OASDI income. (As discussed in the text, we work with the sum of SSI and OASDI to allow for misidentification of the source of benefits.) For individuals with an SER match, we concentrate on “universal” supplements, which we define as additions to cash benefits unrelated to special needs. We ignore supplements that are paid for special needs and unavailable to SSI recipients generally. Second, we differentiate between universal state supplements administered by SSA and those administered by states. Federally administered payments are recorded in the SSR

Table A-1.
Protocol for merging CPS and administrative data

Number of observations ^a	Administrative match status	CPS (baseline) record content	Income adjustment	
			Restrictive	Inclusive
Earnings: Wage, salary, and self-employment income				
...	...	...	<i>Summary:</i> When a CPS/SER match and a positive DER earnings total exist, we accept the DER total. ^b If a DER record is not available, we use CPS values.	<i>Summary:</i> When a CPS/SER match and a positive SER earnings record exist, we generally accept the greater of the DER, SER, or CPS earnings totals. ^b If a SER record is not available, we use CPS values.
50,821	No SER match.	...	Accept the CPS earnings total.	Same. ^c
81,638	With SER match, no DER match, or DER earnings = 0.	CPS imputed and nonimputed earnings records.	Accept the CPS earnings total.	Same. ^c
83,401	With DER match; positive DER earnings total.	CPS imputed or nonimputed earnings records.	If the CPS/SEI record is negative and not imputed, set the adjusted earnings record to the DER earnings total plus the CPS/SEI value. Otherwise, set adjusted earnings record to the DER value.	Apply the greater of (1) the earnings value assigned under the "restrictive" procedure or (2) the CPS earnings total.
OASDI/SSI: Income from OASDI and SSI^a				
...	...	d	Use administrative data, when available.	Differs from the restrictive adjustment only in states with SSI supplement.
50,821	No SER match	...	Accept the CPS SSI/OASDI total.	Same. ^c
67,745	SER match in state with universal federally administered state SSI supplement.	...	Accept the sum of the SSR and PHUS amounts for the sum of SSI and OASDI receipt.	Same. ^c
97,294	SER match in state with universal state-administered SSI supplement.	...	Accept the sum of the SSR and PHUS amounts for federal contribution to the sum of SSI and OASDI receipt. Add the lower estimate of state-administered supplement (see Appendix B).	Accept the sum of the SSR and PHUS amounts for federal contribution to the sum of SSI and OASDI receipt. Add the higher estimate of state-administered supplement (see Appendix B).

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

NOTES: ... = not applicable.

- a. Numbers below are counts of CPS person observations meeting indicated administrative match and CPS record content requirement for the row.
- b. When appropriate, SER and DER values are adjusted for self-employment income (SEI) losses reported in the CPS.
- c. "Same" means the same procedure as that used in the restrictive adjustment.
- d. Given evident respondent confusion over difference between SSI and OASDI, we consider benefit totals.

Table B-1.
State SSI payment supplementation, January 2002

State and (FIPS code)	Recipients of federally administered SSI payments (national count)	Universal income supplement—monthly benefit, other than the mandatory minimum supplementation (\$) ^a			Administration and take-up		Adjustment procedure ^b (1 = special rule; 2 = SSR + PHUS) (rule applied)
		SSI child, living with own family (child supplement)	Single adult, living independently (single supplement)	Couple, living independently (couple supplement)	Optional state supplement, federally administered (yes = 1; no = 0)	Optional supplement recipients— state or federally administered (state count)	
AL (1)	161,729	a	a	a	0	672	2
AK (2)	9,222	0	362.00	528.00	0	14,640	1
AZ (4)	85,308	a	a	a	...	677	2
AR (5)	85,369	...	...	...	...	...	2
CA (6)	1,113,679	98.00	205.00	515.00	1	1,093,860	2
CO (8)	53,821	37.00	37.00	347.00	0	34,982	1
CT (9)	49,953	a	202.00	277.00	0	21,984	1
DE (10)	12,310	...	...	...	1	590	2
DC (11)	20,099	a	a	a	1	1,680	2
FL (12)	387,626	a	a	a	0	15,169	2
GA (13)	198,294	...	...	...	...	...	2
HI (15)	21,402	4.90	4.90	8.80	1	19,680	2
ID (16)	19,034	52.00	52.00	20.00	0	10,795	1
IL (17)	250,212	...	...	...	0	38,388	2
IN (18)	89,586	a	a	a	0	1,383	2
IA (19)	41,146	a	22.00	44.00	1	6,630	2
KS (20)	36,759	...	...	...	...	...	2
KY (21)	176,458	a	a	a	0	4,739	2
LA (22)	166,574	a	a	a	0	5,121	2
ME (23)	30,390	10.00	10.00	15.00	0	34,977	1
MD (24)	89,380	a	a	a	0	3,016	2
MA (25)	167,359	114.39	114.39	180.06	1	162,740	2
MI (26)	211,615	14.00	14.00	28.00	1	210,340	1
MN (27)	66,331	a	81.00	111.00	0	38,146	1
MS (28)	128,800	...	...	...	...	...	2
MO (29)	113,990	a	a	a	0	8,486	2
MT (30)	14,324	a	a	a	1	924	2
NE (31)	21,572	8.00	8.00	a	0	5,884	2
NV (32)	27,403	a	c	d	1	7,250	2
NH (33)	12,101	a	27.00	21.00	0	6,780	1
NJ (34)	147,817	31.25	31.25	25.36	1	143,670	2
NM (35)	47,922	a	a	a	0	199	2
NY (36)	623,307	23.00	87.00	104.00	0	605,850	1
NC (37)	192,091	a	a	a	0	23,499	2
ND (38)	8,182	a	a	a	0	465	2

(Continued)

Table B-1.
State SSI payment supplementation, January 2002—Continued

State (and FIPS code)	Recipients of federally administered SSI payments (national count)	Universal income supplement—monthly benefit, other than the mandatory minimum supplementation (\$) ^a			Administration and take-up		Adjustment procedure ^b (1 = special rule; 2 = SSR + PHUS) (rule applied)
		SSI child, living with own family (child supplement)	Single adult, living independently (single supplement)	Couple, living independently (couple supplement)	Optional state supplement, federally administered (yes = 1; no = 0)	Optional supplement recipients—state or federally administered (state count)	
OH (39)	242,696	...	a	a	0	2,546	2
OK (40)	73,108	53.00	53.00	106.00	0	70,972	1
OR (41)	54,795	a	1.70	a	0	24,009	2
PA (42)	295,904	27.40	27.40	43.70	1	284,720	2
RI (44)	28,697	64.35	64.35	120.50	1	27,880	2
SC (45)	106,835	a	a	a	0	3,382	2
SD (46)	12,819	a	15.00	15.00	0	3,601	1
TN (47)	163,196	...	...	...	...	...	2
TX (48)	420,279	a	a	a	0	6,441	2
UT (49)	20,654	a	a	a	1	1,540	1
VT (50)	12,678	59.04	59.04	110.88	1	12,730	2
VA (51)	133,156	...	a	a	0	6,705	2
WA (53)	105,074	25.90	25.90	19.90	1	97,850	1
WV (54)	73,006	...	...	...	...	...	2
WI (55)	86,053	83.78	83.78	132.05	0	90,299	1
WY (56)	5,841	a	9.90	25.12	0	2,749	1

SOURCE: Unless otherwise noted, data for this table are derived from SSA (2004).

NOTES: FIPS = Federal Information Processing Standard.

... indicates a state that offers no optional state supplements regardless of one's living arrangement.

a. None for those states that offer a state SSI supplement, but not to persons living independently.

b. See the text. "SSR/PHUS" means SSA data employed exclusively; "rule" means administrative data on federal payment combined with "low" and "high" estimates of state-administered state supplement.

c. None, if younger than age 65; \$36.40 otherwise.

d. None, if neither person is aged 65 or older.

and thus are covered by the procedures outlined in Table A-1. Third, in cases in which state supplements are state-administered, we develop restrictive and inclusive estimates of the amounts involved and impute these figures to administrative SSI payment totals. The restrictive estimate assumes that the state supplement is received only in the months during the year in which a federal benefit is paid. The inclusive estimate assumes the state benefit is received in all months of any year in which a federal benefit

is paid in any month. Thus we are assuming in the restrictive-estimate case that any reduction in benefit amount that is the result of other income is taken from the federal payment, not the state supplement, and in the high-benefit case we assume that state eligibility continues for a longer period than federal benefit eligibility. There is little practical difference between the two because of the prevalence of application of these "special rule" state payments.

Appendix C: Propensity Functions for Sample Reweighting

This appendix reports parameter estimates for the logistic functions used for reweighting 2003 CPS/ASEC data for individuals in households meeting the administrative match criterion to account for the incomplete match. As discussed in the text, each person in the CPS who resides in a family in which at least one person was successfully matched to administrative data is included in the subsample. The log odds of this designation were estimated using a standard logit function and data for all individuals in the person's age class. The logit results were then translated into a point estimate of the probability of family match—"response." The inverse of this probability was then multiplied by the original CPS person weight to give a revised weight, adjusted for nonresponse.

Variables

All models are similarly constituted, using variables described in Table C-1 below.

Parameter Estimates

The propensity function was estimated separately for each of the three age groups. In each case, the dependent variable is the occurrence of an SER match for at least one person in the respondent's family (Table C-2).

Table C-1.
Propensity function variables

Variable name	Type	Description
<i>Independent</i>		
PSERGRP	Binary	Individual has at least one family member with a CPS/SER match.
<i>Dependent</i>		
AAGE	Continuous	Individual's age (in years) at the time of their CPS interview.
AAGESQB	Continuous	Equal to AAGE2.
AAGESQC	Continuous	Equal to AAGE3.
AAGETEEN	Binary	Individual is 16 or 17 years of age.
FAMREF	Binary	Individual is a family reference person.
HISPANIC	Binary	Individual is Hispanic.
MALERRT	Binary	Individual is male.
MARRIED	Binary	Individual is married.
METRO	Binary	Individual lives in a metropolitan statistical area (MSA).
METROCC	Binary	Individual resides in a MSA central city.
MINORITT	Binary	Individual is nonwhite.
MULTFAMH	Binary	Individual lives in a multi-family household.
NEGINC	Binary	Individual has negative family total income.
PRATIO	Continuous	Ratio of individual's family total income to his or her applicable family poverty threshold. If negative, set to zero.
PRATIO2	Continuous	If PRATIO > 2, PRATIO2 = PRATIO-2, otherwise 0.
PZEROINC	Binary	Individual has no family income.
SINGLE	Binary	Individual belongs to a one-person family, living alone in household.
UNRELOTH	Binary	Individual belongs to a one-person family, but shares a household with nonrelatives.

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

NOTE: For binary variables, the description identifies circumstance when indicator = 1; otherwise, the indicator value is 0.

Table C-2.
Parameter estimates: Logistic response propensity function, 2002

Variable	Children (aged 0–17)		Working-age adults (aged 18–64)		Elderly (aged 65 or older)	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Intercept	3.5171	0.0804	0.4972	0.2390	1.7056	0.2542
AAGE	-0.0450	0.0046	0.1372	0.0199	-0.0056	0.0031
AAGESQB	...	...	-0.0028	0.0005	...	...
AAGESQC	...	...	0.0000	0.0000	...	...
AAGETEEN	-0.6048	0.0563	...	...	...	...
FAMREF	-0.5565	0.2203	0.1236	0.0192	-0.0958	0.0408
HISPANIC	-0.3909	0.0457	-0.4046	0.0217	-0.1009	0.0596
MALEERRT	-0.0407	0.0360	-0.0788	0.0157	0.1061	0.0353
MARRIED	-0.6696	0.4355	0.1427	0.0234	-0.4649	0.0544
METRO	-0.3121	0.0431	-0.3540	0.0183	-0.3115	0.0363
METROCC	-0.0918	0.0464	0.0349	0.0200	-0.0092	0.0428
MINORITT	-0.1427	0.0458	0.0869	0.0208	0.5031	0.0467
MULTFAMH	0.2026	0.0779	0.1590	0.0493	0.4175	0.2362
NEGINC	-0.3280	0.4332	-0.7908	0.1687	-0.5033	0.5822
PRATIO	0.2002	0.0359	-0.0281	0.0188	0.1003	0.0399
PRATIO2	-0.2046	0.0380	0.0076	0.0193	-0.0933	0.0415
PZEROINC	-0.5989	0.1423	-0.6986	0.0617	0.0625	0.2001
SINGLE	...	...	-1.0263	0.0305	-0.5415	0.0595
UNRELOTH	-0.8095	0.2883	-1.4198	0.0522	-1.0500	0.2559
Observation count	66,016		129,460		20,384	
Mean propensity estimate	0.95		0.83		0.71	

SOURCE: Authors' calculations using 2003 CPS/ASEC data matched to administrative records.

NOTE: ... = not applicable.

Notes

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¹ Throughout this article, the term “state” includes the District of Columbia.

² To the extent that the Consumer Price Index is biased upward, indexation has led to slight growth in the real value of the SSI payment. See Gordon (2006).

³ See Census Bureau (2006) for a detailed CPS description.

⁴ The SER also includes earnings data. However, annual earnings reports in the SER are capped at the FICA/SECA taxable maximum (\$84,900 in 2002).

⁵ Information on retirement plan contributions in the DER corresponds to codes “d” through “h” in box 13 on the W-2 Form: 401(k); SIMPLE; 403(b); 408(k) and (6); SEP; 457(b); and 501(c), (18), and (D) plans (Smith, Johnson, and

Muller 2004, 8). See Abowd and Stinson (2005, 10) for a more detailed discussion on elements of gross compensation (for example, pretax health insurance premiums paid by the employee) that do not appear in the DER.

⁶ See Sears and Rupp (2003) for an investigation of the divergence between payment eligibility and payment receipt and the consequence for assessment of errors in OASDI reporting in the Survey of Income and Program Participation (SIPP). Koenig (2003) analyzes OASDI/SSI underreporting in the March 1997 CPS, but could at the time use only information on OASDI entitlement, not payments (as in the PHUS) for comparison with CPS reports.

⁷ Koenig (2003, 131) reports linking 75 percent of March 1997 CPS observations (for persons aged 15 or older) to SSA administrative data.

⁸ Burkhauser, Feng, and Jenkins (2007) discuss problems created by top-coding for analysis of trends at the top end of the earnings distribution.

⁹ Koenig (2003, 132) reports that 31.2 percent of known SSI recipients for 1996 (as reported in the 1997 March CPS) do not report SSI receipt in the CPS. Table 4 indicates that our result for 2002 is 40 percent. The Koenig estimate is

weighted; ours is not because we are not interested at this point in statistical inference.

¹⁰ Huynh, Rupp, and Sears (2002) report similar problems in the SIPP.

¹¹ It is possible to imagine scenarios in which persons residing in a state with a state-administered supplement would be missing an SSR entry and therefore would not receive either the restrictive or inclusive imputation, yet might report such amounts in the CPS/ASEC. Such cases, if they exist, are certain to be rare.

¹² In fact, the adjustments are in many cases quite large. In both the restrictive and inclusive cases, for roughly 60 percent of individuals for whom some adjustment was made the absolute value of the total income adjustment exceeded \$2,000. The restrictive adjustment procedure affects more observations than does the inclusive alternative. These details are available on request from the authors.

¹³ We have calculated all of the estimates cited later using subsample (c) instead of (a), and none of the outcomes reported is qualitatively dependent on choice of sample. These results are available from the authors.

¹⁴ “We” here includes our colleagues Paul Davies and the late Jeff Shapiro, without whose assistance this table could not have been constructed.

¹⁵ See SSA (2002). The methodology for SSA’s estimate, based in part on an unidentified “1996 study,” is not detailed.

¹⁶ Practices vary. The half-of-median standard generally applies to income before taxes; the European Union uses 60 percent of median disposable income (Eurostat 2007, 36).

¹⁷ In principle, states have the option of terminating these programs. However, if any state does terminate its SSI supplement program it loses eligibility for reimbursement for the federal share of Medicaid costs. At minimum, states are required to sustain either nominal payment levels or aggregate expenditure levels in order to retain Medicaid reimbursement. See Committee on Ways and Means (2004, 3–25).

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