SESHD Working Paper #2017-39

Do Older Americans Have More Income Than We Think?

Adam Bee (U.S. Census Bureau)

Joshua Mitchell (U.S. Census Bureau)

July 2017

Abstract

The Current Population Survey Annual Social and Economic Supplement (CPS ASEC) is the source of the nation's official household income and poverty statistics. In 2012, the CPS ASEC showed that median household income was $33,800 for householders aged 65 and over and the poverty rate was 9.1 percent for persons aged 65 and over. When we instead use an extensive array of administrative income records linked to the same CPS ASEC sample, we find that median household income was $44,400 (30 percent higher) and the poverty rate was just 6.9 percent. We demonstrate that large differences between survey and administrative record estimates are present within most demographic subgroups and are not easily explained by survey design features or processes such as imputation. Further, we show that the discrepancy is mainly attributable to underreporting of retirement income from defined benefit pensions and retirement account withdrawals. Using archived survey and administrative record data, we extend our analysis back to 1990 and provide evidence of underreporting from an earlier period. We also document a growing divergence over time between the two measures of median income which is in turn driven by the growth in retirement income underreporting. Turning to synthetic cohort analysis, we show that in recent years, most households do not experience substantial declines in total incomes upon retirement or any increases in poverty rates. Our results have important implications for assessing the relative value of different sources of income available to older Americans, including income from the nation's largest retirement program, Social Security. We caution, however, that our findings apply to the population aged 65 and over in 2012 and cannot easily be extrapolated to future retirees.

 We thank Jonathan Rothbaum, Trudi Renwick, Sonya Porter, and Mark Leach for their support and reviews; Lori Reeder, Gary Benedetto, Gloria Duval, John Eltinge, and Julia Manzella for their reviews, seminar participants at SSA, IRS, GAO, the NBER Women Working Longer workshop, the Federal Reserve Board of Governors, and CBO for their insightful comments; Patricia Ruggles, Courtney Coile, and John Sabelhaus for their discussions; Jessica Holland, Kevin Pierce, Dan Feenberg, Dylan Rassier, Amy O'Hara, and Victoria Bryant.

I. Introduction

Are Americans adequately prepared for retirement? Using a variety of methods and assumptions, researchers have arrived at starkly different answers to this important question. Common to nearly all approaches, however, is a reliance on household survey data to measure the economic resources available to older Americans. Yet, it has long been recognized that income aggregates derived from popular household surveys fall short of comparable administrative record totals.[1] For older Americans in particular, analysts have raised concerns that survey-based income aggregates from employer-sponsored retirement plans and IRAs appear to be too small.[2]

By itself, however, evidence of aggregate income underreporting cannot address a key distributional question: Does income underreporting only affect the measured economic status of the wealthiest households, or does it broadly alter our understanding of the well-being of older Americans? This question has remained unanswered to date because it requires validation of survey income responses on a person-by-person basis.

In this paper, we overcome this obstacle and develop new, nationally representative estimates of income and poverty for the population aged 65 and over. We do this by linking survey data collected by the U.S. Census Bureau with an extensive array of administrative income records from the Social Security Administration (SSA) and the Internal Revenue Service (IRS) spanning nearly a quarter century.

Our starting point is the Census Bureau's Current Population Survey Annual Social and Economic Supplement (CPS ASEC), the source of the nation's official income and poverty statistics. We focus on comparing five types of income available in both the CPS ASEC and the administrative records: earnings, Social Security benefits, Supplemental Security Income (SSI), interest and dividends, and retirement income. By retirement income, we mean all amounts received from defined benefit pension plans including survivor and disability payments (excluding Social Security) as well as all employer and IRA defined contribution distributions that permanently leave tax-preferred accounts.[3]

Replacing survey income responses with administrative record values leads to several striking findings. First, relative to the 2012 number derived from the CPS ASEC alone, the median income for householders aged 65 and over is 30 percent higher in the linked sample (rising from $33,800 to $44,400). Second, the poverty rate for persons aged 65 and over is 2.1 percentage points lower in the linked sample (falling from 9.0 to 6.9 percent). Third, across most of the income distribution, we find that retirement income underreporting is mainly responsible for the overall income discrepancy, while self-reported earned income and Social Security

[1] For example, Rothbaum (2015) compares Census survey income aggregates to the National Income and Product Accounts which in turn derive many of its numbers from administrative records.
[2] Schieber (1995) provides an early example of this argument. Woods (1996) critiques his analysis.
[3] We discuss alternative income concepts in Section III.

benefits correspond well with administrative records. Further, the underreporting of retirement income occurs mostly at the extensive margin—that is, people who actually receive retirement income fail to report any of it in the survey 46 percent of the time. In contrast, when reported, retirement income amounts in the CPS ASEC match administrative record amounts fairly well.

We next explore potential reasons why the two measures of retirement income diverge. Demographic characteristics are only weakly related to false negative reports. Additionally, most survey design features such as imputation cannot explain the gap. The most powerful predictors of underreporting are the characteristics of the actual retirement income received. Those with larger and more stable amounts of administrative record retirement income are more likely to report receipt in the survey. Consistent with concerns raised in the literature, distributions from IRAs are rarely reported. Nonetheless, we show that even those with considerable amounts of employer-sponsored retirement income still have high false negative rates. Even those who receive distributions from traditional government defined benefit plans still frequently fail to report them. Thus, while the previous literature has related aggregate discrepancies to the transition to defined contribution systems, it has largely ignored the possibility that defined benefit income is also underreported.

Using archived administrative record data, we extend our linked sample analysis of income and poverty back nearly a quarter of a century. We find that there was a smaller but still substantial median income discrepancy of 20 percent in 1990 such that the survey shows median incomes grew only 18 percent between 1990 and 2012, while the administrative records show growth of 29 percent.[4] Paralleling the rising median income gap is a rise in retirement income false negatives. Remarkably, the survey shows no evidence of any rise in retirement income receipt during this period, with an estimated rate of receipt of 40 percent in 1990 and 36 percent in 2012. In contrast, the administrative records show over this same period that the rate of receipt rises from 45 percent to 61 percent. Meanwhile, poverty rates are lower in the administrative records in all years examined, although the trend in poverty rates is largely unaffected.

Our new income measures change the relative importance of different sources of income available to the aged. In particular, we show that throughout much of the income distribution, Social Security is a smaller share of total income in large part due to the higher measures of retirement income. We also show at the bottom of the distribution that survey respondents frequently confuse Social Security with SSI such that SSI plays a larger role among the low-income aged population than the survey suggests. In light of this, we reassess commonly cited statistics on the share of beneficiaries depending on Social Security income and the number of people lifted out of poverty by Social Security. In particular, the share of beneficiaries that

[4] We calculate variances for 1990 by multiplying the CPS 1990 margin of error by the same ratio of the admininstrative 2012 margin of error to the CPS 2012 margin of error, since neither generalized variance functions nor replicate weights are available.

depend on Social Security for at least 90 percent of their income falls by half, and the number of people lifted out of poverty by Social Security falls by one-third.

Our distributional analysis does not discount, however, the relative importance of total annuitized income. We develop a novel methodology to identify types of administrative record retirement income and find that defined benefit income is still the predominant source of retirement income for most of the aged in 2012.

Lastly, we conduct a synthetic cohort analysis that compares incomes and poverty rates during an 11-year window surrounding the claiming of Social Security benefits. The survey measures show overall income drops that are twice as large as the administrative records as well as substantially larger increases in the proportion of claimants living under 200 and 300 percent of the poverty threshold. Overall, when using the administrative records, we find income declines that are gradual and predate retirement as well as no evidence of an increase in poverty rates. Further, income five years after claiming Social Security remains high relative to measures of career-average earnings.

We argue these results challenge the "retirement consumption puzzle," the finding in many household surveys that consumption, particularly food consumption, appears to decline sharply at retirement. This is considered a puzzle because it implies that many households are myopic and fail to save adequately for retirement, which contradicts the predictions of the standard lifecycle model. When using the administrative records, however, we do not find large, abrupt declines in income or increases in poverty upon retirement. Thus, we argue that the premise of the puzzle is not correct—retirement does not appear to be a fruitful setting to examine consumption responses to a large, predictable decline in income.

While our work yields many new and surprising findings, we are certainly not the first to call attention to the measurement of retirement income in the CPS ASEC (Anguelov et al., 2012; Czajka and Denmead, 2012; Gustman et al., 2014; Iams and Purcell, 2013; Munnell and Chen, 2014; Sabelhaus and Schrass, 2009). The CPS ASEC underwent a redesign in survey year 2014. This was done in part to improve the collection of retirement incomes in an environment where retirees will increasingly rely on irregular withdrawals from defined contribution retirement accounts. Evaluations of the redesign found modest improvements in median incomes and no evidence of any change in poverty for the aged (Semega and Welniak, 2015; Mitchell and Renwick, 2015). In this paper, we only reevaluate the traditional CPS ASEC, but we hope to examine the redesigned version in future work as more recent years of administrative record data become available.

We must also acknowledge several important caveats to our findings. First and foremost, our revised income and poverty measures apply to the aged population through 2012 and cannot easily be extrapolated to future retirees. There are many demographic, labor market, and retirement policy changes that future cohorts will face. For example, future cohorts will have

access primarily to defined contribution plans. How they will fare in retirement remains an open question. Second, even among recent retirees, incomes cannot capture all relevant aspects of material well-being. If Americans are entering retirement with rising debt levels that they must service, then higher incomes may not translate into higher consumption (Lusardi and Mitchell, 2017; Butrica and Karamcheva, 2013). On the other hand, our study reevaluates only five sources of income. To the extent other sources of income are also underreported among the aged, total incomes could be even higher than what we find.

The rest of this paper proceeds as follows. Section II reviews the relevant literature. Section III discusses alternative income concepts. Section IV describes the survey and administrative record data. Section V presents results. Section VI concludes.

II. Review of Literature

Our work builds on previous efforts to measure the economic well-being of the aged. Studies that compare income and consumption-based measures of total resources and poverty are particularly relevant. Cutler and Katz (1991a, b), Hurd and Rohwedder (2006), and Meyer and Sullivan (2010, 2012) argue that consumption-bases measures are attractive from both a conceptual and practical standpoint. Consumption may be a better proxy for long-run living standards if individuals can access savings to smooth over temporal fluctuations. A consumption-based poverty measure may also have practical value if survey respondents have special difficulty reporting certain types of income. This may be particularly relevant for the aged, who are increasingly dependent upon a complex array of retirement income resources. These studies suggest considerably more economic progress for the aged when using survey-based measures of consumption rather than income. Using linked data, our work provides an explanation for these disparate findings. Consumption-based measures may indeed be more accurate if retirement income is underreported.

Other studies focus on measuring consumption at the onset of retirement. As mentioned, the standard lifecycle model predicts that households should want to avoid sharp drops in consumption in response to anticipated changes in income. Yet many prominent studies, such as Bernheim et al. (2001) and Banks et al. (1998), have found that consumption, including food consumption, does fall considerably at retirement, implying that households are myopic.

More recent studies have questioned the retirement consumption puzzle. Hurst (2008) argues that evidence of a consumption decline is limited to two categories: work-related expenses, and food expenditures. With respect to food, expenditures need not be the same as consumption. Aguiar and Hurst (2005, 2007) show that retiring households increase time spent on food preparation and time spent shopping for bargains and substitute away from spending on meals outside the home. The result is a decline in food spending but not in food consumption. Households that do experience large consumption declines at retirement tend to be those that

experience permanent health shocks, as shown in Hurd and Rohwedder (2013). This behavior is consistent with the standard lifecycle model.

What happens to incomes at the onset of retirement is less studied, however. In this paper and in our related work on women's retirement behavior (Bee and Mitchell, 2016) we do not find strong evidence of large, abrupt declines in incomes at retirement. Similarly, Brady et al. (2017) find, using a sample of tax filers, that most households are able to maintain their income available for spending three years after retirement. Together, these papers call into question the premise of the retirement consumption puzzle—that there are predictable declines in incomes at retirement.

Another issue is whether households can maintain their standard of living many years into retirement. One way to address this question is to examine the trajectory of wealth during retirement years. Love et al. (2008) find evidence that wealth declines more slowly than remaining life expectancy. De Nardi et al. (2010) attribute the slow decline of wealth to precautionary savings for rising out-of-pocket medical expenses. Poterba et al. (2015) demonstrate that wealth is remarkably persistent in retirement. Consistent with our findings, a slow decline in retirement wealth may be feasible if retirees in fact have higher incomes than previously thought.

Our work also provides useful context for studies that forecast the well-being of future retirees (Skinner, 2007). More optimistic studies find favorable comparisons between observed savings behavior during working years and predictions of optimal behavior based on augmented lifecycle models or other established benchmarks (Butrica et al., 2012; Devlin-Foltz et al., 2016; Engen et al., 1999; Hubbard et al., 1995; Scholz et al., 2006). On the other hand, some studies argue that a majority households face saving shortfalls and will be unable to maintain their standard of living in retirement (Bernheim et al., 2000; Munnell et al., 2014). Our results suggest that future work should examine the sensitivity of these survey-based predictions to other measures of resources available in administrative records.[5]

Lastly, our work relates to the large literature examining survey measurement error. Besides our own exploratory work in Bee (2013) and our examination of women's retirement in Bee and Mitchell (2016), there have not been previous microdata studies that validate retirement income. Survey methodologists have found indirect evidence, however, that asking about retirement account withdrawals immediately after asking about account balances improves survey retirement income reporting in the Survey of Consumer Finances and the Health and Retirement Study (Argento et al., 2015; Bosworth and Burke, 2012).

Others have examined survey responses to retirement plan participation questions during working years. Early work by Mitchell (1988) with the SCF and a comprehensive survey by Gustman et al. (2010) using the HRS find that many participants are unaware of key plan

[5] Some of these studies do make use of administrative-record earnings histories.

features and often confuse defined benefit with defined contribution plans. Recent work using household surveys linked to earnings records reveals that self-reports of defined contribution participation are biased downward (Dushi and Honig, 2015; Dushi and Iams 2010). It is perhaps not surprising that if survey participants have difficulty reporting retirement plan information during working years, they continue to have difficulty after they retire.

III. Income Concepts

There are many different perspectives on what should be counted as income. The classic Haig-Simons income is defined as the maximum amount that can consumed without lowering net worth. In this framework, income in retirement plans should be counted as it accrues. Most household surveys do not attempt this. The CPS ASEC was designed to collect *money income* which is defined as "income received on a regular basis (exclusive of certain money receipts such as capital gains) before payments for personal income taxes, Social Security, union dues, Medicare deductions, etc." [6,7] While traditional defined benefit/annuity income clearly satisfies the money income criteria and should be captured by the survey, the private sector transition to defined contribution systems poses a conceptual challenge for the CPS ASEC. Retired individuals may opt to make withdrawals from their defined contribution accounts on an as-needed rather than regular basis. These withdrawals could be considered dissaving rather than income. Issues such as the proper treatment of rollovers (moving money from one tax-preferred account to another) and other lump-sum distributions further complicate matters. Yet another concern is that some withdrawals from retirement accounts reflect past employee contributions that already would been counted as wage income. Prior to the redesign, the CPS ASEC only sought to count payments from IRAs and other defined contribution accounts to the extent they were received regularly.

Other federal agencies rely on different income concepts. For example, the IRS excludes from income the contributions made to (non-Roth) defined contribution accounts as well as the interest, dividends, and capital gains accrued within those accounts. At the time money is withdrawn, it is included in income and subject to taxation. The Bureau of Economic Analysis (BEA) uses yet another set of standards for national income accounting purposes. International guidelines from the 2008 System of National Accounts state that retirement plans should be treated as redistributions so that measures of disposable income reflect retirement benefit payments rather than accrual-based income. However, the U.S. does not follow international guidelines and instead counts contributions as well as interest and dividends (but not capital gains) when earned in its measure of disposable income. McCully (2014) and Lusardi et al. (2001) discuss advantages of adhering to the international guidelines.

[6] Ruser et al. (2004) compare Haig-Simons, personal, and money income concepts.
[7] https://www.census.gov/topics/income-poverty/income/about.html

Some researchers have sought a middle ground between income and consumption. As discussed earlier, consumption may serve as a better proxy for well-being, particularly for the aged. Using survey data, Short and Skog (2014) explore how including retirement account withdrawals net of contributions as resources available to spend on basic needs would change the Supplemental Poverty Measure for the population aged 65 and over. Brady et al. (2017) develops the concept of "spendable income" which is a measure of after-tax income that also incorporates retirement account withdrawals net of contributions.

In this paper, we count all gross distributions that permanently leave tax-preferred retirement plans as income, regardless of whether they are taxable in that year. This includes payments received from defined benefit plans, as well as employer defined contribution and IRA withdrawals (both traditional and Roth). To avoid double-counting, we exclude distributions such as direct rollovers and conversions which simply move money across different tax-preferred accounts. Our definition is consistent with the goals of SSA researchers Anguelov et al. (2012) who argue that household surveys including the (traditional) CPS ASEC "need to revise their measures of retirement income to account for periodic (irregular) distributions from DC plans and IRAs." Beginning with survey year 2014, the redesigned CPS ASEC now includes irregular distributions in income. Our measure is also consistent with the family income numbers released in the Federal Reserve Bulletin which incorporate both pensions and withdrawals from retirement accounts.[8] Lastly, the decision to count withdrawals as income is also a practical one, given the administrative record data that have been made available to us. We describe these data next.

IV. Data

We bring together several survey and administrative record data sources to reassess incomes of older Americans. We describe each of them below.

The primary purpose of the CPS is to measure the monthly unemployment rate for the civilian non-institutionalized population. Between February and April, the CPS ASEC collects detailed information on amounts and sources of incomes received in the previous calendar year for approximately 75,000 households. These data have been used to produce annual income and poverty statistics since 1959. The first part of our analysis focuses exclusively on reference year 2012. We later extend our analysis to cover reference years 1990, 1995, and 1998-2012.

While incomes are collected for each household member aged 15 and over, we focus on total pre-tax household income and classify households by the demographic characteristics of the householder as in DeNavas-Walt et al. (2013). Unlike the annual report, we restrict our attention to householders aged 65 and over. When measuring poverty, the resource unit is either a family or an unrelated individual rather than the household. A family is defined as two or more persons

[8] See "Changes in U.S. Family Finances from 2010 to 2013: Evidence from the Survey of Consumer Finances" https://www.federalreserve.gov/pubs/bulletin/2014/pdf/scf14.pdf

related by blood, marriage, or adoption. A person is classified as in poverty if total pre-tax family (or unrelated individual) income is below the relevant poverty threshold which varies based on family size and composition. Similar to income, we examine the poverty status of persons aged 65 and over.[9]

Of particular interest are the CPS ASEC questions related to retirement income. There are several points during the interview where respondents might report such income. The main CPS ASEC question is:

"During 2012 did (you/ anyone in this household) receive any pension or retirement income from a previous employer or union, or any other type of retirement income (other than Social Security or VA benefits) ?

If the respondent indicates someone in the household received such income, follow-up questions ask who in the household received the income, the amounts received, and the particular sources of this income. There are also parallel questions for disability and survivor income (also apart from VA Benefits and Social Security) which are included in our definition of retirement income. We also choose to include VA pension, survivor, and disability payments asked earlier in the interview because we have reason to believe some respondents may misclassify their military pensions as VA benefits.[10] Lastly, the CPS ASEC asks a final question about any other income not already mentioned. If respondents indicate they have other income either from pensions or annuities, we include this in our measure of retirement income.

The CPS ASEC is linked to several administrative record sources supplied by the Social Security Administration.[11] These include data on annual earnings from both wage and salary jobs (IRS form W-2) and self-employment (IRS 1040 schedule SE), total OASDI benefits received (including any deductions for Medicare premiums), and total SSI benefits (including any state supplements). Up through 1990, the SSA earnings records also include information from IRS form W-2P "Statements for Recipients of Annuities, Pensions, Retired Pay, or IRA payments"

[9] In supplementary analysis, we make use of two additional Census surveys which we also link to select administrative records: the Survey of Income and Program Participation (SIPP) and the American Community Survey (ACS). We discuss linkages to the SIPP in Bee and Mitchell (2016) and linkages to the ACS in Bee et al. (2016).

[10] This will bias our survey measure of retirement income upward relative to the administrative records because VA Benefits are not taxable and do not show up in the available administrative records.

[11] Persons in the CPS ASEC are linked to administrative records via the Personal Identification Key (PIK), a scrambled SSN. In recent years, the PVS process is used to assign a PIK to approximately 90% of people aged 65 and over. Details of the PVS process are contained in Wagner and Layne (2014). We reweight the PIK subsample to be representative of the full sample. Specifically, we run a logistic regression to model the likelihood of being assigned a PIK as a function of survey demographic and income characteristics. We then multiply the CPS ASEC survey weight by the inverse of the estimated propensity score. Individuals with a PIK who fail to match to a given administrative income source (besides Form 1040) are assumed to not have any income from that source. We are unable to link persons not assigned a PIK to administrative records. For these persons, we continue to use their survey income values. Incomes of persons without a PIK are incorporated into the total family and household incomes of persons who are assigned a PIK.

which allow us to measure periodic payments of retirement income during an early time period.[12] Lastly, SSA also supplies the Census Bureau with the Numident file which contains date of birth and date of death information used in parts of our analysis.

We also link the CPS ASEC to two types of universe records obtained from the IRS. The first is the information return form 1099-R "Distributions From Pensions, Annuities, Retirement or Profit-Sharing Plans, IRAs, Insurance Contracts, etc." Available to us from the 1099-R are the gross distributions from employer-sponsored plans (both defined benefit and defined contribution) as well as IRA withdrawals which we combine to measure total retirement income from 1995 onward.[13] Besides the IRA/employer-sponsored distinction, we do not receive any additional information about the types of distributions received.[14] Importantly, however, the IRS excludes certain kinds of distributions from our extracts which we would not wish to consider income. The main types of excluded distributions are direct rollovers, Section 1035 exchanges, and Roth conversions. Together with the form W-2P for early years (which never included rollovers), the 1099-R provides administrative record measures of retirement income spanning over three decades.

The second type of record obtained from IRS is the form 1040 filed by taxpayers for tax years 1989, 1995, and 1998-2012. Total dividend income as well as taxable and tax-exempt interest are available to us from the 1040. For joint filers, we assume an even split of dividend and interest income among the primary and secondary filer, and we assume zero asset income for dependents. Not everyone files a 1040 each year, so for non-filers we simply use the CPS ASEC values for interest and dividends.

Appendix Table 1 shows the five types of income in the CPS ASEC that we validate, the survey variable definitions, and the corresponding administrative record sources. Outside these five types of income, we continue to use the CPS ASEC values in constructing total incomes.[15] After creating new measures of total income for each person, we aggregate up to the household level to recalculate standard median income statistics and to the family level to reevaluate poverty status.

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[12] As far as we are aware, we are the first to take advantage of this high-quality administrative record source of historical retirement income data. See Bee and Mitchell (2016) for a comparison of women's retirement incomes extending back to the 1980s using Form W-2P data.

[13] An advantage of measuring retirement distributions from the information return is that we capture this income regardless of whether someone files a 1040 in that particular year. Taxpayers who *are* required to file are instructed to transfer the applicable amounts from the 1099-R to lines 15 and 16 of the Form 1040. Lines 15a and 16a are meant to capture gross amounts while 15b and 16b capture taxable amounts. Our 1099-R extracts include some amounts that are not taxable such as Roth distributions. This is consistent with our aim of measuring retirement income once when it permanently leaves the tax-preferred system.

[14] The IRA category also includes SEP and SIMPLE type plans.

[15] Other types of income collected by the CPS ASEC include unemployment compensation, workers' compensation, public assistance, rents/royalties/estates/trusts, educational assistance, alimony, child support and financial assistance from outside the household. Within the survey, the five sources we validate account for 97 percent of aggregate total income among persons aged 65 and over.

V. Results

V.1. Analysis of Aggregates

We begin with a comparison of 2012 aggregate income amounts. Table 1 computes three sets of aggregates for two age groups, persons aged 18 to 64 and persons aged 65 and over. The first set of aggregates, shown in column 1, is derived from the "Full CPS Sample," and totals five types of income (earnings, Social Security, SSI, interest & dividends, and retirement income) from the complete 2013 CPS ASEC sample. The second set of aggregates, shown in column 2, is calculated from the "CPS PIK Sample", the subset of persons in the Full CPS Sample who are assigned a PIK. The CPS PIK Sample is reweighted to represent the Full CPS Sample and also uses survey responses to calculate income aggregates. The third set of aggregates is labeled the "Linked CPS-Admin Sample" and is shown in column 3. This is the same set of persons as the CPS PIK Sample but uses administrative record values rather than survey responses to calculate aggregates.

Column 4 makes the direct comparison between survey and administrative aggregates by expressing the CPS total (from column 2) as a share of the administrative record total (from column 3). For both age groups, CPS earned income tracks the administrative record measure very closely, accounting for approximately 100 percent of the target amount for those aged 18 to 64 and 98 percent of the target amount for those aged 65 and over. Social Security benefits are also reported relatively well, particularly for the aged. The CPS captures 83 percent of the target amount for those aged 18 to 64 and 96 percent of the target amount for those aged 65 and over.[16] CPS reporting of SSI benefits is more complex. Persons aged 18 to 64 appear to overreport SSI, while those aged 65 and over only report 73 percent of the target amount.[17] However, SSI misreporting is modest in the aggregate because SSI benefits account for only a small share of total income for both age groups.[18] In contrast, the underreporting of asset income is evident for both age groups and is important in the aggregate for persons aged 65 and over. Specifically, CPS interest and dividends account for only 77 and 63 percent of their respective targets. For persons aged 65 and over, interest and dividends represent 11 percent of their total incomes in the administrative records.[19]

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[16] When using administrative record rather than survey values, Social Security's share of aggregate income falls from 39 percent to 31 percent for persons aged 65 and over. We discuss changes in the relative importance of Social Security in Section V.10.

[17] In the CPS, adults are also requested to report SSI benefits received on behalf of any children under age 15. In order to compare to the administrative records, we subtract child benefits from the survey aggregates to restrict to SSI benefits received by adults. There appears, however, to be relatively few respondents who indicate any child SSI receipt. This raises the possibility that some of the reported adult SSI benefits are misclassified and the survey SSI aggregate amount for persons aged 18 to 64 is inflated. If we instead included administrative record amounts of SSI received by children aged 0 to 14 together with their parents, this would result in an additional 7 billion dollars of SSI benefits among persons aged 18 to 64 and bring the two data sources into closer alignment.

[18] "Total income" in Table 1 refers to the combined income from the five sources where administrative records are available.

[19] Comparions beyond those explicitly stated are not tested for statistical significance.

Most striking are the retirement income comparisons. The CPS accounts for only 45 percent of the target for persons aged 18 to 64 and 48 percent of the target for persons aged 65 and over. Naturally, retirement income underreporting is more consequential for the measurement of older Americans' incomes. In the administrative records, retirement income accounts for only 5 percent of total income for persons aged 18 to 64 but 34 percent of total income for persons aged 65 and over. For this reason, overall income underreporting differs markedly by age group. Because earned income is the dominant income source for persons 18 to 64 and is reported very well, the CPS still captures 96 percent of total income for this age group. In contrast, the CPS captures only 76 percent of total income for persons aged 65 and over. For the remainder of our analysis, we therefore focus on the consequences of income underreporting among the older population.

Our aggregate comparisons represent an improvement over previous studies because we are able to examine underreporting for the same set of individuals and report our results separately for the aged and non-aged populations. However, the main advantage of the linked microdata is that we can move beyond aggregates and examine the full distributional implications of income underreporting. We therefore turn to the analysis of median incomes.

V.2. Analysis of Median Incomes

Table 2 compares survey and administrative record estimates of median household income. Consistent with the annual income and poverty report (e.g., DeNavas-Walt et al., 2013), households are classified by the demographic characteristics of the CPS householder. Results are again shown for the Full CPS Sample, the CPS PIK Sample, and the Linked CPS-Admin Sample. Column 4 computes the percentage difference between the administrative record and survey values. Among all householders aged 65 and over, median incomes are 30 percent higher in the administrative records ($44,400 versus $34,000). As the table indicates, economically meaningful and statistically significant median differences are found among a wide variety of family, race/ethnicity, age, nativity, disability, region, residence, educational attainment, housing tenure, and veteran status subgroups. For example, the median difference is 21 percent for those aged 65 to 74, 37 percent for those aged 75 to 84, and 33 percent for those 85 and over. Income differences are also not strongly related to proxies for socioeconomic status such as educational attainment. Householders of all educational attainment levels have large median income differences. Overall, our results demonstrate that correcting for income underreporting meaningfully changes our assessment of the material well-being of the typical aged household.[20]

V.3. Analysis of Poverty Rates

Table 3 examines survey- and administrative record-based poverty rates for persons aged 65 and over. Among all aged persons with a PIK, the poverty rate falls from 9.0 percent in the

[20] In Appendix Table 2, we run separate median regressions for survey and administrative record income that include all demographic variables listed in Table 2 as covariates.

survey to 6.9 percent in the linked sample. Poverty rates also fall when we classify persons by family status, race/ethnicity, gender, age, region, residence, disability, educational attainment, housing tenure, and veteran status. The new poverty estimates are not only lower, but in some cases, they alter our understanding of the relative well-being of the various demographic subgroups. For example, the survey suggests that poverty rises sharply by age—7.9 percent for those aged 65 to 74, 9.8 percent for those aged 75 to 84, and 12.1 percent for those aged 85 and over. In contrast, the administrative records show a much flatter pattern—6.7 percent, 7.0 percent, and 7.6 percent, respectively. Although this comparison is cross-sectional, it is consistent with a greater ability of households to maintain their standard of living as they age.

Another illustrative comparison is housing tenure, a useful survey-based proxy for wealth. The survey shows considerably higher poverty rates for those who own a home without a mortgage than for those who have a mortgage, 7.3 percent versus 4.6 percent. The administrative records indicate a much smaller gap, 4.4 percent versus 3.1 percent. Aged renters, on the other hand, have a much higher survey-based poverty rate of 21.3 percent, and there is no evidence of a decline when using the administrative records to measure income.

Other common poverty group comparisons are only modestly changed when using the administrative records. For example, the survey shows that poverty rates are higher for women than men, 10.8 percent versus 6.7 percent. Using the administrative records, the rates are lower for both sexes but still 8.5 percent for women versus 4.9 percent for men. Overall, the results in Table 3 show that income underreporting meaningfully affects our assessment of poverty among the aged.[21]

V.4. Accounting for the Overall Income Discrepancy

The results in Tables 2 and 3 incorporate all five administrative record income sources at once. Naturally, this raises the question of which income source is most responsible for our findings. In Table 4, Panel A, we recalculate several iterations of household income percentiles as well as the fraction of people below specified thresholds of the income to poverty ratio. The results are also shown graphically for every percentile in Figure 1. For each iteration, one survey income source is swapped with its administrative record counterpart and then households (for income) and persons (for poverty) are re-ranked based on this new measure of total income. The change is then computed relative to the CPS baseline values. The swapping is cumulative so that by the end of the fifth iteration, all administrative record sources are included in income.[22] Column 2 shows the effect of swapping earned income, column 3 shows the effect of swapping earned income and Social Security, and column 4 shows the effects of swapping earned income, Social Security, and SSI. Across these columns, few economically meaningful differences in household income percentiles are found relative to the CPS baseline. Somewhat larger effects are

[21] In Appendix Table 3, we run separate linear probability models for survey and administrative record poverty status that include all demographic variables listed in Table 3 as covariates.
[22] Table 4, Panel B repeats this exercise but examines the effect of swapping each income source on its own.

found (in proportional terms) when interest and dividends are also swapped in column 5, particularly in the bottom half of the income distribution. As shown in column 6, however, the large overall income differences found can be attributable to replacing survey with administrative record measures of retirement income. This holds across much of the income distribution. For example, swapping the first four income sources results in a 7 percent higher 25th percentile of household income (relative to the CPS baseline 25th percentile), while also swapping retirement income increases this difference sharply to 26 percent. At the 75th percentile, there is only a 1 percent income difference after swapping the first four income sources, but after retirement income is also swapped, the overall income difference jumps to 22 percent.

Retirement income is somewhat less dominant when looking at the change in the measured proportion of persons in poverty. Still, it remains the single most important factor, accounting for 1.2 of the total 2.1 percentage point decline. At higher income to poverty ratios, retirement income's importance is also apparent, accounting for 6.4 of the 9.8 percentage point reduction in persons with incomes below 200 percent of poverty. Clearly, the underreporting of retirement income is central to understanding the overall income discrepancies found. This holds across broad swaths of the income distribution.

V.5. Understanding Retirement Income Underreporting

In explaining why survey and administrative record measures of retirement income differ so dramatically, it is useful to classify potential types of misreporting. A *false negative* refers to the absence of survey income when income is in fact present in the administrative records. A *false positive* refers to the presence of survey income but no income found in the administrative records. Of course, for many individuals, the two data sources are consistent. In such cases, a *true negative* refers to zero income in both data sources and a *true positive* refers to positive income in both data sources. When analyzing misreporting, we also distinguish between receipt of any income and the amount of income received, conditional on receipt. Underreporting at the *extensive margin* is simply a false negative report. Underreporting at the *intensive margin* refers to a true positive report, but a lower income amount recorded in the survey than in the administrative records.[23]

[23] There is some ambiguity here. Individuals may in fact receive distributions from multiple retirement plans, each generating its own 1099-R form. (Appendix Table 4 reports the distribution of the number of 1099-Rs received). Survey respondents also have the opportunity to report multiple sources of retirement income. Thus, it is possible for a respondent to accurately report one type of retirement income but neglect to mention a second type of retirement income. In this case, we classify this respondent as a true positive report with underreporting at the intensive margin because the total amount of retirement income reported is lower than the total amount in the administrative records. Alternatively, one could attempt to track the quality of reporting for each separate retirement account, in which case the failure to mention the second account could be considered extensive margin underreporting. Relative to this alternative classification system, we will tend to understate the incidence of underreporting at the extensive margin and overstate the amount of underreporting at the intensive margin.

Along these lines, Table 5 decomposes the impact of different types of retirement income misreporting across the household income distribution, across various income to poverty thresholds, and across the person-level retirement income distribution. We begin in column 1 with the CPS baseline values and correct in a cumulative fashion for each type of retirement income misreporting. In column 2, we replace the false positives with zeros which can only lower incomes and raise poverty estimates. In column 3, we replace true positives with administrative record values which corrects for intensive margin misreporting. In column 4, we replace false negatives with administrative record values which raises incomes and lowers poverty estimates. Columns 5 through 7 then calculate the percentage of the total measured income or poverty change that is attributable to each type of correction. Note that the three corrections must sum to 100 percent so while correcting for false positives produces a negative income change, the other two corrections must account for more than 100 percent of the overall positive change. Lastly, column 8 then swaps the remaining four types of survey income for their administrative record counterparts to reinforce that most of the total income change is in fact due to corrections for retirement income misreporting.

Eliminating retirement income false positives somewhat reduces incomes toward the bottom of the income distribution (and raises poverty rates), although the absolute declines are small economically. Replacing true positives also has little impact at the bottom of the income distribution. As incomes rise, intensive margin underreporting becomes more relevant, accounting for 38 percent of the overall income change at the 75th percentile. Across the income distribution, however, it is clear that false negatives are the single largest component of retirement income underreporting.[24] They account for 103 percent of the total change at the 25th percentile and 70 percent of the change at the 75th percentile.[25]

Another way to demonstrate the centrality of the extensive margin is to compare income correlations and rates of receipt across types of income. As shown in Appendix Table 6 the log-log correlation between survey and administrative record retirement income is 0.53, which compares favorably to the correlation for Social Security, 0.56. In other words, retirement income intensive margin reporting is not an outlier. When we instead compare rates of receipt between survey and administrative records for each type of income, we see that for Social Security the two rates are 85 and 86 percent. For retirement income, only 37 percent report any positive amount in the CPS, while the administrative records indicate a rate of receipt of 61 percent. Thus, any explanation for retirement income underreporting must account for why those who receive retirement income frequently fail to report *any* of it in the survey.

V.6. Analysis of False Negative Rates

In Table 6 we consider a variety of demographic, survey design, and administrative record features that could potentially explain false negatives for persons aged 65 and over. We

[24] At the 90th and 95th percentiles, true positives are not statistically significantly less important, however.
[25] In Appendix Table 5, we repeat this analysis removing imputed values of income.

analyze the quality of reports for both retirement and Social Security income. The comparison to Social Security is useful because we have already documented that the survey and administrative record distributions of Social Security income correspond well. Columns 1 through 4 report the fraction of the sample that are true negatives, false positives, false negatives, and true positives, respectively. Columns 5 and 6 summarize overall survey and administrative record rates of receipt, and column 7 calculates the *rate* of false negatives (conditioning on actual receipt).

For Social Security, the overall rates of receipt are 85 percent in the survey and 86 percent in the administrative records, with a false negative rate below 8 percent. This rate remains low across most subgroups. In addition, false positives are roughly as important as false negatives, which explains the close correspondence in overall income receipt rates. In contrast, the overall rates of retirement income receipt are 37 percent in the survey and 61 percent in the administrative records, with a false negative rate of 46 percent. False positives are relatively rare, and as a result, all subgroups appear to have very high rates of underreporting.

There is some demographic variation in retirement income false negative rates, however. For example, women appear to have higher false negative rates than men, 52 percent versus 40 percent. False negative rates are also higher for those with lower levels of educational attainment, 56 percent for high school dropouts versus 40 percent for college graduates.

In considering potential explanations for underreporting, it is important to note, however, that most demographic characteristics are only weakly associated with underreporting. False negatives are 44 percent for those aged 65 to 74, 49 percent for those aged 75 to 84, and 50 percent for those aged 85 and over. If, for example, cognitive decline was largely responsible for underreporting, we might have expected a higher age gradient in false negatives. Disability status also does not appear to hinder reporting, with false negative rates of 44 percent for the disabled and 47 percent for the non-disabled. Lastly, survivor income received is not worse reported than other types of retirement income, as widows have a false negative rate of 46 percent while the rate is 48 percent for married persons.

CPS survey design features and processes are also of limited help in explaining underreporting. Householder status (typically indicative of the interview respondent) and the interview month-in-sample cannot explain underreporting.[26] Imputed observations do have higher rates of false negatives than actual reports (60 percent versus 44 percent), but they also have higher rates of false positives, so that the overall rates of survey and administrative record receipt do not vary much by imputation status. In Appendix Table 7, we show evidence of similar patterns of retirement income underreporting in the linked sample of the 2013 American Community Survey (ACS). Unlike the CPS, the ACS is a mandatory survey with a distinct paper/internet questionnaire that is usually completed by the household without the assistance of

[26] Typically, interviews occurring in sample months 1 and 5 are done in-person, while interviews during the other six months are conducted by phone. Krueger et al. (2016) document rising CPS rotation group bias in the unemployment rate.

an interviewer. Evidently, features that are specific to the CPS survey do not make much of a difference as the false negative rate in the ACS is 44 percent.

One set of characteristics that does explain variation in underreporting involves the nature of the 1099-R distributions an individual receives. Specifically, persons with only employer-sponsored distributions have a false negative rate of 40 percent, persons with both employer-sponsored and IRA distributions have a rate of 35 percent, but persons with only IRA distributions have a much higher rate of 81 percent. In other words, IRA distributions are rarely captured by the traditional CPS ASEC questionnaire. This is consistent with the aggregate shortfalls found in the previous literature. Unlike previous work, however, our results suggest that that the CPS ASEC also misses many employer-sponsored distributions received by the aged, which we will argue in section V.10 still predominantly reflect defined benefit/annuity income.

Besides the type of 1099-R distribution, the total amount of the distribution also matters. Persons in the bottom quintile of the total retirement income distribution have a false negative rate of 72 percent while persons in the top quintile have a false negative rate of 31 percent. Figure 2 shows the full monotonic relationship between total 1099-R amount and the likelihood of reporting any retirement income in the survey. While respondents frequently neglect to report small amounts of retirement income, even those with the largest amounts still have substantial false negative rates.

Lastly, the degree of regularity of the 1099-R distribution appears to matter. Those who received 1099-R income in 2012 and experienced a change between 2012 and 2013 greater than 10 percent have higher false negative rates than those with more consistent amounts between years.

We analyze the combined explanatory power of demographics, survey design, and administrative record features within a regression framework. Specifically, for all persons aged 65 and over who receive 1099-R income, we estimate a linear probability model for survey retirement income receipt:

$$y_i = \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i$$

In the above model, y_i is an indicator for survey receipt, X_{1i} is a vector of demographic characteristics, X_{2i} is a vector of survey design features, and X_{3i} is a vector of 1099-R attributes. The results are shown in Table 7. Even after controlling for other demographic characteristics, we observe higher false negative rates for women and for the less educated. The R^2 indicates that all demographic variables explain only 6 percent of variation in false negative rates. Adding survey design features raises the R^2 to 7 percent. The model indicates that observations with imputed retirement income do have higher false negative rates, but as noted earlier, imputations also produce higher false positive rates. Adding administrative record features further boosts the R^2 to 21 percent, primarily as a result of controlling for whether a person receives only IRA

(omitted category), only employer sponsored, or both types of 1099-R distributions. The coefficients on "only employer sponsored" and "both types" are both economically large, indicating that the real decline in reporting accuracy comes from having only IRA withdrawals. Thus, even after controlling for other factors, IRA distributions are clearly an important reason that retirement income is underreported in the CPS ASEC. Still, much of what drives retirement income underreporting remains unexplained by the model.

V.7. Missing Defined Benefit Income

Given our regression results, there is reason to suspect that underreporting is not limited to withdrawals from defined contribution accounts. To further illustrate this, we produce statistics on four large public-sector pension plans which are known to be traditional defined benefit plans. Appendix Table 8 shows survey responses in our linked sample for aged persons who receive a 1099-R distribution from the Federal Civil Service Retirement System (CSRS), the Military Retirement Fund, the California Public Employees Retirement System (CalPERS), and the California State Teachers' Retirement System (CalSTRS). We observe false negative rates from 14 to 25 percent for all four types of annuitants, even after removing imputed survey values. These false negative rates are lower than the overall rate for employer-sponsored distributions, but they are still substantial and higher than the false negative rates for Social Security, the other main source of annuity income. Moreover, as shown in the table, the presence of defined benefit false negatives meaningfully alters the median income and poverty rate statistics for these annuitants. Evidently, even distributions that clearly satisfy the criteria of money income are missing at a fairly high rate from the CPS ASEC.

V.8. Discussion of Alternative Explanations

The analysis thus far takes the administrative records as the "truth" and evaluates the quality of the survey in relation to this benchmark. Tax records are generally believed to be of high quality with little incentive for overreporting retirement incomes, although measurement error is still possible (Abowd and Stinson, 2013). In our case, the main concern is that certain 1099-R distributions that we intend to exclude from our definition of retirement income might still be present in our extract. Although distributions such as direct rollovers are supposed to be excluded, we lack the specific distribution codes on our file to directly confirm this happens.[27] Instead, we compare our aggregate numbers to those found in Argento et al. (2015) in Appendix Table 9. With access to more detailed tax data, Argento et al. are able to categorize various types of 1099-R aggregates for a representative sample of filers aged 55 and over in 2010. We produce analogous statistics in our linked sample for the same year and find a high degree of alignment

[27] We have, however, worked closely with Kevin Pierce at SOI to understand how the 1099-Rs are processed in preparing our extract. We have also obtained the logic code used to determine which types of distributions are excluded from our extract. All of the available evidence suggests that most distributions that should not be considered income are in fact removed. In addition, we have been provided with unpublished tabulations that demonstrate that duplicate and amended 1099-Rs are extremely rare. Even if present on occasion, these could not explain the high rate of false negatives in the CPS ASEC.

with their numbers.[28] We have also compared age-unrestricted aggregates from our linked sample to published SOI totals for various years. In general, our 1099-R aggregates are somewhat above the taxable amounts but well below total amounts reported by SOI. This is as expected given the lack of (non-taxable) direct rollovers on our file. Lastly, the fact that we find consistent evidence of underreporting among all aged subgroups, including those aged 85 and over, strongly suggests that infrequent types of distributions related to employment transitions cannot be driving our results.

Another potential concern is the quality of the linking between the survey and the administrative records. There are several reasons why this is unlikely to explain our results. First, we observe a close correspondence between survey and administrative record measures of earnings and Social Security via the same linking process. Second, while the false negative rate is high for retirement income, false positives remain quite rare. Third, intensive-margin correlations for retirement income look reasonable. Fourth, as shown in Figure 5 (discussed in detail in Section V.9), there is no evidence of a discontinuous change in administrative record receipt surrounding a fundamental change in the Census Bureau's PIK assignment process, beginning with survey year 2006.[29] Thus, multiple forms of linkage produce the same findings.

Even though the administrative records and data linkages appear to be of high quality, one might still be concerned about the treatment of certain 1099-R distributions as income. Perhaps individuals receive one-time lump-sum distributions that inflate incomes in the current year but are not indicative of long-run economic status. To assess this possibility, we examine fluctuations in retirement income across the age distribution between 2012 and 2013. As shown in Appendix Table 10, there is a 96 percent chance among the aged of receiving an employer-sponsored 1099-R in 2013 conditional on receiving one in 2012. The amount of income received is also relatively steady, with 81 percent experiencing a change in amount between the two years of less than 10 percent and 9 percent actually receiving an increase greater than 10 percent. Thus, only 10 percent experience a decrease in amounts greater than 10 percent. For younger age groups, distributions are much more likely to be one-time events. IRAs also have a high rate of consecutive year receipt among the aged, at 92 percent. This is in part because of Required Minimum Distribution (RMD) rules that begin at age 70 ½. The amounts withdrawn, however, are quite volatile—46 percent experience a change in the amount of less than 10 percent, 31 percent receive an increase greater than 10 percent, and 23 percent experience a decrease greater than 10 percent. Given that 50 percent of the aged receive employer-sponsored distributions,

[28] More specifically, we start with Argento et al. gross distributions for those aged 55 and over and subtract direct rollovers, Roth conversions, and Section 1035 exchanges, which are three types of distributions we wish to exclude form our definition of retirement income. Our weighted total is 97.5 percent of their remainder. We have also repeated this exercise using unpublished tabulations produced by Argento et al. for those aged 65 and over and find essentially the same result. One type of distribution we wish to exclude from our extract but cannot is the indirect rollover; however, Argento et al. show that indirect rollovers are only 2.8 percent of aggregate gross distributions for those aged 55 and over.

[29] The current PVS process used to assign PIKs to CPS ASEC participants was implemented in survey year 2006. See Wagner and Layne (2014) for more details on the PVS process.

while only 29 percent receive IRA distributions, it is not surprising that the results from examining all 1099-R distributions more closely resemble the employer-sponsored results. Thus, as of 2012, retirement income is still mostly a recurring and steady source of income for the aged.

Lastly, one can acknowledge that 1099-R distributions represent real resources for the aged that are frequently missed by the survey, but still object to classifying them as income. As discussed earlier, defined contribution account withdrawals pose a challenge to the traditional CPS ASEC concept of money income and can instead be viewed as a form of dissaving. Others would argue that including the withdrawals in income would be "double-counting," to the extent that part of the distributions originated as employee contributions that would have been included in wages during working years. On the other hand, we have already demonstrated that many employer-sponsored distributions including those paid out by traditional defined benefit plans are also underreported, even though they unambiguously represent money income. As we will argue in Section V.10, defined benefit distributions in 2012 are still the dominant form of retirement income of the aged. Also, to the extent that the aged do make withdrawals from defined contribution accounts, these withdrawals also reflect past employer contributions as well as accrued interest, dividends, and capital gains. These amounts were never included in survey income during working years and are therefore missing rather than double-counted. Lastly, some would argue that it is challenging to use a pure, money-income poverty measure in an environment where future cohorts are more likely to depend exclusively on as-needed withdrawals from defined contribution accounts. Starting with the CPS ASEC redesign in 2014, the Census Bureau now asks specific questions about retirement account withdrawals and counts those withdrawals, even if irregular, as income.[30]

V.9. Reassessing Trends

Is underreporting a recent phenomenon or part of a longer-term trend? To address this question, we extend our comparisons of survey and administrative record income back a quarter century and reassess trends in income, poverty, and retirement income receipt.

Figure 3 plots trends in the 25th, 50th, and 75th percentile of household income between 1990 and 2012. The results are shown for householders aged 65 and over, as well as for three aged subgroups—65 to 74, 75 to 84, and 85 and over. All dollar amounts shown are inflation adjusted using the CPI-U-RS and are expressed in 2012 dollars. In 1990, median incomes were 20 percent higher in the administrative records than in the survey, indicating that underreporting was certainly important in earlier years, although smaller in magnitude than in 2012. As a result, the CPS ASEC shows a median income growth rate between 1990 and 2012 of 18 percent, while the administrative records show a higher growth rate of 29 percent. The survey also suggests income growth rates of 19 and 22 percent at the 25th and 75th percentiles, while the

[30] The CPS ASEC also now includes, as of 2016, questions regarding retirement plan contributions.

administrative records indicate growth rates of 31 and 32 percent, respectively. These findings are qualitatively similar for each of the aged subgroups.

Figure 4 plots trends in poverty rates between 1990 and 2012. Even at the start of our series, we observe substantial differences in measured poverty among the aged. The survey shows a poverty rate of 12.2 percent in 1990 compared to the administrative record rate of 9.7 percent. Large discrepancies are also found for each aged subgroup, including a 4.6 percentage point difference for those aged 85 and over.[31] Unlike the income series, there is no clear difference in poverty trends over time; instead, the administrative records shift the level of poverty downward in all years.

Figure 5 demonstrates the role of retirement income in accounting for the revised income and poverty series. Remarkably, the CPS ASEC Full Sample shows no evidence of any rise in retirement income receipt with a 40 percent rate in 1990 and a 36 percent rate in 2012. In contrast, the administrative records show retirement income receipt growing from 45 to 61 percent. For comparison purposes, we also plot Social Security income receipt in Figure 5. In all years, there are only minor differences in reported and actual Social Security receipt.

Our results demonstrate that underreporting is not a new phenomenon among the aged. It existed before most of the rise in unit- and item-nonresponse rates across household surveys documented by Meyer et al. (2015). Income underreporting among the aged in 1990 is also too early to be attributed to 401(k)-type plans. These plans had only recently been adopted, allowing too few years for most retirees in 1990 to have accumulated much savings in them.

V.10. Static Implications

Since 1976, the Social Security Administration has regularly published its *Income of the Aged* series based on data from the CPS ASEC.[32] This series summarizes the overall economic well-being of the aged as well as the sources of income on which they rely. In this section, we argue that correcting for survey income underreporting changes the relative importance of different sources of income across the income distribution and meaningfully alters the findings of *Income of the Aged*. In particular, we show that often-cited statistics on the fraction of the aged who are reliant on Social Security for most of their income are inflated.

Panel A of Table 8 compares 2012 survey and administrative record measures of retirement income across the income distribution. Panel B repeats the same analysis for Social Security income. Following SSA's methodology, we focus on *aged units* which are either single individuals aged 65 and over or married couples with husbands aged 65 and over. Aged units are sorted based on their total incomes and grouped into deciles. The top half of the table sorts by

[31] Interestingly, poverty rates do rise with age in the 1990 cross-section in both the survey and administrative records. In the CPS ASEC, poverty rates rise from 9.7 percent (aged 65 to 74) to 14.9 percent (aged 75 to 84) to 20.2 percent (aged 85 and over). In the CPS Linked Sample, the rates are 8.1, 11.5, and 15.6 percent, respectively.
[32] For example, see Social Security Administration, 2014.

survey income while the bottom half sorts by administrative record income.[33] For each decile, we report rates of receipt as well as unconditional and conditional mean amounts. We also develop a novel methodology that enables us to further divide 1099-R retirement income into defined benefit, IRA, and employer-sponsored defined contribution categories.[34]

The results confirm that retirement income receipt is much more prevalent than the CPS ASEC suggests, throughout the age-unit distribution. For example, in the fifth decile (sorted by administrative record income), 48 percent of aged units have retirement income according to the survey, while 82 percent have retirement income in the administrative records. Defined benefit income is the most prevalent type of retirement income at 65 percent, followed by IRAs at 36 percent, and other defined contribution at 4 percent. Conditional on receipt, the average annual defined benefit amount is $11,100, while the average IRA and other defined contribution amounts are $5,100 and $3,600, respectively. Overall, Panel A of Table 8 shows that as of 2012, defined benefit income remains the most important source of retirement income for the aged.[35] In fact, there is considerably more 1099-R defined benefit income than there is *total* retirement income reported in the survey.[36] In contrast, Panel B of Table 8 shows that the survey captures both the receipt and amounts of Social Security income very well.

Table 9 illustrates how misreporting affects the shares of income derived from each income source. The top panel uses survey-based income to sort aged units into deciles and to calculate income shares, while the bottom panel uses the administrative records.[37] In the CPS ASEC, Social Security's share of income is overstated outside the top deciles of the income distribution. In the lowest decile, this is mainly due to confusion between Social Security and SSI—Social Security's share falls from 69 percent in the survey to 55 percent in the administrative records, while SSI's share rises from 13 percent to 30 percent. Outside the tails of the distributions, the underreporting of retirement income inflates Social Security's income

[33] The results sorted by survey income may be particularly useful to outside researchers who would like to impute additional retirement income to the CPS ASEC.

[34] For full details on this procedure, please see the Method Appendix. In brief, our universe 1099-R extract allows us to separate IRAs from employer-sponsored distributions, but it does not provide any additional information about the types of employer-sponsored distributions. Some of these distributions represent withdrawals from defined contribution plans such as 401(k)s, while others are annuity payments from defined benefit plans. We develop a methodology for employer-sponsored plans that exploits Required Minimum Distribution (RMD) rules which we argue should create large changes in the total number of 1099-Rs a given plan issues to recipients between ages 69 and 71. Employer-sponsored plans with large changes are categorized as defined contribution (where the RMD rules are most likely binding) while others are categorized as defined benefit. We then apply these results to our linked sample.

[35] To the extent that some IRA distributions reflect past amounts that were cashed out of defined benefit plans and rolled over, we may be understating the amount of retirement income that originated in defined benefit systems.

[36] We discuss further implications of missing defined benefit income in Section V.7.

[37] The income shares are calculated for each aged unit and are averaged over all aged units within each decile. Thus, each aged unit has equal weight in calculating the average income share. An alternative approach would be to sum each type of income across all age units within a decile and divide by total income within that decile. The resulting income shares would place greater weight on aged units with higher incomes within each decile.

share.[38] In the fifth decile, for example, Social Security's share falls from 72 percent to 53 percent while retirement income's share rises from 16 percent to 29 percent. Unlike the change in shares in the bottom decile, the change in the fifth decile does not simply reflect a misclassification of income—the average total income in the fifth decile is 30 percent higher in the administrative records than in the survey. Lastly, retirement income is also underreported at the top of the distribution, but its main effect is to distort the earnings share rather than the Social Security share. In the top decile, the earnings share falls from 47 percent to 35 percent, while the retirement income share rises from 19 percent to 34 percent.[39]

In light of the above changes in measured income shares, we reassess several commonly cited statistics related to Social Security. Based on the 2012 edition of the *Income of the Aged Chartbook*, it is reported that 65 percent of aged units who are Social Security beneficiaries derive at least half of their incomes from Social Security, while 36 percent derive at least ninety percent of their incomes from Social Security. In Table 10, we instead find using the linked sample that 50 percent derive at least half of their incomes and 18 percent derive at least ninety percent of their incomes from Social Security.[40]

Other analyses, including those by the U.S. Census Bureau, have described the number of people lifted out of poverty by Social Security (DeNavas-Walt et al., 2013). In these studies, income from Social Security is removed from total income and poverty status is recalculated. The difference between the new and standard poverty measure is described as Social Security's impact on poverty.[41] In Table 11, we perform this exercise using both survey and administrative record values for persons aged 65 and over. Similar to previous work using the CPS ASEC, we estimate that Social Security lifted 15 million aged persons out of poverty in 2012, reducing the poverty rate by 35 percentage points.[42] When we instead use the administrative records, we find an impact that is one-third smaller—10 million aged persons were lifted out of poverty, which reduced the poverty rate by 24 percentage points. Social Security's impact, while still substantial, is lower than previously thought because we have now accounted for the fact that other sources of income are underreported. For comparison purposes, we also consider the number of people lifted out of poverty by each of the other four income sources. None of the other sources of

[38] Specifically, three statistically significant comparisons hold for at least the third through the seventh deciles: the Social Security share is lower in the administrative records than in the survey, the retirement share is higher, and the total income is higher.

[39] In Appendix Table 11, we repeat the income share analysis for aged units 75 and over. At age 75, almost all of the aged who are eligible for Social Security will have claimed. Moreover, for those who have retirement accounts, they will be subject to the RMD rules at this age, generating observed distributions from these accounts. Nevertheless, the results confirm our findings in Table 9.

[40] Dushi et al. (2017) find consistently higher reliance on Social Security income across three surveys—the CPS ASEC (both pre- and post-redesign), the SIPP, and the HRS. This suggests that income underreporting among the aged may be widespread across household surveys.

[41] This calculation assumes no behavioral response and does not take into account the effect of FICA taxes on earnings.

[42] Small differences between published estimates and those presented here are the result of our use of the subsample of persons assigned a PIK.

income, including retirement income, have nearly as large an impact on poverty, whether we use the survey or the administrative records. Social Security goes a long way toward lifting the aged out of poverty, and leaves less room for each of the other income sources to make a substantial difference in this calculation.

V.11. Dynamic Implications

The results thus far suggest that incomes of the aged are higher than previously thought. We would also like to know to what extent living standards are maintained as people transition from work to retirement. To address this question, we conduct a synthetic cohort analysis by pooling many years of linked samples together. We choose this approach over a traditional panel because it is the only way to have a side-by-side comparison of survey and administrative record income measures over multiple years.[43] This approach also allows us to observe living arrangements for comparable individuals across years and therefore estimate changes in poverty rates over time.

The major concern with a standard synthetic cohort approach is that sample compositional changes may bias estimates. In particular, when examining individuals at older ages, the samples will become increasingly advantaged over time to the extent that higher socioeconomic status individuals tend to live longer. We mitigate these concerns by making use of date of death information in our linked samples.

Specifically, in each CPS ASEC cross section, we select individuals for our sample who first claimed Social Security between 2003 and 2007, were aged 60 to 70 when first claiming, did not claim Social Security disability benefits, and lived at least five years after claiming. With the use of the administrative records, this sample definition is implemented consistently in each year of CPS ASEC data. Analysis of pre-determined demographic characteristics such as gender, educational attainment, and race suggest the samples are well-balanced over time.

We construct an 11-year window spanning five years before Social Security is claimed to five years after claiming. For individuals who first claimed in 2003, the 2004 CPS ASEC is used to measure incomes at year zero, the 2005 survey is used to measure incomes at year 1, etc. For individuals who first claimed in 2004, the 2005 CPS ASEC is used to measure incomes at year zero, the 2006 survey is used to measure incomes at year 1, etc. In all, we use the 1999-2013 linked samples to cover the 11-year window. This means we pool five survey years together at each point in time (t-5,…,t+5) consisting of all individuals claiming between 2003 and 2007.

The analysis is conducted at the individual level. If, however, a sample member is married, we assign to that person the pooled incomes of the married couple and equivalence adjust using the standard Betson Scale described in Short (2015).[44] When analyzing poverty, we

[43] Studies such as Banks et al. (1998) also examine the retirement consumption puzzle using synthetic cohorts.
[44] Note that based on our sample restrictions, a married sample member may or may not have a spouse that is also a sample member.

follow the standard procedure of pooling all resources of the family together and compare to the relevant poverty threshold. All income amounts are inflation adjusted using the CPI-U-RS and expressed in 2012 dollars.

There is one additional aspect of our analysis that is longitudinal in nature. For sample members in the survey five years before claiming, we make use of the full uncapped earnings histories received from SSA, dating back to 1978. This allows us to calculate (real) long-run earnings as averages of the last 5, 10, 15, 20, and 25 years of earnings prior to claiming Social Security and compare these long-run measures to incomes in retirement.[45] For those who are married five years before claiming, we pool both spouses' long-run earnings together and equivalence adjust. We then average the resulting long-run earnings measures for individuals near specified percentiles of income. For example, for comparisons to median income, we take the average of long-run earnings for sample members with incomes between the 45th and 55th percentile. This gives us a sense of what average career earnings look like for individuals with incomes near the median.

Table 12 describes survey and administrative record trends in equivalized income and poverty over the 11-year window. The first panel shows results for the full population while the second and third panels repeat the analysis for women and men, respectively. We discuss the results for the full population. The general pattern is that five years prior to claiming, the two measures of income correspond fairly well but diverge in the following years. For example, median incomes are $51,000 in the survey and $53,000 in the administrative records five years before claiming. In the ensuing years, incomes diverge. By the end of the sample window, the median has fallen by 35 percent in the survey but only 21 percent in the administrative records.[46] In other words, the transition to retirement appears to be less abrupt after adjusting for income underreporting. Similar patterns are observed at the 25th and 75th percentiles. Our income trends are broadly in line with Brady et al. (2017) who examined the retirement transition for a sample of tax filers over a five-year period. The authors note that after-tax income declines more slowly

[45] This exercise is designed to get a sense of the average career earnings for people with incomes near the 25th, 50th, and 75th, percentiles of income in retirement. We fully recognize this exercise is different in many respects from a standard "replacement rate" calculation. For example, a replacement rate analysis would examine the distribution of income to earnings ratios for various long-run earnings profiles as well as incorporate taxes and many other features, as done in Munnell and Soto (2005) and Biggs and Springstead (2008). This is beyond the scope of the current paper, but we hope to return to it in future work with more comprehensive data.

[46] In Bee and Mitchell (2016) we examined in a panel setting the incomes of women after claiming Social Security and did not observe a fall in median incomes. There are many differences between the previous analysis and the one in this paper. To name just a few: the previous analysis selected a sample from a single cross-section of the 2008 SIPP panel and followed the sample over time using only the five administrative record sources. The sample consisted of women who were householders or spouses of householders only rather than the full population. In the case of married women, the sample restrictions (year of claiming, age of claiming, no receipt of SSDI) were defined at the couple level rather than the individual and the unit of analysis was the couple. In addition, we have found in very preliminary analysis that the linked SIPP sample is somewhat more advantaged than the linked CPS-ASEC samples. All of these factors help explain differences in the two sets of results.

than pre-tax income because taxes tend to fall in retirement.[47] Therefore, if we had access to an after-tax measure of income, it is likely that our estimated declines would be even smaller.

Beyond pre- and post-retirement income comparisons, we can also examine incomes in retirement relative to various measures of long-run earnings. Earnings tend to decline in the final years before claiming as workers cut back on hours, so any comparison will be sensitive to how many years of earnings are examined.[48] Retirees with incomes near the median have a 5-year equivalence-adjusted earnings average of $37,000 and a 25-year average of $47,000. Note that the median income five years after claiming is $42,000. The 25th and 75th percentile income retirees also have incomes five years after claiming that compare favorably to long-run earnings.

We also examine how the proportion of the sample with incomes below 100, 200, and 300 percent of the poverty threshold evolves over time. There is no evidence that poverty is rising over time in either the survey or the administrative records. When examining 200 percent of poverty, the two measures diverge sharply. The proportion of the sample under 200 percent of poverty rises by 9.8 percentage points in the survey but only by 2.3 points in the administrative records. For 300 percent, it rises by 16.5 points in the survey but only by 4.3 points in the administrative records. Clearly, income underreporting affects how we view changes in deprivation after retirement.

The literature on the retirement consumption puzzle has focused on understanding the drop in expenditures immediately after retirement with a particular emphasis on food expenditures. Much less attention has been devoted to understanding incomes surrounding retirement. Yet the premise of the puzzle is that the retirement transition provides a useful setting to test the lifecycle hypothesis because incomes are falling substantially and predictably, at least for those who do not retire due to adverse health shocks. Using survey measures, we do observe large drops in incomes, but the administrative records show more modest and gradual declines that begin several years before retirement. Further, when examining incomes after claiming, the administrative record measures remain quite high relative to average long-run earnings, which arguably serves as a better proxy for permanent income. These findings are at odds with well-known studies such as Bernheim et al. (2001) which found a 14 log point drop in consumption immediately after retirement, with the largest declines for low-income groups. They also calculated typical "income replacement rates" of just 60 percent looking three years pre- and post-retirement. This raises the possibility that the examination of the retirement consumption puzzle in other household surveys may also be biased by income underreporting.[49] Our administrative record analysis also shows no increase in poverty rates and very gradual increases

[47] Specifically, Brady et al. (2017) find a decline in average pre-tax income of 15.7 percent between one year before claiming and three years after claiming. Over the same period, the after-tax decline is 7.6 percent.
[48] These earnings measures include years with zero earnings in part to illustrate the difference between a five-year and 25-year average.
[49] There are of course other possible explanations. For example, Bernheim et al. (2000) examined a cohort who retired in the 1980s who may have been less well prepared for retirement.

in the proportion of people below 200 percent and 300 percent of poverty. We view these findings as incompatible with the notion that food consumption would decline precipitously at retirement.

While our 11-year window provides a useful timeframe for reexamining the retirement consumption puzzle, it is not well-suited for understanding living standards many years after retirement. We are therefore unable to address with the available data whether retirees will "run out of money." However, we can say from our earlier cross-sectional analysis in Tables 2 and 3 that median incomes are substantially higher and poverty substantially lower using the administrative records rather than the survey for those aged 85 and over. Whether this will continue to be the case for future cohorts remains to be seen.

VI. Conclusion

Our analysis demonstrates that retirement income underreporting meaningfully affects the measurement of median incomes and poverty rates for older Americans. While IRA withdrawals are mostly missing from the traditional CPS ASEC, it is also noteworthy that defined benefit retirement income is also underreported and remains an important resource for the aged through 2012. These findings, in turn, affect the relative importance of other sources of income, including Social Security.

The most immediate paths for future research include evaluating the redesign of the CPS ASEC using linked data and testing alternative survey strategies for better capturing retirement income. While we emphasize that our results cannot easily be extrapolated to future cohorts, we hope in future work to develop better forecasts of retirement readiness using earnings and saving histories. We also hope to revisit our analysis of retirement transitions in order to calculate formal replacement rates as well as follow individuals many more years into retirement. All of these projects depend upon the continued availability of administrative record data from other federal agencies. We hope this paper demonstrates the value of such data.

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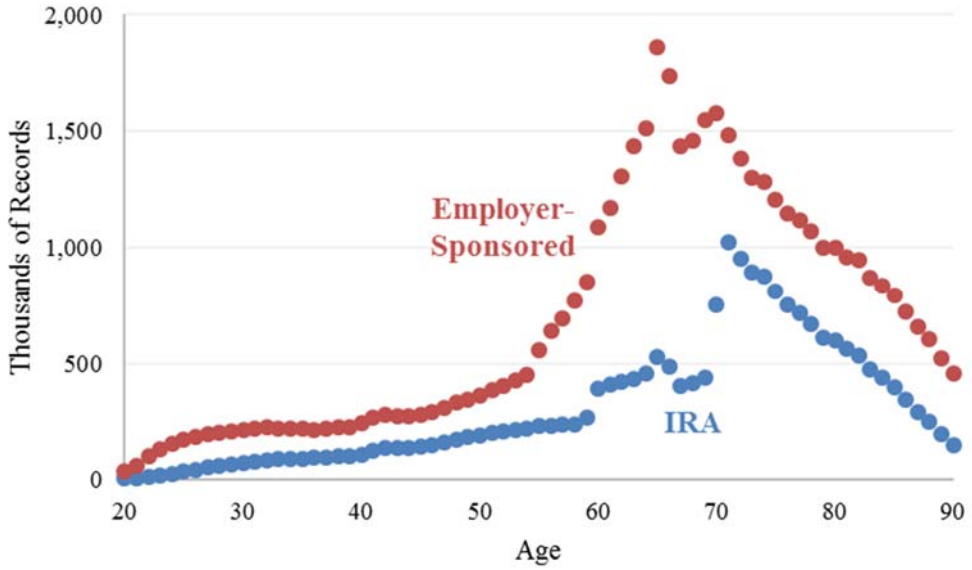
Methods Appendix

In this appendix, we discuss our procedure for assigning defined benefit and defined contribution status to 1099-R employer-sponsored retirement income in tax year 2012. IRS Form 1099-R includes an indicator for IRA distributions. There is no direct way, however, to distinguish distributions from different types of employer-sponsored plans. Given there are approximately 100,000 employer-sponsored plans in our file, we develop an automated procedure to classify plans based on observed responsiveness to Required Minimum Distribution (RMD) rules. RMD rules require plan participants to begin taking distributions representing a minimum percentage of assets at age 70 ½. Our underlying assumption is that RMD rules are effectively binding for defined contribution plans but not for defined benefit plans.[50]

We begin with the Census Bureau's universe 1099-R extract which contains a record for each distribution an individual receives, a plan sponsor tax identifier, the amount of the distribution, and whether or not the distribution is from an IRA.[51] We link this file to SSA Numident file to obtain each recipient's age as of 2012. The figure below displays the total number of 1099-Rs issued by recipient age, separately for IRAs and employer-sponsored plans.

Methods Appendix Figure 1. Number of 1099-Rs by age: 2012



Source: IRS tax year 2012 Form 1099-R records linked to SSA Numident.

[50] Defined benefit plans are also subject to required minimum distribution rules, but they tend to encourage retirement well before age 70 ½. One would therefore not expect sharp changes in the number of distributions near this age. For example, Fitzpatrick (2016) argues that many defined benefit retirement plans incentivize public sector teachers to retire even before they are eligible to receive Social Security. On the other hand, Brown et al. (2014) and Mortenson et al. (2016) provide evidence that RMD rules do affect the timing of distributions from defined contribution plans. Note that any detected effect of RMDs on defined benefit plans would lead us to classify them as defined contribution. This would result in an understatement of the true amount of defined benefit income.

[51] Recall that our universe extract excludes certain types of distributions such as direct rollovers.

While employer-sponsored distributions contain numerous spikes at standard retirement ages, such as age 65, we do not observe in the aggregate that the total number of employer-sponsored 1099-Rs changes discontinuously around age 70 or 71. In contrast, for IRAs, there is a clear jump between age 69 and 70 and again between age 70 and 71. This is exactly what one would expect, given that RMD rules apply to IRA accounts starting at age 70 ½.[52]

While the aggregate results suggest employer-sponsored distributions at older ages mostly do not reflect defined contribution income, we still want to classify distributions at the plan level in order to support our subsequent distributional analysis. We therefore collapse the data to the plan level and for each plan we total the number of 1099-R distributions by single year of recipient age. We then restrict our attention to plans that issued a minimum of 500 1099-Rs to recipients between the ages of 71 and 80. There are roughly 1,000 employer-sponsored plans that meet this criteria in 2012, but they account for the vast majority of employer-sponsored 1099-Rs issued to recipients at older ages.

Our strategy is to estimate an "interrupted age series" regression for each plan to detect whether the total number of 1099-Rs issued to individuals just below the RMD age deviates sufficiently from the trend at ages above the RMD age.[53] As the above figure indicates, the aggregate number of 1099-Rs declines at older ages, as fewer potential recipients remain alive. There also could be cohort effects present if earlier cohorts had fewer participants in certain retirement plans. Regardless, this generates a smooth, negatively sloped trend between ages 71 and 80. If one were to "backcast" the number of 1099-Rs issued at ages 69 and 70 based on the trend between ages 71 and 80, one would expect substantially more distributions than are actually observed at those ages, but *only* for plans with binding RMD rules. Therefore, our assumption is that the larger the negative deviation from trend (equivalently, the fewer 1099-Rs issued at age 69 than expected), the more likely the retirement plan type is defined contribution.

We implement this procedure by estimating a separate regression for each plan. Each regression contains 12 plan-level observations indexing the total number of 1099-Rs issued to recipients aged 69 through 80. We model the (log) number of 1099-Rs issued at each age as a function of a linear trend in age and two indicators variables for ages 69 and 70:

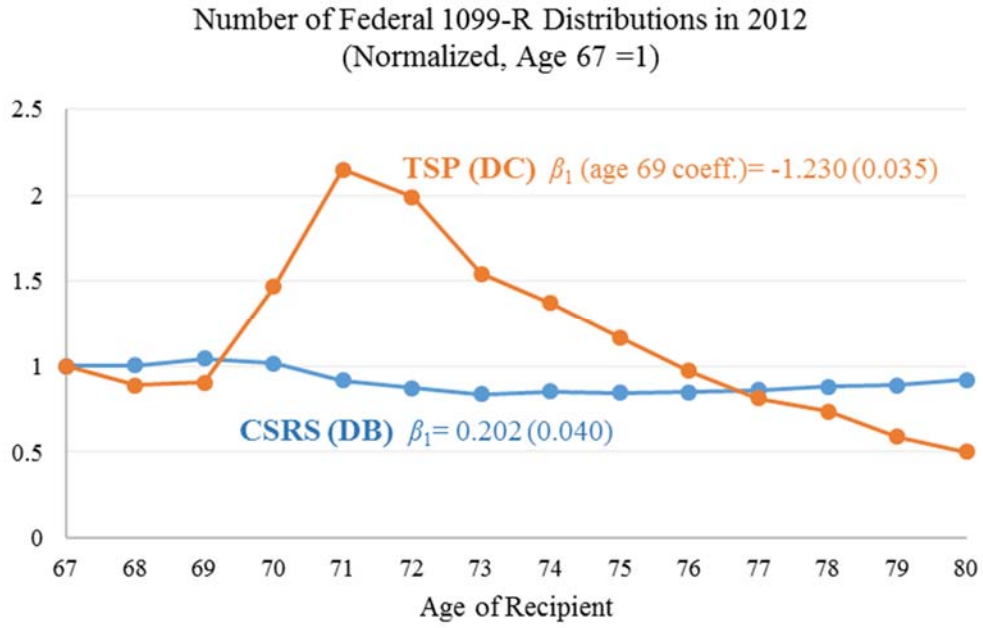
$$y_a = \beta_1 \text{age69}_a + \beta_2 \text{age70}_a + \beta_3 \text{trend}_a + \varepsilon_a$$

We allow separate effects for both ages 69 and 70 but focus on the magnitude of β_1. A more negative β_1 suggests that RMD rules are binding for that particular plan. As a first proof-of-concept, we plot in the figure below the number of 1099-R distributions by age (normalized to 1 at age 67) for two federal plans—the Civil Service Retirement System (CSRS) and the Thrift Savings Plan (TSP). The CSRS is a traditional defined benefit plan that distributes annuity

[52] Roth IRAs are generally excluded from RMD rules.
[53] We choose to estimate the trend based on the number of recipients above the RMD age rather than below because there are other sharp discontinuities by age that occur below the RMD age.

income while the TSP is a defined contribution plan that is similar in many aspects to 401(k) plans in the private sector.

Methods Appendix Figure 2. CSRS and TSP recipiency by age: 2012



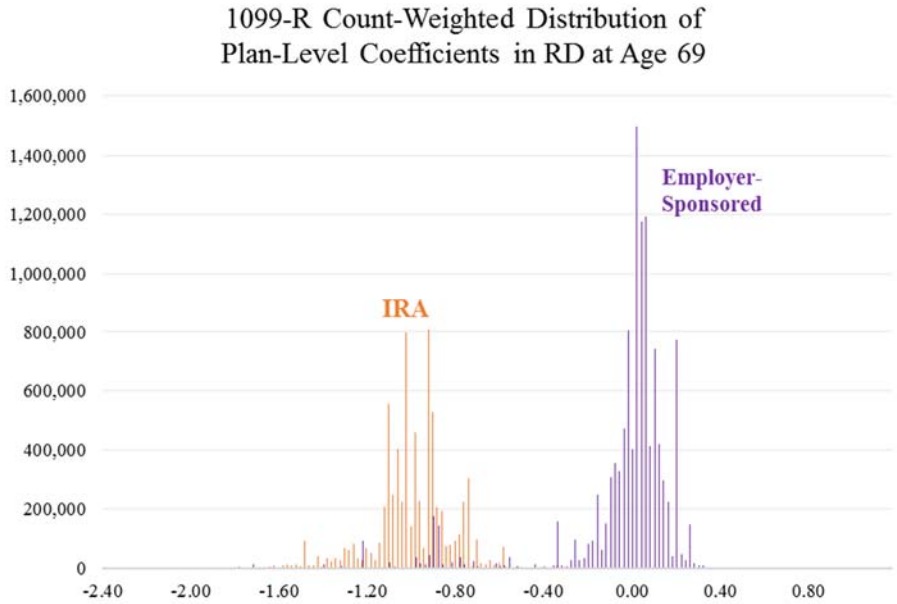
Source: 2013 CPS ASEC linked to IRS Form 1099-R records.

As the figure above indicates, there is little trend in the number of 1099-Rs issued by CSRS across ages. This is consistent with a lack of relevance of RMD rules for defined benefit plans. In contrast, there is a clear jump in the number of 1099-Rs issued by the TSP around the RMD age, which is consistent with its defined contribution status. The estimated equations for both plans reflect the visual evidence.

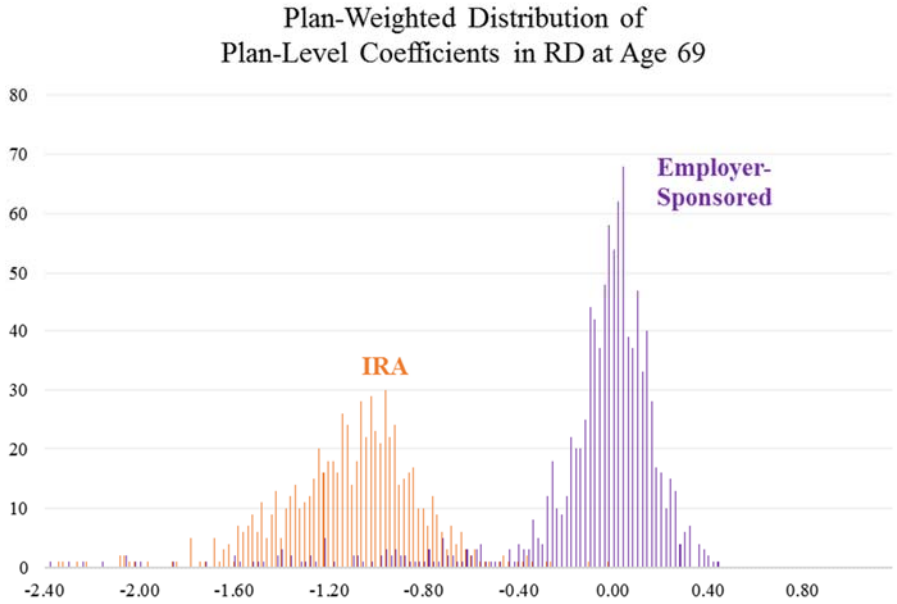
We next plot the distribution of β_1 across all employer-sponsored plans. As a second proof-of-concept we also implement the above regression analysis and estimate β_1 for IRA plans, even though we are primarily interested in classifying employer-sponsored plans. Because IRAs are also defined contribution accounts subject to RMD rules, they serve as a useful validation test of our method. The resulting distributions of β_1 are shown in the two figures below. In the first figure, the distributions are weighted by the underlying number of 1099-Rs issued by the plan between ages 71 and 80, while in the second figure the results are unweighted.

Methods Appendix Figure 3. Coefficients from regression discontinuity at age 69: 2012

Panel A: 1099-R count-weighted



Panel B: Plan-weighted



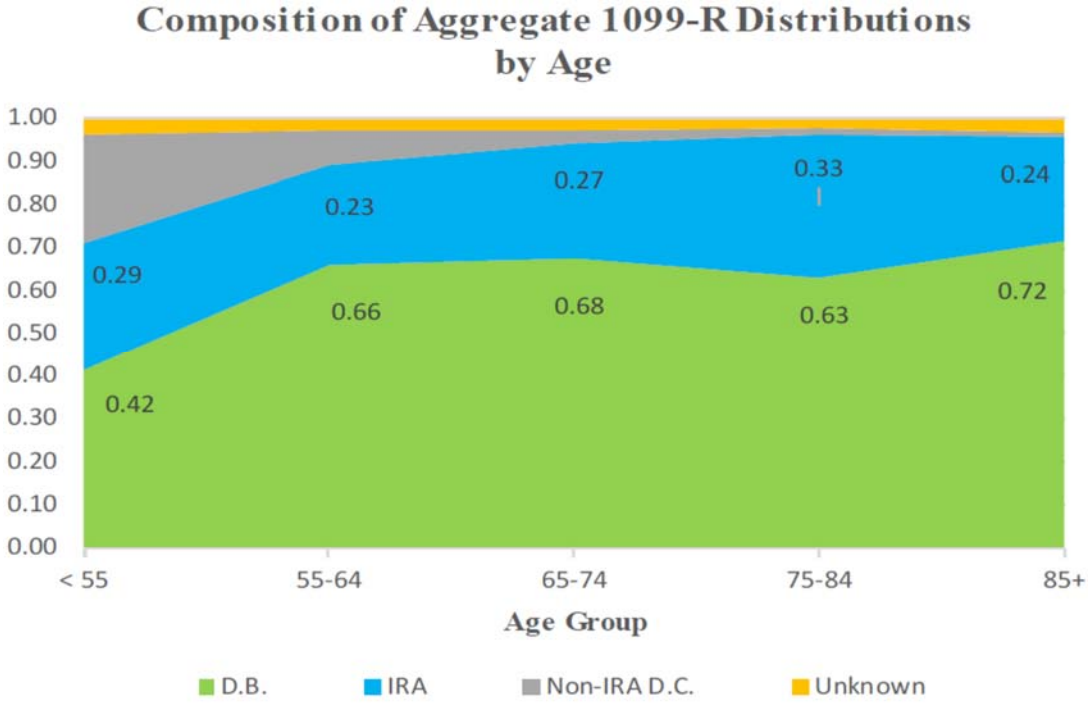
Source: 2013 CPS ASEC linked to IRS Form 1099-R records.

There is little overlap in either figure between the IRA and employer-sponsored distributions of β_1. IRAs overwhelmingly have a strongly negative β_1 with a central tendency of -1.0 (negative 100 log points) weighted and -1.1 unweighted. This indicates they are defined contribution plans. In contrast, the employer-sponsored plans have a distribution of β_1 that centers around -0.04 weighted and -0.1 unweighted with only a small proportion of plans with strongly negative estimates of β_1.

We choose a cutoff value of -0.5 for β_1. That is, employer-sponsored plans with $\beta_1 \leq$-0.5 are classified as defined contribution while all others are classified as defined benefit. If we were to apply this same cutoff to IRAs, we would correctly assign 98.2 percent of IRAs as defined contribution. We also find our subsequent employer-sponsored results to be quite robust to changing the cutoff value to -0.3, in which case 99.4 percent of IRAs would have been correctly classified as defined contribution.

Having assigned each employer-sponsored plan a type, we then link the results from the universe file back to the 2013 CPS ASEC sample and aggregate all types of 1099-R distributions back to the person-level. We report the aggregate shares of four types of 1099-R income—IRA, non-IRA defined contribution, defined benefit, and unknown type—by recipient age group in the figure below. Amounts from an employer-sponsored plan are assigned unknown status if the plan did not issue at least 500 1099-Rs to recipients aged 71 through 80 and was therefore excluded from our regression analysis. While only a small proportion of total employer-sponsored plans were included in the regression analysis, the vast majority of dollars in the linked sample can still be classified because all large plans satisfied our sample selection criteria.

Methods Appendix Figure 4. Composition of aggregate 1099-R distributions by age group: 2012



Source: Tax year 2012 IRS Form 1099-R records linked to SSA Numident.

The results indicate that defined benefit income remains the largest source of aggregate retirement distributions for the aged, as of 2012. It appears that most employer-sponsored defined contribution income is rolled over to IRAs before leaving the tax-preferred universe. However, among those under age 55, aggregate defined contribution distributions (excluding

rollovers) play a larger role. This is consistent with the private sector transition away from defined benefit plans.

Having identified the different types of retirement distributions, we examine how the prevalence of each type varies across the income distribution. We discuss these results in Section V.10 of the main text.

Table 1. Aggregate income estimates by age group: 2012
(In billions, 2012 dollars)

	(1) Full CPS Sample		(2) CPS PIK Sample		(3) Linked CPS-Admin Sample		(4) CPS as % of Admin (2) / (3)	
	Aged 18 to 64	Aged 65 and Over	Aged 18 to 64	Aged 65 and Over	Aged 18 to 64	Aged 65 and Over	Aged 18 to 64	Aged 65 and Over
Earnings	6,659	415	6,651	399	6,633	406	100.3%	98.1%
Social Security	132	517	124	525	150	545	83.1%	96.2%
Supplemental Security Income	36	7	37	7	30	10	123.2%	72.7%
Interest and dividends	158	113	159	116	206	184	77.4%	63.1%
Retirement income	182	279	178	283	396	595	44.9%	47.6%
IRAs (from Form 1099-R)					108	171		
Employer sponsored (from Form 1099-R)					288	424		
Income from all five sources	7,167	1,332	7,149	1,330	7,415	1,740	96.4%	76.4%
Weighted count (thousands of persons)	193,642	43,287	191,930	43,217	191,930	43,217		
N (persons)	122,316	23,446	107,903	21,239	107,903	21,239		

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : The Full CPS Sample (column 1) consists of all CPS persons within one of two age groups—aged 18 to 64 and aged 65 and over—and uses only survey-based values to calculate income aggregates for those two age groups. The CPS PIK Sample (column 2) is a subset of the Full CPS Sample and includes only persons who are assigned a Personal Identification Key (PIK) that allows linking to administrative records, but the CPS PIK Sample continues to use only survey-based values to calculate income aggregates. The Linked CPS-Admin Sample (column 3) is the same set of people as the CPS PIK Sample except administrative record values for each of five types of income have been used to calculate income aggregates. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. CPS ASEC final person weights are used for the Full CPS Sample. For the CPS PIK Sample and the Linked CPS-Admin Sample we adjust the final person weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used for the CPS PIK Sample and the Linked CPS-Admin Sample.

Table 2. Median income of households with householders 65 and over by selected characteristics: 2012

	(1) Full CPS Sample		(2) CPS PIK Sample		(3) Linked CPS-Admin Sample	(4) Admin - CPS Percent Difference (3) - (2)
	Number (thousands)	Median Income	Number (thousands)	Median Income	Median Income	Median Income
HOUSEHOLDERS AGED 65 AND OVER						
All householders aged 65 and over	**27,924**	**33,848**	**27,889**	**34,037**	**44,371**	**30.4%** ***
Type of Household						
Family households	15,066	49,196	15,082	49,375	62,144	25.9% ***
Married-couple	12,418	51,416	12,426	51,614	65,191	26.3% ***
Female householder, no husband present	2,029	37,715	2,044	37,449	44,172	18.0% ***
Male householder, no wife present	619	44,566	613	46,088	55,403	20.2% ***
Nonfamily households	12,858	20,856	12,807	20,954	27,196	29.8% ***
Female householder	8,783	19,192	8,782	19,309	25,201	30.5% ***
Male householder	4,075	25,944	4,024	25,860	31,388	21.4% ***
Race and Hispanic Origin						
White	24,011	34,859	23,994	35,017	45,694	30.5% ***
White, not Hispanic	22,395	35,559	22,363	35,789	46,811	30.8% ***
Black	2,665	25,182	2,634	25,272	32,224	27.5% ***
Asian	790	37,445	797	37,855	47,526	25.5% ***
Hispanic (any race)	1,787	24,122	1,797	23,803	30,016	26.1% ***
Age of Householder						
Aged 65 to 74	15,349	42,343	15,344	42,939	52,118	21.4% ***
Aged 75 to 84	8,861	28,517	8,844	28,566	38,982	36.5% ***
Aged 85 and over	3,714	22,800	3,701	22,875	30,325	32.6% ***
Nativity of Householder						
Native born	25,185	34,316	25,155	34,510	45,114	30.7% ***
Foreign born	2,739	28,318	2,734	28,604	35,838	25.3% ***
Naturalized	2,211	29,666	2,199	30,448	38,232	25.6% ***
Not a citizen	528	24,478	535	23,762	26,663	12.2%
Disability Status						
With a disability	8,875	25,506	8,990	25,676	31,385	22.2% ***
With no disability	19,049	38,844	18,899	39,215	50,878	29.7% ***
Region						
Northeast	5,334	33,281	5,331	33,346	45,467	36.4% ***
Midwest	6,514	34,761	6,525	34,477	44,411	28.8% ***
South	10,283	32,401	10,206	32,650	43,134	32.1% ***
West	5,793	35,996	5,827	36,725	46,236	25.9% ***
Residence						
Inside metropolitan statistical areas	22,507	35,096	22,482	35,304	46,332	31.2% ***
Inside principal cities	7,962	31,572	7,932	31,889	41,391	29.8% ***
Outside principal cities	14,545	36,832	14,550	36,983	48,776	31.9% ***
Outside metropolitan statistical areas	5,417	29,646	5,407	29,761	37,054	24.5% ***
Educational Attainment						
Less than high school diploma	4,676	19,769	4,705	19,917	23,381	17.4% ***
High school graduate	9,242	29,362	9,186	29,514	37,690	27.7% ***
Some college	6,824	36,452	6,827	36,521	47,137	29.1% ***
College graduate	7,182	60,083	7,170	60,700	78,231	28.9% ***

Table 2, continued. Median income of households with householders 65 and over by selected characteristics: 2012

	(1)		(2)		(3)	(4)
	Full CPS Sample		CPS PIK Sample		Linked CPS-Admin Sample	Admin - CPS Percent Difference (3) - (2)
	Number (thousands)	Median Income	Number (thousands)	Median Income	Median Income	Median Income
Marital Status						
Married	12,418	51,416	12,426	51,614	65,191	26.3% ***
Married, spouse absent	393	22,263	392	21,490	25,555	18.9% **
Widowed	9,187	22,083	9,166	22,326	29,474	32.0% ***
Divorced	4,038	25,233	4,037	25,344	30,712	21.2% ***
Separated	376	19,576	370	17,453	20,983	20.2% **
Never married	1,512	25,394	1,497	24,975	32,881	31.7% ***
Housing Tenure						
Homeowner with mortgage	6,037	52,210	5,943	52,670	62,213	18.1% ***
Homeowner without mortgage	16,371	34,328	16,429	34,758	47,087	35.5% ***
Renter	5,516	20,024	5,517	19,737	22,061	11.8% ***
Veteran Status						
Veteran	7,049	44,649	7,081	44,802	56,353	25.8% ***
Not a veteran, male	6,479	41,922	6,413	42,371	52,657	24.3% ***
Not a veteran, female	14,396	26,575	14,395	26,767	35,039	30.9% ***
Household Size						
One person	12,087	19,975	12,102	20,123	26,114	29.8% ***
Two people	12,774	46,529	12,698	46,830	59,716	27.5% ***
Three or more people	3,063	63,596	3,089	63,622	73,649	15.8% ***
Retirement Income Imputation						
Retirement income imputed	4,845	32,843	4,094	32,513	47,789	47.0% ***
Retirement income not imputed	23,079	34,045	23,795	34,275	43,835	27.9% ***
Month in Sample						
MIS 1	3,450	33,180	3,424	33,499	43,238	29.1% ***
MIS 2	3,159	36,183	3,176	36,298	46,306	27.6% ***
MIS 3	3,131	34,917	3,120	34,869	45,638	30.9% ***
MIS 4	3,500	31,665	3,476	32,104	43,552	35.7% ***
MIS 5	4,150	32,716	4,157	32,973	42,642	29.3% ***
MIS 6	3,978	32,412	3,955	32,681	43,240	32.3% ***
MIS 7	2,947	35,809	2,977	35,597	45,358	27.4% ***
MIS 8	3,609	34,351	3,603	34,446	45,611	32.4% ***
N (households)	14,957		13,656			

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : *p<0.10, **p<0.05, ***p<0.01.The Full CPS Sample (column 1) consists of all CPS households with a householder aged 65 and over and uses only survey-based values to calculate median household incomes. The CPS PIK Sample (column 2) is a subset of the Full CPS Sample and includes only householders who are assigned a Personal Identification Key (PIK) that allows linking to administrative records, but the CPS PIK Sample continues to use only survey-based values to calculate median incomes. The Linked CPS-Admin Sample (column 3) is the same set of households as the CPS PIK Sample except administrative record values have replaced the survey values for five types of income: earnings, Social Security, SSI, interest and dividends, and retirement income. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. CPS ASEC final household weights are used for the Full CPS Sample. For the CPS PIK Sample and the Linked CPS-Admin Sample we adjust the final household weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used for the CPS PIK Sample and the Linked CPS-Admin Sample. All median household income calculations use linear interpolation to avoid issues with heaping as done in DeNavas-Walt et al. (2013).

Table 3. People in poverty by selected characteristics, among people aged 65 and over: 2012

(Numbers in thousands.)

	(1) Full CPS Sample			(2) CPS PIK Sample			(3) Linked CPS-Admin Sample		(4) Admin - CPS Difference (3) - (2)	
		Below Poverty			Below Poverty		Below Poverty		Below Poverty	
	Total	Number	Percent	Total	Number	Percent	Number	Percent	Number	Points
PEOPLE AGED 65 AND OVER										
Total	**43,287**	**3,926**	**9.1**	**43,217**	**3,879**	**9.0**	**2,992**	**6.9**	**-887**	**-2.1** ***
Family Status										
In families	29,761	1,593	5.4	29,748	1,586	5.3	1,016	3.4	-570	-1.9 ***
Householder	15,067	826	5.5	15,082	810	5.4	549	3.6	-261	-1.7 ***
Unrelated individuals	13,516	2,332	17.3	13,456	2,292	17.0	1,970	14.6	-322	-2.4 ***
Race and Hispanic Origin										
White	37,039	2,891	7.8	37,008	2,842	7.7	2,156	5.8	-686	-1.9 ***
White, not Hispanic	34,131	2,324	6.8	34,089	2,265	6.6	1,630	4.8	-635	-1.9 ***
Black	3,893	708	18.2	3,855	711	18.4	539	14.0	-172	-4.4 ***
Asian	1,669	205	12.3	1,669	207	12.4	194	11.7	-13	-0.7
Hispanic (any race)	3,213	663	20.6	3,211	670	20.9	613	19.1	-57	-1.8
Sex										
Male	19,298	1,282	6.6	19,264	1,282	6.7	949	4.9	-333	-1.7 ***
Female	23,990	2,643	11.0	23,954	2,596	10.8	2,043	8.5	-553	-2.3 ***
Age										
Aged 65 to 74	24,702	1,960	7.9	24,668	1,937	7.9	1,665	6.7	-272	-1.1 ***
Aged 75 to 84	13,289	1,316	9.9	13,278	1,302	9.8	924	7.0	-378	-2.8 ***
Aged 85 and over	5,296	649	12.3	5,271	640	12.1	403	7.6	-237	-4.5 ***
Nativity										
Native born	38,077	3,078	8.1	38,027	3,035	8.0	2,148	5.6	-887	-2.3 ***
Foreign born	5,211	848	16.3	5,190	844	16.3	843	16.2	-1	0.0
Naturalized	3,877	563	14.5	3,857	559	14.5	544	14.1	-15	-0.4
Not a citizen	1,334	285	21.4	1,333	285	21.4	300	22.5	15	1.1
Region										
Northeast	8,121	760	9.4	8,125	761	9.4	595	7.3	-166	-2.0 ***
Midwest	9,771	664	6.8	9,750	649	6.7	465	4.8	-184	-1.9 ***
South	16,150	1,648	10.2	16,051	1,625	10.1	1,231	7.7	-394	-2.5 ***
West	9,245	853	9.2	9,291	843	9.1	701	7.5	-142	-1.5 **
Residence										
Inside metropolitan statistical areas	35,120	3,159	9.0	35,044	3,109	8.9	2,303	6.6	-806	-2.3 ***
Inside principal cities	12,077	1,506	12.5	12,001	1,490	12.4	1,219	10.2	-271	-2.3 ***
Outside principal cities	23,043	1,653	7.2	23,043	1,618	7.0	1,084	4.7	-534	-2.3 ***
Outside metropolitan statistical areas	8,167	767	9.4	8,173	770	9.4	689	8.4	-81	-1.0 *
Disability Status										
With a disability	13,301	1,727	13.0	13,520	1,735	12.8	1,466	10.8	-269	-2.0 ***
With no disability	29,987	2,199	7.3	29,697	2,144	7.2	1,526	5.1	-618	-2.1 ***
Educational Attainment										
Less than high school diploma	7,547	1,526	20.2	7,560	1,539	20.4	1,374	18.2	-165	-2.2 ***
High school graduate	15,120	1,295	8.6	15,081	1,295	8.6	889	5.9	-406	-2.7 ***
Some college	9,675	600	6.2	9,679	589	6.1	443	4.6	-146	-1.5 ***
College graduate	10,945	504	4.6	10,899	457	4.2	285	2.6	-172	-1.6 ***

Table 3, continued. People in poverty by selected characteristics, among people aged 65 and over: 2012

(Numbers in thousands.)

	(1)			(2)			(3)		(4)	
	Full CPS Sample			CPS PIK Sample			Linked CPS-Admin Sample		Admin - CPS Difference (3) - (2)	
		Below Poverty			Below Poverty		Below Poverty		Below Poverty	
	Total	Number	Percent	Total	Number	Percent	Number	Percent	Number	Points
Marital Status										
Married	24,518	1,075	4.4	24,473	1,066	4.4	596	2.4	-470	-1.9 ***
Married, spouse absent	528	126	23.8	514	128	24.9	110	21.4	-18	-3.6
Widowed	11,064	1,502	13.6	11,056	1,460	13.2	1,181	10.7	-279	-2.5 ***
Divorced	4,796	729	15.2	4,801	724	15.1	659	13.7	-65	-1.4
Separated	478	119	24.8	481	132	27.5	127	26.5	-5	-1.1
Never married	1,903	376	19.8	1,893	368	19.4	318	16.8	-50	-2.6 *
Housing Tenure										
Owner households with mortgage	10,838	493	4.5	10,653	485	4.6	325	3.1	-160	-1.5 ***
Owner households without mortgage	25,099	1,900	7.6	25,248	1,838	7.3	1,102	4.4	-736	-2.9 ***
Renter households	7,350	1,533	20.9	7,316	1,555	21.3	1,564	21.4	9	0.1
Veteran Status										
Veteran or Armed Forces	9,680	429	4.4	9,693	425	4.4	231	2.4	-194	-2.0 ***
Not a veteran, male	9,859	876	8.9	9,792	872	8.9	723	7.4	-149	-1.5 ***
Not a veteran, female	23,748	2,621	11.0	23,733	2,581	10.9	2,038	8.6	-543	-2.3 ***
Household Size										
One person	12,107	2,036	16.8	12,121	2,028	16.7	1,714	14.1	-314	-2.6 ***
Two people	23,673	1,221	5.2	23,589	1,186	5.0	768	3.3	-418	-1.8 ***
Three or more people	7,508	669	8.9	7,507	665	8.9	509	6.8	-156	-2.1 ***
Retirement Income Imputation										
Retirement income imputed	7,725	714	9.2	6,575	601	9.1	383	5.8	-218	-3.3 ***
Retirement income not imputed	35,562	3,211	9.0	36,643	3,277	8.9	2,608	7.1	-669	-1.8 ***
Month in Sample										
MIS 1	5,379	520	9.7	5,373	540	10.1	406	7.6	-134	-2.5 ***
MIS 2	4,874	355	7.3	4,887	364	7.4	275	5.6	-89	-1.8 **
MIS 3	4,836	376	7.8	4,816	364	7.6	293	6.1	-71	-1.5 **
MIS 4	5,367	547	10.2	5,337	541	10.1	433	8.1	-108	-2.0 **
MIS 5	6,666	684	10.3	6,659	659	9.9	545	8.2	-114	-1.7 ***
MIS 6	6,091	581	9.5	6,070	577	9.5	421	6.9	-156	-2.6 ***
MIS 7	4,584	362	7.9	4,591	355	7.7	230	5.0	-125	-2.7 ***
MIS 8	5,489	501	9.1	5,485	479	8.7	388	7.1	-91	-1.7 **
N (persons)	23,446			21,239						

Source: 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : *p<0.10, **p<0.05, ***p<0.01. The Full CPS Sample (column 1) consists of all CPS persons aged 65 and over and uses only survey-based values to calculate poverty rates. The CPS PIK Sample (column 2) is a subset of the Full CPS Sample and includes only persons who are assigned a Personal Identification Key (PIK) that allows linking to administrative records, but the CPS PIK Sample continues to use only survey-based values to calculate poverty rates. The Linked CPS-Admin Sample (column 3) is the same set of people as the CPS PIK Sample except administrative record values have replaced the survey values for five types of income: earnings, Social Security, SSI, interest and dividends, and retirement income. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. CPS ASEC final person weights are used for the Full CPS Sample. For the CPS PIK Sample and the Linked CPS-Admin Sample we adjust the final person weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used for the CPS PIK Sample and the Linked CPS-Admin Sample. All poverty rate calculations compare total family (or unrelated individual) income to the relevant poverty threshold which varies by family size. A person is classified as in poverty if total family income is below the threshold. For more details see DeNavas-Walt et al. (2013).

Table 4. Cumulative income and poverty depth differences between CPS ASEC and administrative records: 2012

Panel A: Substituting one additional source at a time

	(1) CPS PIK Sample (Baseline Values)	(2) +Sub Earnings	(3) +Sub Social Security	(4) +Sub SSI	(5) +Sub Interest and Dividends	(6) +Sub Retirement Income	(7) Linked CPS-Admin Sample (Final Values)
		Percent Change in Household Income at Select Percentiles					
Householders aged 65 and over							
5th percentile	8,543	0.15%	-2.61%	2.98%	5.32%	11.89%	9,559
10th	11,661	-0.05%	2.07%	2.45%	5.46%	12.74%	13,146
25th	18,857	0.26%	1.75%	1.84%	6.71%	25.53%	23,672
Median	34,037	-0.10%	1.89%	1.68%	5.79%	30.36%	44,371
75th	63,322	-1.85%	-0.94%	-1.17%	0.55%	22.10%	77,314
90th	108,369	-0.96%	-0.42%	-0.65%	-1.93%	14.49%	124,069
95th	145,182	0.05%	1.67%	1.81%	0.52%	16.00%	168,411
Mean	51,736	1.09%	2.51%	2.55%	7.04%	27.91%	66,177
Gini coefficient	0.473	0.482	0.479	0.479	0.487	0.489	0.489
		Change in Proportion with Family Incomes Below Specified Ratio of Poverty Threshold					
People aged 65 and over							
0-50% of poverty threshold	0.026	0.000	0.001	-0.006	-0.007	-0.011	0.015
0-100%	0.090	0.001	-0.003	-0.005	-0.009	-0.021	0.069
0-150%	0.208	-0.001	-0.016	-0.016	-0.027	-0.060	0.148
0-200%	0.334	0.001	-0.016	-0.015	-0.034	-0.098	0.236
N (households)				13,656			
N (persons)				21,239			

Panel B: Substituting one source only

	(1) CPS PIK Sample (Baseline Values)	(2) Sub Only Earnings	(3) Sub Only Social Security	(4) Sub Only SSI	(5) Sub Only Interest and Dividends	(6) Sub Only Retirement Income
		Percent Change in Household Income at Select Percentiles				
Householders aged 65 and over						
5th percentile	8,543	0.15%	-2.68%	0.68%	4.81%	13.26%
10th	11,661	-0.05%	2.23%	1.58%	4.02%	11.64%
25th	18,857	0.26%	1.26%	0.40%	5.02%	18.21%
Median	34,037	-0.10%	2.61%	-0.14%	4.45%	24.54%
75th	63,322	-1.85%	1.10%	-0.14%	1.75%	21.46%
90th	108,369	-0.96%	0.30%	-0.12%	-1.49%	15.29%
95th	145,182	0.05%	1.63%	0.00%	-2.17%	15.39%
Mean	51,736	1.09%	1.42%	0.04%	4.49%	20.88%
Gini index	0.473	0.482	0.471	0.473	0.480	0.476
		Change in Proportion with Family Incomes Below Specified Ratio of Poverty Threshold				
People aged 65 and over						
0-50% of poverty threshold	0.026	0.000	0.002	0.001	-0.003	-0.007
0-100%	0.090	0.001	-0.004	-0.003	-0.008	-0.018
0-150%	0.208	-0.001	-0.015	-0.003	-0.013	-0.048
0-200%	0.334	0.001	-0.017	-0.001	-0.020	-0.078
N (households)			13,656			
N (persons)			21,239			

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes: The top section of the table analyzes household income quantiles. The CPS PIK Sample (Baseline Values) in column 1 consists of all CPS households with a householder aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records, but uses only survey-based values to calculate household income quantiles. Each subsequent column maintains the same set of households but replaces one source of survey-based income with its administrative counterpart. In Panel A, income sources are replaced one at a time in a cumulative fashion and in each column households are re-ranked based on the new measure of income. Five types of income are replaced: earnings, Social Security, SSI, interest and dividends, and retirement income. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. After a new set of household income quantiles is estimated, the percentage change relative to baseline values is calculated. The Linked CPS-Admin Sample (Final Values) in column 7 represents the cumulative effect (expressed in levels) of replacing all five types of survey-based income with administrative counterparts.
The bottom half of the table analyzes the distribution of persons across various income-to-poverty ratio intervals. An income-to poverty ratio is calculated as a person's total family (or unrelated individual) income divided by the relevant poverty threshold which varies based on family size. See DeNavas-Walt et al. (2013) for more details. The CPS PIK Sample (Baseline Values) in column 1 consists of all CPS persons aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records, but uses only survey-based values to calculate income to poverty ratios. Each subsequent column maintains the same set of persons but replaces one source of survey-based income with its administrative counterpart. Five types of income are replaced: earnings, social security, SSI, interest and dividends, and retirement income. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. Income sources are replaced one at a time in a cumulative fashion. In each column the distribution of persons across the various income to poverty ratio intervals is re-estimated, and the difference in the distribution relative to the baseline values is shown. The Linked CPS-Admin Sample (Final Values) in column 7 represents the cumulative effect (expressed in terms of the final distribution) of replacing all five types of survey-based income with administrative counterparts.
All estimates make use of CPS final household/person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 5. Decomposition of intensive and extensive margins of retirement income misreporting: 2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Proportion of Total Difference from each Replacement			
	CPS Baseline	Replace False Positives	+Replace True Positives	+Replace False Negatives	False Positives	True Positives	False Negatives	+Replace All Other Admin
Household income amounts, householders aged 65 and over								
5th	8,543	8,234	8,285	9,653	-0.279	0.045	1.233	9,559
10th	11,661	11,340	11,407	13,003	-0.239	0.050	1.189	13,146
25th	18,857	18,281	18,743	22,256	-0.170	0.136	1.034	23,672
Median	34,037	33,085	35,419	42,339	-0.115	0.281	0.833	44,371
75th	63,322	62,153	67,326	76,808	-0.087	0.384	0.703	77,314
90th	108,369	107,064	113,969	124,815	-0.079	0.420	0.660	124,069
95th	145,182	144,423	153,979	167,338	-0.034	0.431	0.603	168,411
Mean	51,736	50,828	54,783	62,477	-0.085	0.368	0.716	66,177
Proportions below specified income-to-poverty ratios, people aged 65 and over								
0-50%	0.026	0.029	0.029	0.019	-0.424	0.037	1.387	0.015
0-100%	0.090	0.096	0.095	0.072	-0.381	0.108	1.273	0.069
0-150%	0.208	0.219	0.211	0.161	-0.225	0.152	1.073	0.148
0-200%	0.334	0.348	0.334	0.257	-0.175	0.183	0.993	0.236
Retirement income amounts (unconditional), people aged 65 and over								
Median	1,834	1,754	1,792	2,991	-0.069	0.033	1.036	--
Mean	6,559	5,962	8,617	13,770	-0.083	0.368	0.715	--
N (households)	13,656							
N (persons)	21,239							

Source: 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes: The top section of the table analyzes household income quantiles. The CPS PIK Sample (Baseline Values) in column 1 consists of all CPS households with a householder aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records, but uses only survey-based values to calculate household income quantiles. Each of the next three columns maintains the same set of households but uses the 1099-R administrative records to correct for one type of retirement income misreporting. After each correction, households are re-ranked based on the new measure of income. Corrections are made in a cumulative fashion. Column 2 replaces false positives with zeros, column 3 swaps the amounts in the survey for the amounts in the administrative records among those with positive amounts in both sources, and column 4 replaces the false negative reports with the amounts from the administrative records. Columns 5 through 7 compute the percentage of the overall change (relative to column 1) that is attributable to each type of misreporting. To put retirement income in context, column 8 then swaps the other four sources of survey income for their administrative record counterparts. The other four sources of income are: earnings, Social Security, SSI, and interest and dividends.

The second section of the table performs the same exercise for the proportion of persons aged 65 and over (with a PIK) that are below specified intervals of the income-to-poverty ratio. An income-to poverty ratio is calculated as a person's total family (or unrelated individual) income divided by the relevant poverty threshold which varies based on family size. See DeNavas-Walt et al. (2013) for more details. The third section of the table performs the same exercise for persons aged 65 and over (with a PIK) but examines the unconditional mean and median amounts of retirement income.

All estimates make use of CPS final household/person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 6, Panel A. Social Security recipiency by data source: 2012

	(1) True Negative	(2) False Positive	(3) False Negative	(4) True Positive	(5) Total CPS Receipt (2)+(4)	(6) Total Linked CPS-Admin Receipt (3)+(4)	(7) False Negative Rate (3)/((3)+(4))
PEOPLE AGED 65 AND OVER							
Total	0.080	0.058	0.067	0.795	0.853	0.863	0.078
Family Status							
In families	0.089	0.057	0.076	0.779	0.835	0.855	0.089
Householder	0.080	0.041	0.070	0.809	0.850	0.879	0.079
Unrelated individuals	0.060	0.060	0.047	0.833	0.893	0.880	0.054
Race and Hispanic Origin							
White	0.072	0.053	0.061	0.814	0.867	0.875	0.069
White, not Hispanic	0.068	0.051	0.056	0.825	0.876	0.881	0.064
Black	0.086	0.072	0.115	0.727	0.799	0.842	0.136
Asian	0.224	0.118	0.102	0.555	0.674	0.657	0.155
Hispanic (any race)	0.128	0.084	0.112	0.675	0.760	0.788	0.143
Sex							
Male	0.082	0.024	0.072	0.822	0.846	0.894	0.081
Female	0.078	0.084	0.063	0.774	0.858	0.838	0.076
Age							
Aged 65 to 74	0.112	0.059	0.081	0.747	0.807	0.828	0.098
Aged 75 to 84	0.041	0.055	0.051	0.852	0.907	0.904	0.057
Aged 85 and over	0.025	0.056	0.042	0.878	0.933	0.920	0.046
Nativity							
Native born	0.064	0.051	0.061	0.823	0.875	0.884	0.069
Foreign born	0.191	0.104	0.115	0.590	0.694	0.705	0.163
Naturalized	0.147	0.096	0.115	0.642	0.738	0.757	0.151
Not a citizen	0.318	0.126	0.115	0.440	0.566	0.555	0.207
Region							
Northeast	0.087	0.053	0.070	0.790	0.843	0.860	0.081
Midwest	0.060	0.055	0.051	0.834	0.889	0.885	0.058
South	0.075	0.061	0.075	0.789	0.850	0.864	0.087
West	0.102	0.059	0.069	0.770	0.829	0.839	0.082
Residence							
Inside metropolitan statistical areas	0.088	0.057	0.071	0.783	0.841	0.854	0.083
Inside principal cities	0.111	0.067	0.076	0.746	0.813	0.822	0.092
Outside principal cities	0.076	0.053	0.069	0.802	0.855	0.871	0.079
Outside metropolitan statistical areas	0.043	0.058	0.050	0.848	0.906	0.898	0.056
Disability Status							
With a disability	0.051	0.066	0.051	0.832	0.898	0.883	0.058
With no disability	0.093	0.054	0.075	0.779	0.833	0.853	0.088

Table 6, Panel A, continued. Social Security recipiency by data source: 2012

	(1) True Negative	(2) False Positive	(3) False Negative	(4) True Positive	(5) Total CPS Receipt (2)+(4)	(6) Total Linked CPS-Admin Receipt (3)+(4)	(7) False Negative Rate (3)/((3)+(4))
Educational Attainment							
Less than high school diploma	0.077	0.092	0.078	0.752	0.844	0.830	0.094
High school graduate	0.050	0.061	0.062	0.828	0.889	0.890	0.069
Some college	0.071	0.043	0.062	0.824	0.867	0.886	0.070
College graduate	0.131	0.043	0.072	0.754	0.797	0.827	0.088
Marital Status							
Married	0.086	0.047	0.073	0.795	0.841	0.867	0.084
Married, spouse absent	0.140	0.069	0.080	0.711	0.780	0.791	0.101
Widowed	0.044	0.081	0.048	0.826	0.908	0.875	0.055
Divorced	0.092	0.053	0.072	0.783	0.835	0.855	0.084
Separated	0.170	0.077	0.108	0.645	0.722	0.753	0.143
Never married	0.135	0.063	0.084	0.718	0.782	0.802	0.104
Housing Tenure							
Owner households with mortgage	0.116	0.057	0.082	0.745	0.802	0.826	0.099
Owner households without mortgage	0.058	0.051	0.062	0.830	0.880	0.891	0.069
Renter households	0.101	0.082	0.066	0.751	0.833	0.817	0.081
Veteran Status							
Veteran or Armed Forces	0.058	0.018	0.058	0.866	0.883	0.924	0.063
Not a veteran, male	0.104	0.031	0.085	0.780	0.811	0.865	0.099
Not a veteran, female	0.079	0.085	0.063	0.773	0.858	0.837	0.076
Month in Sample							
MIS 1	0.095	0.060	0.053	0.792	0.852	0.845	0.063
MIS 2	0.076	0.056	0.061	0.807	0.863	0.868	0.070
MIS 3	0.075	0.051	0.068	0.806	0.857	0.874	0.078
MIS 4	0.075	0.053	0.065	0.806	0.859	0.872	0.075
MIS 5	0.087	0.063	0.078	0.771	0.835	0.849	0.092
MIS 6	0.076	0.060	0.073	0.791	0.851	0.864	0.085
MIS 7	0.064	0.058	0.068	0.811	0.869	0.879	0.077
MIS 8	0.084	0.057	0.068	0.791	0.847	0.859	0.079
Householder							
Householder	0.080	0.041	0.070	0.809	0.850	0.879	0.079
Not a householder	0.079	0.067	0.066	0.788	0.855	0.854	0.077
Imputation Status							
Social Security income imputed	0.042	0.103	0.138	0.717	0.820	0.855	0.161
Social Security income not imputed	0.085	0.051	0.058	0.806	0.857	0.864	0.067
Household Size							
One person	0.058	0.061	0.041	0.840	0.901	0.881	0.047
Two people	0.077	0.049	0.066	0.809	0.857	0.875	0.075
Three or more people	0.124	0.081	0.114	0.682	0.762	0.796	0.143
Type of 1099-R							
IRA only	0.028	0.026	0.059	0.887	0.912	0.946	0.063
Employer-sponsored only	0.068	0.037	0.065	0.830	0.867	0.895	0.073
Both types	0.033	0.027	0.037	0.904	0.930	0.940	0.039

Table 6, Panel A, continued. Social Security recipiency by data source: 2012

	(1) True Negative	(2) False Positive	(3) False Negative	(4) True Positive	(5) Total CPS Receipt (2)+(4)	(6) Total Linked CPS-Admin Receipt (3)+(4)	(7) False Negative Rate (3)/((3)+(4))
Quintiles of 1099-R Amounts (Conditional >0)							
1	0.031	0.038	0.059	0.873	0.910	0.932	0.063
2	0.034	0.031	0.058	0.877	0.908	0.935	0.062
3	0.029	0.030	0.057	0.884	0.914	0.940	0.060
4	0.051	0.030	0.058	0.861	0.891	0.919	0.063
5	0.109	0.032	0.050	0.809	0.841	0.859	0.058
Quintiles of Admin Social Security Amounts (Conditional >0)							
1	--	--	0.112	0.888	0.888	1.000	0.112
2	--	--	0.078	0.922	0.922	1.000	0.078
3	--	--	0.068	0.932	0.932	1.000	0.068
4	--	--	0.058	0.942	0.942	1.000	0.058
5	--	--	0.074	0.926	0.926	1.000	0.074
Quintiles of Admin Total Income Amounts (Unconditional)							
1	0.135	0.191	0.067	0.607	0.799	0.674	0.099
2	0.022	0.022	0.062	0.894	0.916	0.956	0.065
3	0.037	0.023	0.059	0.881	0.904	0.940	0.062
4	0.068	0.026	0.067	0.839	0.865	0.906	0.074
5	0.136	0.026	0.082	0.756	0.782	0.838	0.098
Change in 1099-R Amount, 2012-2013 (Conditional 2012 Amount >0)							
Decrease more than 10%	0.056	0.032	0.079	0.833	0.865	0.913	0.087
Change within 10%	0.048	0.033	0.053	0.866	0.899	0.919	0.058
Increase more than 10%	0.060	0.028	0.047	0.865	0.893	0.912	0.052
N (persons)	21,239						

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : Sample consists of all CPS persons aged 65 and over who are assigned a Personal Identification Key (PIK) that allows linking to administrative records. “True negative” refers to the proportion of the sample who have zero administrative record Social Security income and report zero Social Security income in the survey. “False positive” refers to the proportion of the sample with zero administrative record income but report positive income in the survey. “False negative” refers to the proportion of the sample with positive administrative record income but report zero income in the survey. “True positive” refers to the proportion of the sample with positive administrative record income and report positive income in the survey. "Social Security income imputed" includes whole-supplement-imputed cases. All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 6, Panel B. Retirement income recipiency by data source: 2012

	(1) True Negative	(2) False Positive	(3) False Negative	(4) True Positive	(5) Total CPS Receipt (2)+(4)	(6) Total Linked CPS-Admin Receipt (3)+(4)	(7) False Negative Rate (3)/((3)+(4))
PEOPLE AGED 65 AND OVER							
Total	0.350	0.037	0.284	0.329	0.366	0.613	0.464
Family Status							
In families	0.365	0.036	0.292	0.307	0.344	0.599	0.487
Householder	0.310	0.036	0.290	0.364	0.400	0.654	0.443
Unrelated individuals	0.316	0.039	0.268	0.376	0.415	0.645	0.416
Race and Hispanic Origin							
White	0.333	0.035	0.291	0.341	0.377	0.632	0.460
White, not Hispanic	0.310	0.035	0.298	0.356	0.392	0.655	0.455
Black	0.396	0.050	0.260	0.295	0.345	0.554	0.468
Asian	0.571	0.050	0.233	0.146	0.196	0.379	0.616
Hispanic (any race)	0.594	0.035	0.209	0.163	0.198	0.371	0.562
Sex							
Male	0.279	0.045	0.272	0.404	0.449	0.676	0.403
Female	0.406	0.031	0.294	0.268	0.300	0.563	0.523
Age							
Aged 65 to 74	0.400	0.040	0.247	0.313	0.353	0.560	0.442
Aged 75 to 84	0.286	0.031	0.331	0.352	0.383	0.684	0.485
Aged 85 and over	0.273	0.041	0.340	0.345	0.387	0.685	0.496
Nativity							
Native born	0.318	0.036	0.293	0.353	0.389	0.646	0.453
Foreign born	0.581	0.047	0.223	0.149	0.196	0.373	0.600
Naturalized	0.527	0.045	0.255	0.174	0.218	0.428	0.594
Not a citizen	0.735	0.053	0.133	0.079	0.131	0.212	0.629
Region							
Northeast	0.317	0.035	0.297	0.352	0.386	0.648	0.458
Midwest	0.294	0.025	0.299	0.382	0.407	0.681	0.439
South	0.384	0.041	0.280	0.295	0.336	0.576	0.487
West	0.378	0.046	0.265	0.311	0.357	0.576	0.460
Residence							
Inside metropolitan statistical areas	0.346	0.037	0.287	0.330	0.367	0.617	0.466
Inside principal cities	0.375	0.041	0.270	0.314	0.355	0.584	0.462
Outside principal cities	0.331	0.035	0.296	0.338	0.373	0.634	0.467
Outside metropolitan statistical areas	0.366	0.037	0.272	0.325	0.362	0.597	0.455
Disability Status							
With a disability	0.365	0.049	0.260	0.326	0.375	0.586	0.443
With no disability	0.342	0.032	0.296	0.330	0.362	0.626	0.472

Table 6, Panel B, continued. Retirement income recipiency by data source: 2012

	(1) True Negative	(2) False Positive	(3) False Negative	(4) True Positive	(5) Total CPS Receipt (2)+(4)	(6) Total Linked CPS-Admin Receipt (3)+(4)	(7) False Negative Rate (3)/((3)+(4))
Educational Attainment							
Less than high school diploma	0.554	0.043	0.225	0.178	0.221	0.403	0.558
High school graduate	0.346	0.034	0.315	0.305	0.339	0.620	0.508
Some college	0.304	0.041	0.282	0.373	0.414	0.655	0.430
College graduate	0.254	0.034	0.286	0.427	0.461	0.712	0.401
Marital Status							
Married	0.347	0.035	0.298	0.321	0.356	0.619	0.481
Married, spouse absent	0.487	0.045	0.208	0.261	0.305	0.468	0.443
Widowed	0.298	0.040	0.302	0.360	0.400	0.662	0.456
Divorced	0.417	0.042	0.223	0.319	0.361	0.541	0.411
Separated	0.575	0.073	0.177	0.175	0.248	0.352	0.502
Never married	0.424	0.031	0.217	0.328	0.359	0.545	0.397
Housing Tenure							
Owner households with mortgage	0.360	0.040	0.260	0.341	0.380	0.600	0.432
Owner households without mortgage	0.295	0.032	0.319	0.354	0.386	0.673	0.474
Renter households	0.522	0.051	0.203	0.225	0.275	0.427	0.474
Veteran Status							
Veteran or Armed Forces	0.192	0.051	0.268	0.489	0.540	0.757	0.354
Not a veteran, male	0.365	0.038	0.278	0.318	0.357	0.596	0.466
Not a veteran, female	0.407	0.031	0.294	0.268	0.299	0.561	0.523
Month in Sample							
MIS 1	0.370	0.030	0.274	0.326	0.356	0.600	0.457
MIS 2	0.340	0.039	0.291	0.330	0.370	0.621	0.468
MIS 3	0.317	0.040	0.292	0.351	0.391	0.643	0.454
MIS 4	0.348	0.035	0.289	0.329	0.363	0.617	0.467
MIS 5	0.379	0.040	0.275	0.306	0.346	0.581	0.473
MIS 6	0.364	0.039	0.285	0.312	0.351	0.597	0.477
MIS 7	0.323	0.039	0.291	0.347	0.386	0.638	0.456
MIS 8	0.338	0.036	0.284	0.341	0.378	0.626	0.454
Householder							
Householder	0.310	0.036	0.290	0.364	0.400	0.654	0.443
Not a householder	0.371	0.038	0.281	0.310	0.348	0.591	0.476
Imputation Status							
Retirement income imputed	0.291	0.108	0.361	0.241	0.349	0.602	0.599
Retirement income not imputed	0.360	0.025	0.271	0.345	0.369	0.615	0.440
Household Size							
One person	0.309	0.035	0.267	0.389	0.424	0.656	0.407
Two people	0.332	0.036	0.305	0.328	0.364	0.632	0.482
Three or more people	0.472	0.045	0.249	0.234	0.279	0.484	0.515

Table 6, Panel B, continued. Retirement income recipiency by data source: 2012

	(1) True Negative	(2) False Positive	(3) False Negative	(4) True Positive	(5) Total CPS Receipt (2)+(4)	(6) Total Linked CPS-Admin Receipt (3)+(4)	(7) False Negative Rate (3)/((3)+(4))
Type of 1099-R							
IRA only	--	--	0.814	0.186	0.186	1.000	0.814
Employer-sponsored only	--	--	0.398	0.602	0.602	1.000	0.398
Both types	--	--	0.354	0.646	0.646	1.000	0.354
Quintiles of 1099-R Amounts (Conditional >0)							
1	--	--	0.719	0.281	0.281	1.000	0.719
2	--	--	0.528	0.472	0.472	1.000	0.528
3	--	--	0.429	0.571	0.571	1.000	0.429
4	--	--	0.329	0.671	0.671	1.000	0.329
5	--	--	0.313	0.687	0.687	1.000	0.313
Quintiles of Admin Social Security Amounts (Conditional >0)							
1	0.522	0.048	0.226	0.204	0.252	0.430	0.526
2	0.436	0.045	0.286	0.233	0.278	0.519	0.551
3	0.270	0.034	0.310	0.386	0.420	0.696	0.445
4	0.160	0.031	0.331	0.478	0.509	0.809	0.409
5	0.175	0.020	0.361	0.444	0.464	0.805	0.449
Quintiles of Admin Total Income Amounts (Unconditional)							
1	0.785	0.076	0.100	0.040	0.116	0.140	0.714
2	0.473	0.062	0.287	0.178	0.240	0.465	0.616
3	0.207	0.023	0.371	0.399	0.422	0.770	0.482
4	0.127	0.012	0.342	0.519	0.531	0.861	0.397
5	0.156	0.014	0.323	0.508	0.522	0.830	0.389
Change in 1099-R Amount, 2012-2013 (Conditional 2012 Amount >0)							
Decrease more than 10%	--	--	0.597	0.403	0.403	1.000	0.597
Change within 10%	--	--	0.413	0.587	0.587	1.000	0.413
Increase more than 10%	--	--	0.538	0.462	0.462	1.000	0.538
N (persons)	21,239						

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : Sample consists of all CPS persons aged 65 and over who are assigned a Personal Identification Key (PIK) that allows linking to administrative records. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. “True negative” refers to the proportion of the sample who have zero administrative record retirement income and report zero retirement income in the survey. “False positive” refers to the proportion of the sample with zero administrative record income but report positive income in the survey. “False negative” refers to the proportion of the sample with positive administrative record income but report zero income in the survey. “True positive” refers to the proportion of the sample with positive administrative record income and report positive income in the survey. "Retirement income imputed" includes whole-supplement-imputed cases. All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 7. Linear probability model of survey-reported retirement income receipt among true recipients, aged 65 and over: 2012

	(1)	(2)	(3)
Independent variables	**Any CPS ASEC retirement income**	**Any CPS ASEC retirement income**	**Any CPS ASEC retirement income**
Householder	0.031***	0.030***	0.016
	(0.011)	(0.011)	(0.010)
Female	-0.084***	-0.083***	-0.030**
	(0.013)	(0.013)	(0.012)
Disabled	0.092***	0.097***	0.088***
	(0.013)	(0.013)	(0.012)
Homeowner	0.016	0.020	0.005
	(0.015)	(0.016)	(0.015)
Veteran	0.094***	0.095***	0.070***
	(0.016)	(0.016)	(0.014)
Race and Hispanic Origin (Other race, not Hispanic omitted)			
White, non-Hispanic	0.003	-0.001	0.021
	(0.057)	(0.058)	(0.056)
Black, non-Hispanic	0.002	0.002	-0.036
	(0.061)	(0.061)	(0.060)
Asian, non-Hispanic	-0.070	-0.076	-0.072
	(0.065)	(0.064)	(0.064)
Hispanic, any race	-0.047	-0.057	-0.065
	(0.058)	(0.059)	(0.059)
Educational Attainment (Less than high school omitted)			
High school graduate	0.048***	0.050***	0.035**
	(0.015)	(0.015)	(0.014)
Some college	0.114***	0.112***	0.079***
	(0.018)	(0.017)	(0.016)
College graduate	0.153***	0.155***	0.084***
	(0.019)	(0.018)	(0.018)
Nativity (US born omitted)			
Foreign born	-0.076***	-0.073***	-0.022
	(0.023)	(0.023)	(0.022)
Marital Status (Married omitted)			
Married, spouse absent	0.076	0.074	0.043
	(0.054)	(0.054)	(0.049)
Widowed	0.105***	0.107***	0.036*
	(0.020)	(0.020)	(0.019)
Divorced	0.084***	0.083***	0.046**
	(0.024)	(0.024)	(0.023)
Separated	-0.007	-0.006	-0.041
	(0.060)	(0.059)	(0.058)
Never married	0.093***	0.092***	0.042
	(0.029)	(0.028)	(0.026)

Table 7, continued. Linear probability model of survey-reported retirement income receipt among true recipients, aged 65 and over: 2012

Independent variables	(1) Any CPS ASEC retirement income	(2) Any CPS ASEC retirement income	(3) Any CPS ASEC retirement income
Region (Northeast omitted)			
Midwest	0.006	-0.001	-0.001
	(0.017)	(0.017)	(0.015)
South	-0.051***	-0.054***	-0.056***
	(0.013)	(0.013)	(0.012)
West	-0.023	-0.021	-0.017
	(0.017)	(0.016)	(0.015)
Metropolitan Area (Principal cities omitted)			
Outside principal cities	-0.013	-0.012	-0.007
	(0.013)	(0.013)	(0.012)
Outside MSAs	0.004	0.003	0.002
	(0.017)	(0.017)	(0.016)
Household Size (One person omitted)			
Two persons	-0.024	-0.021	-0.018
	(0.016)	(0.016)	(0.015)
Three or more persons	-0.022	-0.004	-0.006
	(0.072)	(0.068)	(0.063)
Retirement income imputed		-0.158***	-0.155***
		(0.013)	(0.014)
Month in Sample (MIS 1 omitted)			
MIS 2		-0.015	-0.007
		(0.023)	(0.022)
MIS 3		0.005	-0.002
		(0.023)	(0.023)
MIS 4		-0.014	-0.007
		(0.021)	(0.020)
MIS 5		0.002	-0.001
		(0.021)	(0.019)
MIS 6		-0.017	-0.015
		(0.021)	(0.020)
MIS 7		-0.004	-0.008
		(0.023)	(0.021)
MIS 8		0.003	0.015
		(0.019)	(0.019)

Table 7, continued. Linear probability model of survey-reported retirement income receipt among true recipients, aged 65 and over: 2012

Independent variables	(1) Any CPS ASEC retirement income	(2) Any CPS ASEC retirement income	(3) Any CPS ASEC retirement income
Type of 1099-R (IRA only omitted)			
Employer-sponsored only			0.315***
			(0.013)
Both types			0.326***
			(0.015)
Quintiles of 1099-R Amounts (Lowest quintile omitted)			
2			0.135***
			(0.015)
3			0.201***
			(0.016)
4			0.260***
			(0.016)
5			0.278***
			(0.017)
Change in 1099-R Amount, 2012-2013 (Change within 10% omitted)			
Decrease more than 10%			-0.156***
			(0.015)
Increase more than 10%			-0.046***
			(0.014)
Constant	0.435***	0.463***	0.079
	(0.067)	(0.067)	(0.067)
Age fixed effects	Y	Y	Y
N (persons)	20,703	20,703	20,703
R-squared	0.061	0.074	0.212

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : *** p<0.01, ** p<0.05, * p<0.10. Robust standard errors in parentheses. "Retirement income imputed" includes whole-supplement-imputed cases. "Birthplace missing" is included as a control but coefficient suppressed due to small cell size.

The sample consists of all persons aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records, who receive 1099-R income in 2012, and who survive through 2013. The survival restriction is implemented in order to compute changes in 1099-R income between 2012 and 2013. Each column represents a separate specification of a linear probability model where the dependent variable is an indicator variable for survey-based receipt of retirement income. Column (1) includes only demographic covariates. Column (2) adds survey design features. Column (3) adds 1099-R features. “Retirement income imputed” refers to both full-supplement imputations as well as item imputations.

All models are estimated using CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 8. Receipt rates and amounts of retirement income and Social Security across Aged Unit income distribution: 2012

Panel A: Retirement income

CPS Aged Unit Income Decile	Mean CPS Aged Unit Income	Retirement Income: Receipt: CPS	Retirement Income: Receipt: Admin: Total	Retirement Income: Receipt: Admin: Non-IRA: Total	Retirement Income: Receipt: Admin: Non-IRA: D.B.	Retirement Income: Receipt: Admin: Non-IRA: IRA	Retirement Income: Receipt: Admin: Non-IRA: D.C.	Retirement Income: Receipt: Admin: Non-IRA: Unknown	Retirement Income: Mean Amount (Unconditional): CPS	Retirement Income: Mean Amount (Unconditional): Admin: Total	Retirement Income: Mean Amount (Unconditional): Admin: Non-IRA: Total	Retirement Income: Mean Amount (Unconditional): Admin: Non-IRA: D.B.	Retirement Income: Mean Amount (Unconditional): Admin: IRA	Retirement Income: Mean Amount (Unconditional): Admin: Non-IRA: D.C.	Retirement Income: Mean Amount (Unconditional): Admin: Non-IRA: Unknown	Retirement Income: Mean Amount (Conditional on Receipt): CPS	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Total	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Non-IRA: Total	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Non-IRA: D.B.	Retirement Income: Mean Amount (Conditional on Receipt): Admin: IRA	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Non-IRA: D.C.	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Non-IRA: Unknown
1	5,032	0.07	0.36	0.29	0.12	0.03	0.02	216	6,177	4,704	1,143	162	165	3,109	17,202	16,003	9,598	6,245	9,436
2	11,620	0.12	0.41	0.35	0.15	0.02	0.02	467	4,812	3,643	1,020	82	66	3,903	11,810	10,554	6,915	4,725	4,207
3	15,381	0.22	0.57	0.46	0.22	0.02	0.02	966	8,685	6,108	2,203	223	148	4,455	15,249	13,371	10,007	10,689	7,448
4	19,604	0.35	0.66	0.52	0.30	0.03	0.02	2,058	13,617	10,169	3,151	157	140	5,852	20,610	19,474	10,617	5,676	5,735
5	25,075	0.47	0.76	0.63	0.35	0.04	0.04	3,933	16,335	9,559	6,062	326	388	8,340	21,410	15,274	17,413	7,402	10,863
6	31,757	0.59	0.81	0.68	0.39	0.06	0.03	7,046	20,027	12,328	6,724	484	491	11,914	24,631	18,092	17,300	8,692	14,651
7	40,793	0.65	0.84	0.71	0.43	0.07	0.05	10,601	21,357	14,193	5,971	542	647	16,276	25,569	19,904	14,039	8,297	13,727
8	54,286	0.68	0.81	0.69	0.37	0.06	0.04	15,290	24,745	17,225	5,824	1,076	575	22,376	30,587	25,074	15,627	17,341	14,037
9	76,677	0.66	0.80	0.68	0.41	0.08	0.04	21,446	28,998	19,774	7,119	1,264	778	32,328	36,189	29,231	17,173	14,951	20,539
10	172,800	0.60	0.78	0.63	0.44	0.09	0.04	26,858	42,539	24,570	14,239	1,916	1,805	45,110	54,528	39,140	32,671	20,688	43,520
Overall	45,288	0.44	0.68	0.56	0.32	0.05	0.03	8,886	18,727	12,226	5,345	623	520	20,138	27,550	21,720	16,871	12,560	16,560

Admin Aged Unit Income Decile	Mean Admin Aged Unit Income	Retirement Income: Receipt: CPS	Retirement Income: Receipt: Admin: Total	Retirement Income: Receipt: Admin: Non-IRA: Total	Retirement Income: Receipt: Admin: Non-IRA: D.B.	Retirement Income: Receipt: Admin: IRA	Retirement Income: Receipt: Admin: Non-IRA: D.C.	Retirement Income: Receipt: Admin: Non-IRA: Unknown	Retirement Income: Mean Amount (Unconditional): CPS	Retirement Income: Mean Amount (Unconditional): Admin: Total	Retirement Income: Mean Amount (Unconditional): Admin: Non-IRA: Total	Retirement Income: Mean Amount (Unconditional): Admin: Non-IRA: D.B.	Retirement Income: Mean Amount (Unconditional): Admin: IRA	Retirement Income: Mean Amount (Unconditional): Admin: Non-IRA: D.C.	Retirement Income: Mean Amount (Unconditional): Admin: Non-IRA: Unknown	Retirement Income: Mean Amount (Conditional on Receipt): CPS	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Total	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Non-IRA: Total	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Non-IRA: D.B.	Retirement Income: Mean Amount (Conditional on Receipt): Admin: IRA	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Non-IRA: D.C.	Retirement Income: Mean Amount (Conditional on Receipt): Admin: Non-IRA: Unknown
1	6,447	0.12	0.09	0.07	0.01	--	--	1,280	261	235	22	--	--	10,400	3,006	3,202	1,545	--	--
2	13,046	0.21	0.28	0.22	0.06	--	0.02	2,298	840	686	120	--	32	10,960	2,977	3,129	1,955	--	1,746
3	18,841	0.32	0.56	0.45	0.15	0.02	0.02	3,388	2,606	2,120	363	51	69	10,479	4,666	4,703	2,495	2,932	2,927
4	25,171	0.42	0.73	0.60	0.24	0.02	0.03	4,428	5,618	4,452	905	77	179	10,643	7,734	7,467	3,710	3,219	7,074
5	32,505	0.48	0.82	0.65	0.36	0.04	0.04	6,191	9,458	7,183	1,828	136	309	12,917	11,581	11,095	5,103	3,620	7,640
6	41,819	0.56	0.87	0.73	0.37	0.05	0.04	8,821	14,543	11,442	2,470	267	334	15,805	16,754	15,572	6,697	5,271	9,136
7	52,646	0.55	0.87	0.73	0.44	0.06	0.04	10,331	18,734	13,948	3,833	423	479	18,645	21,555	19,154	8,765	7,108	12,299
8	67,436	0.61	0.87	0.75	0.49	0.09	0.04	14,407	27,146	19,901	5,986	557	696	23,502	31,067	26,607	12,292	6,433	15,707
9	92,249	0.60	0.87	0.75	0.52	0.10	0.03	17,213	37,265	25,677	9,788	1,269	520	28,674	42,606	34,023	18,957	12,536	17,882
10	230,579	0.54	0.84	0.68	0.54	0.11	0.06	20,507	70,818	36,625	28,139	3,448	2,583	38,280	84,149	54,177	52,534	30,554	46,712
Overall	58,068	0.44	0.68	0.56	0.32	0.05	0.03	8,886	18,727	12,226	5,345	623	520	20,138	27,550	21,720	16,871	12,560	16,560

Weighted count (Aged Units)	32,613,260
N (Aged Units)	16,053

Panel B: Social Security

		Social Security					
CPS Aged Unit Income Decile	**Mean CPS Aged Unit Income**	**Receipt**		**Mean Amount (Unconditional)**		**Mean Amount (Conditional on Receipt)**	
		CPS	Admin	CPS	Admin	CPS	Admin
1	5,032	0.56	0.72	3,815	9,043	6,794	12,596
2	11,620	0.94	0.87	10,129	10,745	10,829	12,325
3	15,381	0.95	0.92	13,212	13,431	13,950	14,638
4	19,604	0.94	0.93	15,547	15,242	16,457	16,441
5	25,075	0.95	0.93	18,012	18,012	18,886	19,313
6	31,757	0.92	0.93	18,857	19,261	20,475	20,674
7	40,793	0.92	0.93	20,670	20,450	22,517	22,065
8	54,286	0.89	0.90	21,456	20,539	24,205	22,752
9	76,677	0.87	0.89	20,577	20,631	23,591	23,235
10	172,800	0.79	0.85	20,349	21,512	25,602	25,309
Overall	45,288	0.87	0.89	16,254	16,884	18,617	19,046
Admin Aged Unit Income Decile	**Mean Admin Aged Unit Income**	**Receipt**		**Mean Amount (Unconditional)**		**Mean Amount (Conditional on Receipt)**	
		CPS	Admin	CPS	Admin	CPS	Admin
1	6,447	0.75	0.54	8,159	3,892	10,930	7,177
2	13,046	0.89	0.94	11,516	10,850	12,977	11,601
3	18,841	0.92	0.96	14,046	14,450	15,286	15,106
4	25,171	0.92	0.95	15,124	15,926	16,519	16,735
5	32,505	0.91	0.93	16,553	17,232	18,184	18,553
6	41,819	0.90	0.93	17,784	19,115	19,666	20,609
7	52,646	0.90	0.93	19,160	20,569	21,331	22,140
8	67,436	0.90	0.93	20,112	21,436	22,459	23,021
9	92,249	0.87	0.90	20,605	22,303	23,571	24,681
10	230,579	0.78	0.86	19,491	23,068	24,972	26,865
Overall	58,068	0.87	0.89	16,254	16,884	18,617	19,046
Weighted count (Aged Units)			32,613,260				
N (Aged Units)			16,053				

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : The sample consists of *aged units* as defined in the Social Security Administration's *Income of the Aged Chartbook, 2012* . Aged units are either unmarried individuals aged 65 and over or married couples where the husband is aged 65 and over (or married couples where the wife is aged 65 and over and the husband is less than 55). For married couples, incomes of both spouses are combined. Each aged unit is one observation in our analysis. We restrict attention to aged units where the unit head is assigned a Protection Identification Key (PIK) that allows linking to administrative records.

Panel A reports retirement income receipt rates, unconditional mean, and conditional mean amounts using both the survey and the administrative record measures. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. The top half of Panel A ranks aged units by total survey income deciles while the bottom half ranks aged units by total administrative record income deciles. Total administrative record retirement income from the 1099-R is further categorized as defined benefit, IRA, non-IRA defined contribution, and unknown. For further details about how these categories are determined, please see the Method Appendix.

Panel B reports Social Security receipt rates, unconditional mean and conditional mean amounts using both the survey and the administrative record measures. The top half of Panel B ranks aged units by total survey income deciles while the bottom half ranks aged units by total administrative record income deciles.

All estimates make use of CPS final person weights for the aged unit head. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 9. Average shares of income from various income sources across Aged Unit income distribution: 2012

Panel A: CPS income shares

CPS Aged Unit Income Decile	Mean CPS Income	Earnings	Social Security	SSI	Interest and Dividends	Retirement Income					Other Income
						Total	D.B.	IRA	Non-IRA D.C.	Unknown	
1	6,630	0.05	0.69	0.13	0.06	0.05	--	--	--	--	0.02
2	11,620	0.03	0.87	0.05	0.01	0.04	--	--	--	--	0.01
3	15,381	0.03	0.86	0.02	0.02	0.06	--	--	--	--	0.01
4	19,604	0.05	0.79	0.01	0.02	0.10	--	--	--	--	0.02
5	25,075	0.08	0.72	0.00	0.03	0.16	--	--	--	--	0.01
6	31,757	0.12	0.60	0.00	0.04	0.22	--	--	--	--	0.02
7	40,793	0.16	0.51	0.00	0.04	0.26	--	--	--	--	0.02
8	54,286	0.23	0.40	0.00	0.06	0.28	--	--	--	--	0.03
9	76,677	0.33	0.27	0.00	0.08	0.28	--	--	--	--	0.03
10	172,800	0.47	0.15	0.00	0.14	0.19	--	--	--	--	0.05
Overall	46,418	0.16	0.58	0.02	0.05	0.17	--	--	--	--	0.02
N (Aged Units)			15,654								

Panel B: Admin income shares

Admin Aged Unit Income Decile	Mean Admin Income	Earnings	Social Security	SSI	Interest and Dividends	Retirement Income					Other Income
						Total	D.B.	IRA	Non-IRA D.C.	Unknown	
1	7,518	0.03	0.55	0.30	0.04	0.06	0.05	0.00	0.00	0.00	0.02
2	13,046	0.03	0.83	0.04	0.02	0.06	0.05	0.01	0.00	0.00	0.01
3	18,841	0.04	0.77	0.02	0.02	0.13	0.11	0.02	0.00	0.00	0.01
4	25,171	0.08	0.64	0.00	0.04	0.22	0.18	0.03	0.00	0.01	0.02
5	32,505	0.11	0.53	0.00	0.05	0.29	0.22	0.06	0.00	0.01	0.02
6	41,819	0.13	0.46	0.00	0.05	0.35	0.27	0.06	0.01	0.01	0.02
7	52,646	0.17	0.39	0.00	0.06	0.36	0.27	0.07	0.01	0.01	0.02
8	67,436	0.19	0.32	0.00	0.07	0.40	0.30	0.09	0.01	0.01	0.02
9	92,249	0.25	0.24	0.00	0.08	0.40	0.28	0.11	0.01	0.01	0.02
10	230,579	0.35	0.14	0.00	0.12	0.34	0.20	0.12	0.02	0.01	0.04
Overall	58,908	0.14	0.49	0.03	0.06	0.27	0.19	0.06	0.01	0.01	0.02
Weighted (Aged Units)			32,613,260								
N (Aged Units)			15,812								

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : The sample consists of *aged units* as defined in the Social Security Administration's *Income of the Aged Chartbook, 2012* . Aged units are either unmarried individuals aged 65 and over or married couples where the husband is aged 65 and over (or married couples where the wife is aged 65 and over and the husband is less than 55). For married couples, incomes of both spouses are combined. Each aged unit is one observation in our analysis. We restrict attention to aged units where the unit head is assigned a Protection Identification Key (PIK) that allows linking to administrative records.

Panel A sorts aged units by total survey income into deciles and within each decile computes the average share of each income source based on survey values. Panel B repeats the analysis but uses the administrative record income to sort aged units into deciles and compute average shares of each income source. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. When using the administrative records, retirement income is further categorized as defined benefit, IRA, non-IRA defined contribution, and unknown. For further details about how these categories are determined, please see the Method Appendix. Other income refers to other survey income sources outside of earnings, Social Security, SSI, interest and dividends, and retirement income.

All estimates make use of CPS final person weights for the aged unit head. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 10. Proportions depending on Social Security for various percentages of income

	Proportion of Social Security Beneficiaries	
Aged Unit Analysis	**CPS PIK Sample**	**Linked CPS-Admin Sample**
Social Security		
At least 50% of Income	0.644	0.504
	(0.005)	(0.005)
At least 90% of Income	0.355	0.181
	(0.005)	(0.004)
N (Aged Units)	13,947	14,162
Family Analysis (Person-weighted)	**CPS PIK Sample**	**Linked CPS-Admin Sample**
Social Security		
At least 50% of Income	0.555	0.422
	(0.005)	(0.005)
At least 90% of Income	0.262	0.122
	(0.005)	(0.003)
N (families)	18,805	19,232

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : In the top half of the table, the sample consists of aged units as defined in the Social Security Administration's Income of the Aged Chartbook, 2012. Aged units are either unmarried individuals aged 65 and over or married couples where the husband is aged 65 and over (or married couples where the wife is aged 65 and over and the husband is less than 55). For married couples, incomes of both spouses are combined. Each aged unit is one observation in our analysis. We restrict attention to aged units where the unit head is assigned a Protection Identification Key (PIK) that allows linking to administrative records and who have positive Social Security income. The CPS PIK sample uses survey values to calculate the proportion of aged unit Social Security beneficiaries (according to the survey) who rely on Social Security for at least 50 and 90 percent of their total incomes. The Linked CPS-Admin sample uses administrative record values to calculate the fraction of aged unit Social Security beneficiaries (according to the administrative records) who rely on Social Security for at least 50 and 90 percent of their total incomes.

In the bottom half of the table, the sample consists of all persons aged 65 and over who are assigned a PIK and whose family has positive Social Security Income. The unit of analysis is a person. The CPS PIK sample uses survey values to calculate the proportion of persons in families with Social Security beneficiaries (according to the survey) who rely on Social Security for at least 50 and 90 percent of their total family incomes. The Linked CPS-Admin sample uses administrative record values to calculate the proportion of persons in families with Social Security beneficiaries (according to the administrative records) who rely on Social Security for at least 50 and 90 percent of their total family incomes.

All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 11. Number and proportion of people lifted out of poverty by income source: 2012
(Numbers in thousands.)

	CPS PIK Sample						Linked CPS-Admin Sample					
	Social Security Excluded		Social Security Included		Lifted out of Poverty (Difference)		Social Security Excluded		Social Security Included		Lifted out of Poverty (Difference)	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Aged 65 and over	19,184	0.444	3,879	0.090	15,305	0.354	13,317	0.308	2,992	0.069	10,325	0.239
Aged 65 to 74	8,866	0.359	1,937	0.079	6,929	0.280	6,377	0.258	1,665	0.067	4,712	0.191
Aged 75 to 84	7,202	0.542	1,302	0.098	5,900	0.444	4,767	0.359	924	0.070	3,843	0.289
Aged 85 and over	3,116	0.591	640	0.121	2,476	0.470	2,173	0.412	403	0.076	1,770	0.336

	CPS PIK Sample						Linked CPS-Admin Sample					
	SSI Excluded		SSI Included		Lifted out of Poverty (Difference)		SSI Excluded		SSI Included		Lifted out of Poverty (Difference)	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Aged 65 and over	4,191	0.097	3,879	0.090	312	0.007	3,325	0.077	2,992	0.069	333	0.008
Aged 65 to 74	2,099	0.085	1,937	0.079	162	0.006	1,817	0.074	1,665	0.067	152	0.007
Aged 75 to 84	1,405	0.106	1,302	0.098	103	0.008	1,058	0.080	924	0.070	134	0.010
Aged 85 and over	688	0.130	640	0.121	48	0.009	450	0.085	403	0.076	47	0.009

	CPS PIK Sample						Linked CPS-Admin Sample					
	Retirement Income Excluded		Retirement Income Included		Lifted out of Poverty (Difference)		Retirement Income Excluded		Retirement Income Included		Lifted out of Poverty (Difference)	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Aged 65 and over	5,790	0.134	3,879	0.090	1,911	0.044	5,090	0.118	2,992	0.069	2,098	0.049
Aged 65 to 74	2,867	0.116	1,937	0.079	930	0.037	2,671	0.108	1,665	0.067	1,006	0.041
Aged 75 to 84	1,981	0.149	1,302	0.098	679	0.051	1,735	0.131	924	0.070	811	0.061
Aged 85 and over	943	0.179	640	0.121	303	0.058	685	0.130	403	0.076	282	0.054

	CPS PIK Sample						Linked CPS-Admin Sample					
	Earnings Excluded		Earnings Included		Lifted out of Poverty (Difference)		Earnings Excluded		Earnings Included		Lifted out of Poverty (Difference)	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Aged 65 and over	8,786	0.203	3,879	0.090	4,907	0.113	6,631	0.153	2,992	0.069	3,639	0.084
Aged 65 to 74	5,569	0.226	1,937	0.079	3,632	0.147	4,410	0.179	1,665	0.067	2,745	0.112
Aged 75 to 84	2,232	0.168	1,302	0.098	930	0.070	1,595	0.120	924	0.070	671	0.050
Aged 85 and over	985	0.187	640	0.121	345	0.066	626	0.119	403	0.076	223	0.043

	CPS PIK Sample						Linked CPS-Admin Sample					
	Interest & Dividends Excluded		Interest & Dividends Included		Lifted out of Poverty (Difference)		Interest & Dividends Excluded		Interest & Dividends Included		Lifted out of Poverty (Difference)	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Aged 65 and over	4,141	0.096	3,879	0.090	262	0.006	3,278	0.076	2,992	0.069	286	0.007
Aged 65 to 74	2,075	0.084	1,937	0.079	138	0.005	1,823	0.074	1,665	0.067	158	0.007
Aged 75 to 84	1,373	0.103	1,302	0.098	71	0.005	1,003	0.076	924	0.070	79	0.006
Aged 85 and over	693	0.132	640	0.121	53	0.011	451	0.086	403	0.076	48	0.010

N (persons)	21,239

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : CPS PIK Sample consists of all CPS persons aged 65 and over who are assigned a Personal Identification Key (PIK) that allows linking to administrative records, but uses only survey-based income values. Linked CPS-Admin Sample is the same set of people as the CPS PIK Sample except administrative record values have replaced the survey values for five types of income: earnings, Social Security, SSI, interest and dividends, and retirement income. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. All poverty calculations with the income source "included" compare total family (or unrelated individual) income to the relevant poverty threshold which varies based on the size of the family. A person is classified as in poverty if total family income is below the threshold. Poverty is recalculated with a given income source "excluded" from total family income. The difference between the two poverty calculations results in the number and proportion of people lifted out of poverty by that income source. For more details see DeNavas-Walt et al. (2013). All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Table 12. Income quartiles and poverty by years from initial Social Security claiming

Panel A: All people

	Total Income						Share Below		Share Below		Share Below	
	25th Percentile		Median		75th Percentile		100% Poverty		200% Poverty		300% Poverty	
	CPS	Admin	CPS	Admin	CPS	Admin	CPS	Admin	CPS	Admin	CPS	Admin
Long-Run Average Earnings												
5 years before claiming	--	21,248	--	37,244	--	56,242	--	--	--	--	--	--
10	--	25,130	--	42,091	--	63,871	--	--	--	--	--	--
15	--	28,402	--	45,209	--	66,949	--	--	--	--	--	--
20	--	30,127	--	46,555	--	66,378	--	--	--	--	--	--
25	--	32,298	--	46,993	--	64,149	--	--	--	--	--	--
Year from Social Security Claim												
t-5	29,812	31,101	51,218	53,287	81,847	83,545	0.067	0.055	0.146	0.134	0.277	0.262
t-4	29,000	30,557	49,175	50,924	78,449	81,302	0.061	0.062	0.159	0.147	0.284	0.268
t-3	27,437	30,247	48,897	51,043	77,147	79,718	0.076	0.064	0.165	0.155	0.304	0.283
t-2	26,248	29,807	45,459	50,139	75,692	80,553	0.075	0.057	0.183	0.151	0.319	0.279
t-1	24,117	27,906	42,508	46,997	69,203	73,841	0.085	0.071	0.208	0.167	0.353	0.298
t	22,396	29,631	41,518	48,143	67,658	75,388	0.076	0.056	0.211	0.149	0.366	0.270
t+1	21,613	27,987	38,116	45,982	64,344	71,898	0.078	0.044	0.223	0.150	0.388	0.283
t+2	20,246	28,213	35,205	44,972	59,942	69,934	0.078	0.045	0.247	0.143	0.425	0.287
t+3	20,665	27,687	34,891	44,888	58,631	68,638	0.066	0.041	0.229	0.150	0.414	0.290
t+4	20,674	26,490	33,267	42,741	56,278	64,571	0.063	0.038	0.232	0.158	0.438	0.303
t+5	20,105	26,533	33,443	42,334	54,904	64,346	0.049	0.036	0.244	0.157	0.442	0.305

Panel B: Women

	Total Income 25th Percentile		Median		75th Percentile		Share Below 100% Poverty		Share Below 200% Poverty		Share Below 300% Poverty	
	CPS	**Admin**	**CPS**	**Admin**	**CPS**	**Admin**	**CPS**	**Admin**	**CPS**	**Admin**	**CPS**	**Admin**
Long-Run Average Earnings												
5 years before claiming	--	19,641	--	32,412	--	46,244	--	--	--	--	--	--
10	--	21,561	--	39,086	--	54,192	--	--	--	--	--	--
15	--	23,854	--	40,992	--	58,261	--	--	--	--	--	--
20	--	25,349	--	41,613	--	58,915	--	--	--	--	--	--
25	--	26,044	--	41,928	--	57,562	--	--	--	--	--	--
Year from Social Security Claim												
t-5	25,500	28,842	45,870	47,766	72,233	75,423	0.074	0.053	0.179	0.142	0.325	0.286
t-4	26,855	28,259	45,527	47,420	71,398	76,778	0.058	0.065	0.170	0.160	0.307	0.293
t-3	25,255	28,187	44,359	47,579	70,551	76,440	0.084	0.062	0.185	0.163	0.337	0.307
t-2	23,321	27,288	40,800	45,760	67,867	73,692	0.081	0.058	0.211	0.166	0.366	0.307
t-1	22,034	26,242	38,780	44,895	62,210	69,033	0.094	0.073	0.225	0.178	0.390	0.314
t	20,068	28,050	38,462	45,312	61,727	70,629	0.082	0.061	0.236	0.161	0.397	0.284
t+1	20,658	26,599	35,633	44,825	59,299	68,995	0.076	0.049	0.231	0.165	0.408	0.294
t+2	18,863	26,554	33,326	42,915	54,057	64,971	0.087	0.047	0.270	0.154	0.454	0.312
t+3	19,244	25,733	31,674	41,240	53,537	63,056	0.071	0.042	0.251	0.167	0.458	0.328
t+4	19,129	24,511	30,856	39,479	53,267	60,040	0.074	0.040	0.258	0.177	0.472	0.338
t+5	18,581	24,100	29,507	39,191	50,637	60,904	0.056	0.043	0.279	0.178	0.494	0.342

Panel C: Men

	Total Income 25th Percentile		Median		75th Percentile		Share Below 100% Poverty		Share Below 200% Poverty		Share Below 300% Poverty	
	CPS	**Admin**	**CPS**	**Admin**	**CPS**	**Admin**	**CPS**	**Admin**	**CPS**	**Admin**	**CPS**	**Admin**
Long-Run Average Earnings												
5 years before claiming	--	26,958	--	45,978	--	67,205	--	--	--	--	--	--
10	--	30,638	--	49,466	--	73,860	--	--	--	--	--	--
15	--	33,254	--	50,492	--	75,614	--	--	--	--	--	--
20	--	34,207	--	50,791	--	74,731	--	--	--	--	--	--
25	--	37,608	--	50,505	--	72,164	--	--	--	--	--	--
Year from Social Security Claim												
t-5	34,994	34,864	56,711	58,304	88,544	91,627	0.059	0.056	0.109	0.126	0.225	0.237
t-4	32,444	33,931	54,011	55,090	87,110	87,972	0.063	0.059	0.146	0.133	0.257	0.240
t-3	30,979	32,379	54,726	55,886	84,021	84,008	0.068	0.067	0.143	0.146	0.266	0.256
t-2	31,120	33,239	54,239	54,674	85,314	86,541	0.067	0.057	0.151	0.134	0.264	0.246
t-1	27,615	29,860	47,415	50,141	77,908	82,342	0.075	0.070	0.190	0.154	0.311	0.280
t	25,042	31,501	44,676	52,022	74,222	80,452	0.070	0.051	0.184	0.135	0.331	0.254
t+1	22,876	29,788	41,248	47,073	68,738	75,593	0.080	0.039	0.214	0.134	0.367	0.270
t+2	22,073	30,550	38,590	47,866	66,634	74,513	0.068	0.043	0.222	0.131	0.393	0.260
t+3	22,486	30,852	39,401	48,675	64,054	74,285	0.059	0.039	0.206	0.132	0.366	0.249
t+4	22,079	29,434	35,956	45,811	59,980	68,593	0.050	0.036	0.203	0.138	0.401	0.265
t+5	22,189	29,517	37,556	45,083	59,926	67,529	0.041	0.029	0.207	0.135	0.388	0.268

Source : 1999-2013 CPS ASEC linked to SSA and IRS administrative records.

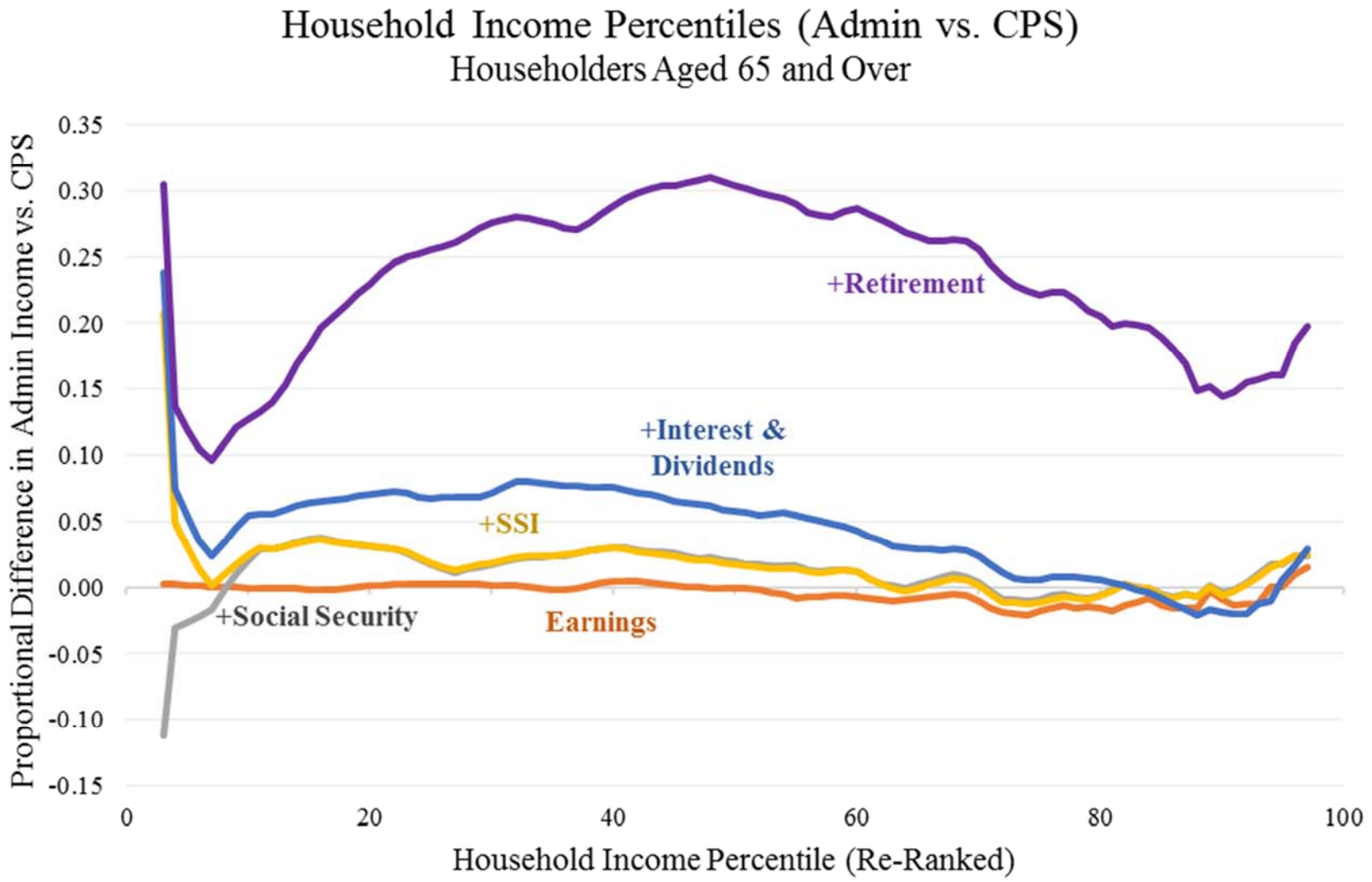
Notes : We draw comparable individuals in each linked CPS-ASEC sample for our synthetic cohort analysis. Panel A shows results for the full population, panel B for women, and panel C for men. From each year of linked CPS ASEC data, we select individuals who are assigned a Protection Identification Key (PIK) that allows linking to administrative records, who, according to the administrative records, first claimed Social Security between 2003 and 2007, who were age 60 to 70 when first claiming, who did not claim disability benefits and who survived for at least five years after claiming. Individuals who first claimed in 2003 are drawn from the 1999 CPS ASEC to cover time t-5, from the 2000 CPS ASEC to cover time t-4, from the 2001 CPS ASEC to cover time t-3, etc. We pool all the claimants between 2003 and 2007 to estimate each of the eleven time periods surrounding the year Social Security is claimed. If individuals are married in a particular year we assign individuals in our sample the pooled incomes of both spouses and equivalence adjust using the Betson Scale. All income figures are inflation-adjusted using the CPI-U-RS and expressed in 2012 dollar. We report the 25th, 50th, and 75th percentiles of real, equivalized incomes in each year using both survey values and the administrative records.

Long-run average earnings are calculated as the 5, 10, 15, 20, or 25 year of earnings prior to claiming. For individuals who are married, both spouses' long-run earnings are pooled and equivalence adjusted. We take the average of long-run earnings for individuals near the specified income percentile. For example, for median incomes, we average long-run earnings for individuals with income between the 45th and 55th percentile. All long-run earnings calculations are based on the t-5 sample.

We calculate using both the survey and the administrative records the share of the sample below 100, 200 and 300 percent of poverty by comparing the individual's total family (or unrelated individual) income to the relevant poverty threshold which varies based on family size. For more details on poverty calculations, see Denavas-Walt (2013).

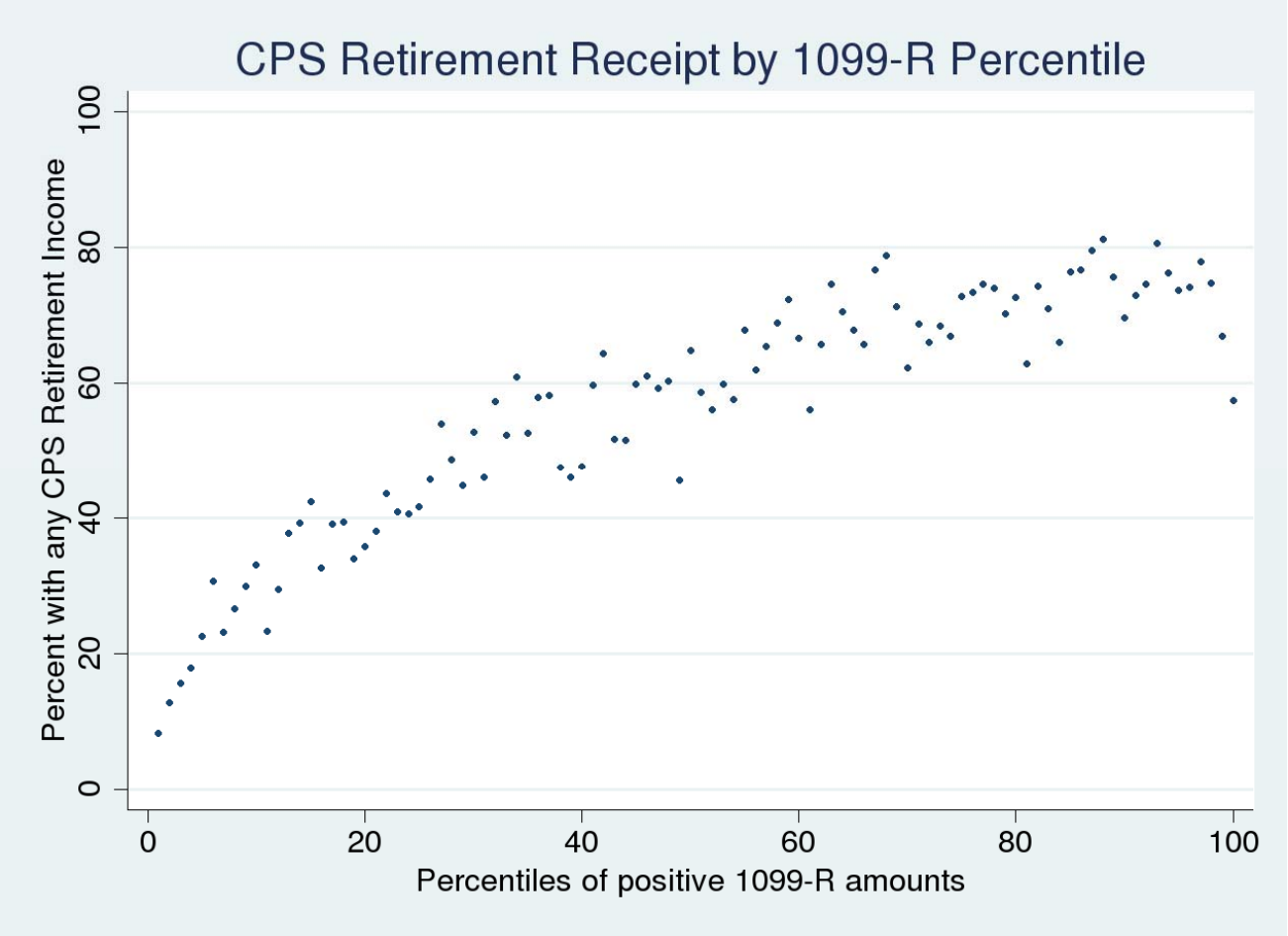
All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Figure 1. Household income distributions, cumulatively substituting one administrative record source at a time: 2012



Source: 2013 CPS ASEC linked to SSA and IRS administrative records.
Notes: See Table 4 notes for description.

Figure 2. CPS ASEC retirement receipt by Form 1099-R amount percentile: 2012

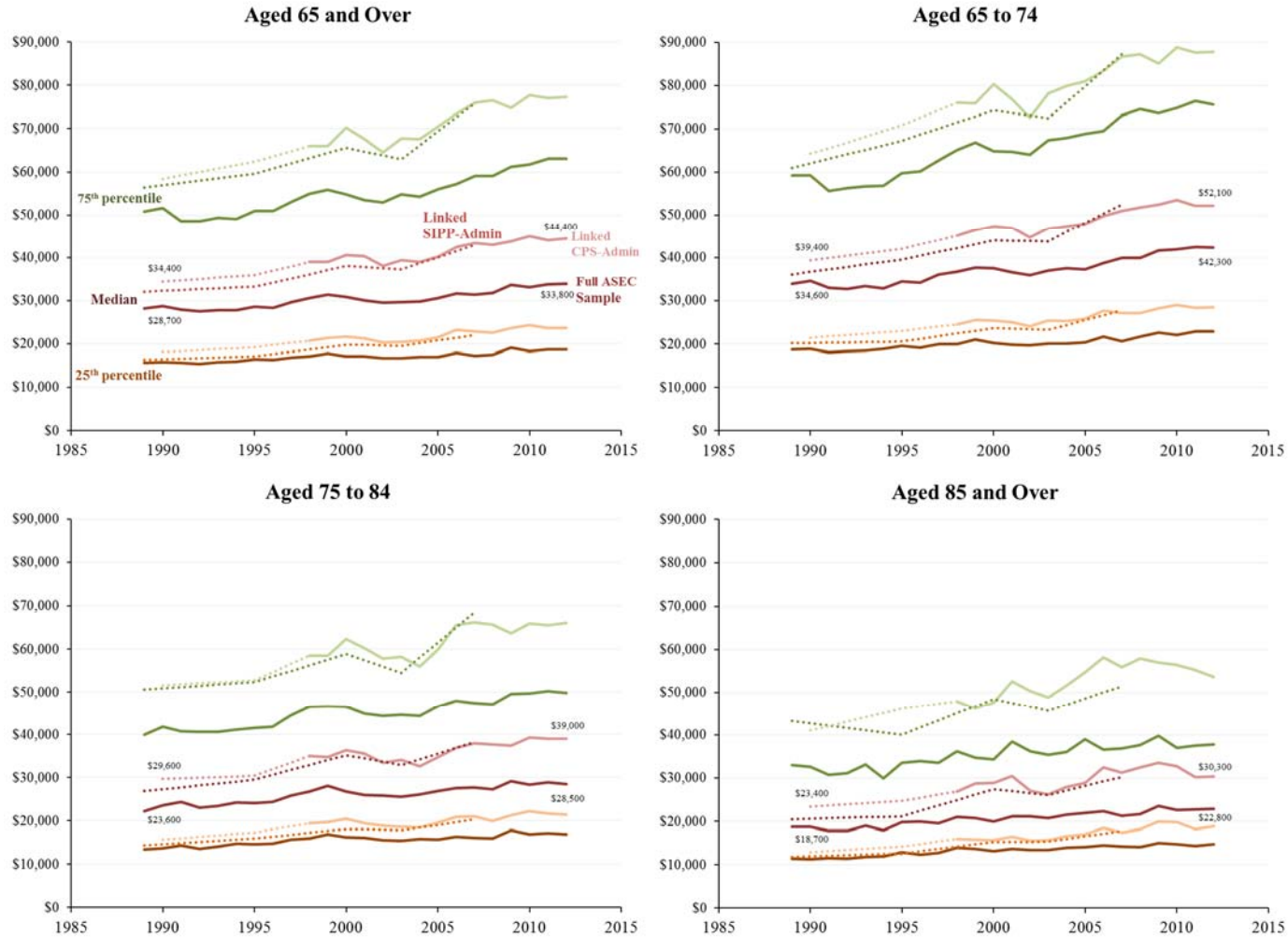


Source: 2013 CPS ASEC linked to IRS Form 1099-R records.

Notes: Sample consists of all persons aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records, who have positive 1099-R income, and who have non-imputed survey responses for retirement income. Individuals are ranked based on percentile of 1099-R income (x-axis). For each percentile, the mean survey-based rate of retirement income receipt (y-axis) is calculated. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals.

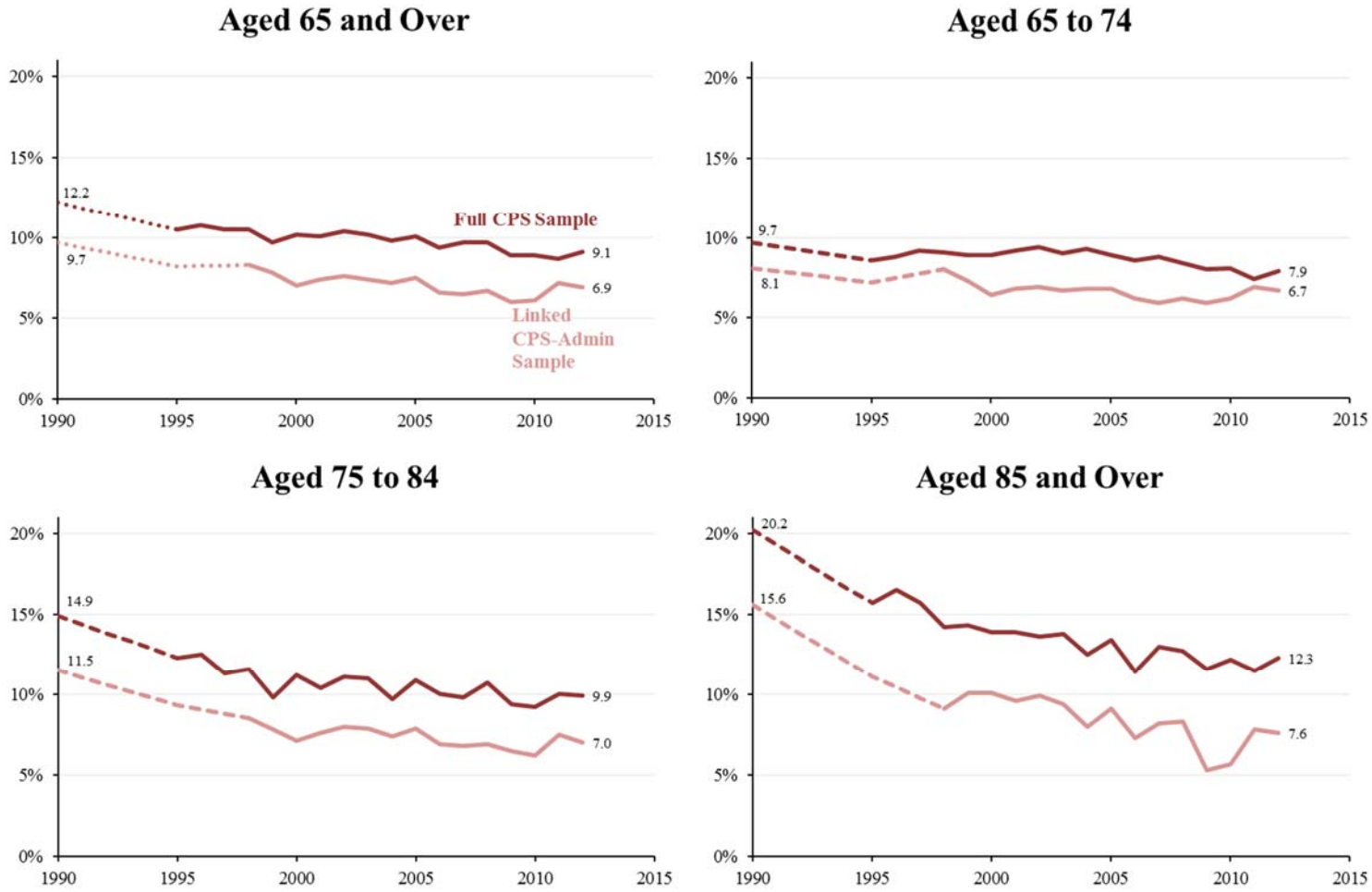
All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Figure 3. Historical trends in household income quartiles (2012 dollars)



Source: 1991, 1996, and 1999-2013 CPS ASEC; and 1990, 1996, 2001, 2004, and 2008 SIPP panels (Wave 1) linked to SSA and IRS administrative records.
Notes: Sample consists of all householders aged 65 and over, and the two linked samples further require that householders are assigned a Protection Identification Key (PIK) that allows linking to administrative records. Each panel plots the 25th, 50th, and 75th, percentile of household incomes from both the survey (Full CPS Sample) and the administrative records (Linked CPS-Admin Sample and Linked SIPP-Admin Sample).
All estimates make use of CPS or SIPP final household weights. For the linked samples, we adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS/SIPP demographic characteristics and predict the propensity score. We then take the CPS/SIPP sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Figure 4. Historical trends in poverty rates

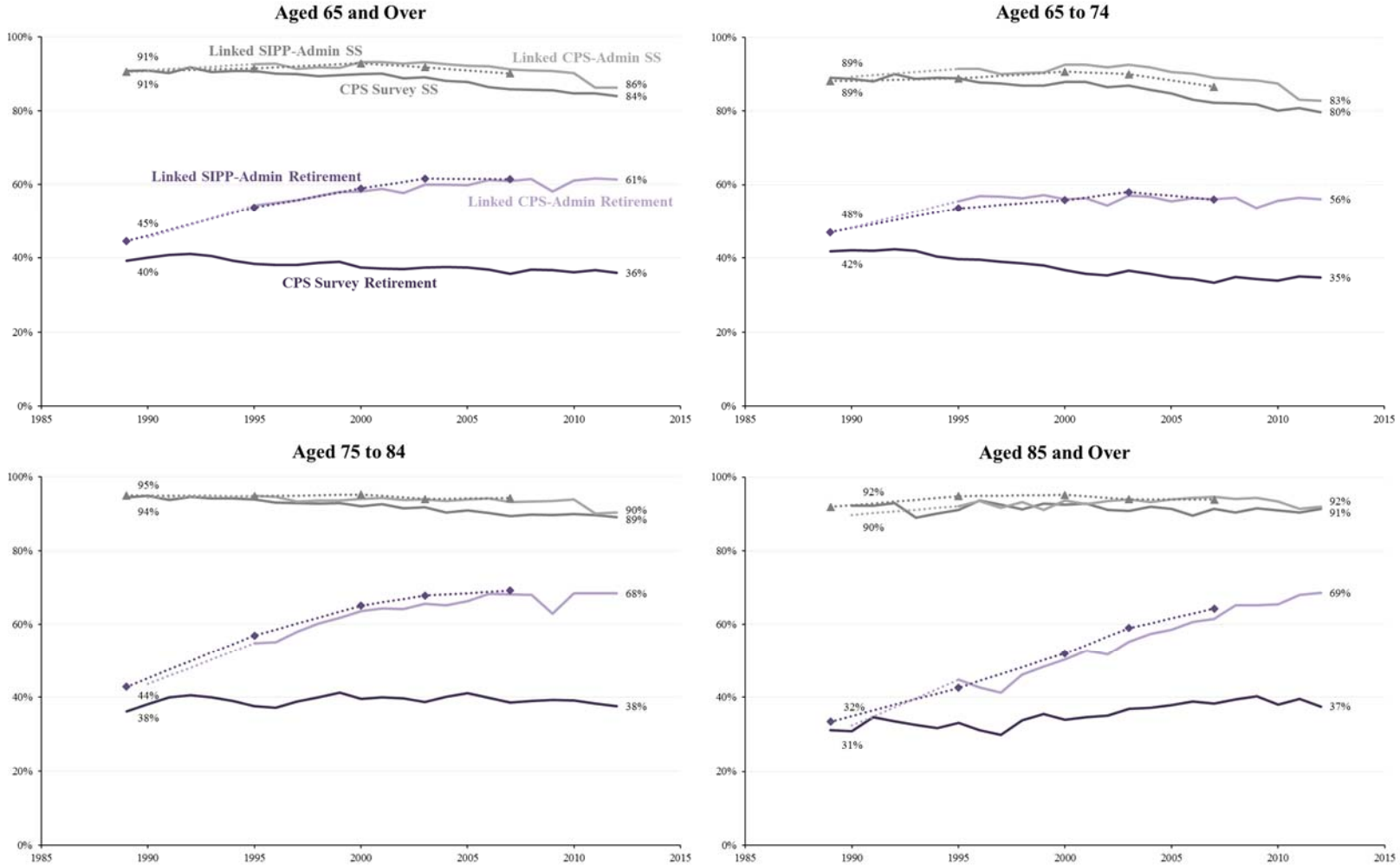


Source: 1991, 1996, 1999-2013 CPS ASEC linked to SSA and IRS administrative records.

Notes: Sample consists of all persons aged 65 and over, and the linked sample further requires that persons are assigned a Protection Identification Key (PIK) that allows linking to administrative records. Each panel plots the poverty rate from both the survey (Full CPS Sample) and the administrative records (Linked CPS-Admin Sample). Poverty status is calculated by comparing the individual's total family (or unrelated individual) income to the relevant poverty threshold which varies based on family size. For more details on poverty calculations, see Denavas-Walt (2013).

All estimates make use of CPS final person weights. For the linked sample, we adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Figure 5. Historical trends in receipt rates of Social Security and retirement income



Source: 1991, 1996, 1999-2013 CPS ASEC; and 1990, 1996, 2001, 2004, and 2008 SIPP panels (Wave 1) linked to SSA and IRS administrative records.
Notes: Sample consists of all persons aged 65 and over, and the linked samples further require that persons are assigned a Protection Identification Key (PIK) that allows linking to administrative records. Each panel plots the rate of Social Security and retirement income receipt from both the survey (Full CPS Sample) and the administrative records (Linked CPS-Admin Sample and Linked-SIPP Admin Sample). Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals.
All estimates make use of CPS or SIPP final person weights. For the linked sample, we adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of survey demographic characteristics and predict the propensity score. We then take the survey sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 1. Correspondence between CPS ASEC variables and administrative record income sources

Income Type	CPS ASEC Variables	Administrative Record Source
Earnings	WSAL_VAL, SEMP_VAL, FRSE_VAL	SSA DER wages and self-employment
Social Security	SS_VAL	SSA PHUS OASDI benefits
SSI	SSI_VAL	SSA SSR federal and state benefits
Interest and dividends	INT_VAL, DIV_VAL	IRS Form 1040 dividends, taxable and tax-exempt interest
Retirement income	RTM_VAL, SRVS_VAL, DSAB_VAL, VET_VAL (pensions, survivor, disability)	IRS Form 1099-R employer-sponsored and IRA

Notes : CPS ASEC other income (OI_VAL) also allocated among survey income types.

Appendix Table 2. Quantile regression of survey- and administrative-record-reported median household income, aged 65 and over: 2012

Independent variables	(1) Survey Median	(2) Admin Median
Disabled	-3,104***	-6,558***
	(514)	(652)
Homeowner	5,594***	9,674***
	(622)	(788)
Veteran	4,863***	3,848***
	(783)	(863)
Race and Hispanic Origin (White, not Hispanic omitted)		
Black, not Hispanic	-3,520***	-3,126***
	(717)	(955)
Asian, not Hispanic	-1,115	-2,211
	(1,602)	(2,024)
Other race, not Hispanic	-5,435**	-4,659
	(2,548)	(4,270)
Hispanic, any race	-6,059***	-6,311***
	(987)	(1,214)
Education (Less than high school omitted)		
High school graduate	3,933***	5,260***
	(544)	(693)
Some college	7,768***	11,684***
	(675)	(949)
College graduate	26,498***	36,696***
	(1,439)	(1,410)
Nativity (US born omitted)		
Foreign born	-2,446***	-4,703***
	(816)	(1,245)
Marital Status (Married omitted)		
Married, spouse absent	-10,061***	-13,064***
	(2,536)	(3,034)
Widowed	-5,457***	-8,356***
	(1,360)	(1,513)
Divorced	-8,572***	-12,530***
	(1,334)	(1,529)
Separated	-10,087***	-11,093***
	(2,539)	(2,899)
Never married	-9,673***	-11,679***
	(1,567)	(1,746)
Region (Northeast omitted)		
Midwest	-149	-2,369**
	(769)	(953)
South	-2,553***	-5,063***
	(730)	(886)
West	23	-2,516**
	(916)	(1,144)

Appendix Table 2, continued. Quantile regression of survey- and administrative-record-reported median household income, aged 65 and over: 2012

Independent variables	(1) Survey Median	(2) Admin Median
Metropolitan Area (Principal cities omitted)		
Outside principal cities	-322	-232
	(661)	(779)
Outside MSAs	-3,548***	-6,232***
	(722)	(776)
Retirement income imputed	-2,135***	1,793*
	(645)	(1,072)
Month in Sample (MIS 1 omitted)		
MIS 2	867	476
	(1,248)	(1,110)
MIS 3	671	1,010
	(1,168)	(1,317)
MIS 4	-1,045	-728
	(1,091)	(1,127)
MIS 5	-399	280
	(1,124)	(1,017)
MIS 6	-731	-644
	(1,036)	(1,183)
MIS 7	-915	25
	(1,155)	(1,148)
MIS 8	-51	13
	(978)	(1,310)
Household Size (One person omitted)		
Two persons	12,868***	14,899***
	(1,011)	(1,212)
Three or more persons	32,973***	32,734***
	(1,857)	(1,911)
Constant	30,341***	33,468***
	(2,054)	(2,208)
Age fixed effects	Y	Y
N (households)	13,656	13,656
R-squared	0.191	0.197

Source : 2013 CPS ASEC linked to SSA and IRA administrative records.

Notes : *** p<0.01, ** p<0.05, * p<0.10. Sample consists of all householders aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records. Column (1) estimates a median regression model of total survey household income on the full set of demographic characteristics examined in Table 2. The model in column (2) is the same except the dependent variable is total household income as measured in the administrative records. "Retirement income imputed" includes both item and whole-supplement imputations. "Birthplace missing" is included as a control but coefficient suppressed due to small cell size.

All estimates make use of CPS final household weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 3. Linear probability model of survey- and administrative-record-reported poverty, aged 65

Independent variables	(1) **Survey Poor**	(2) **Admin Poor**
Female	0.012**	0.008*
	(0.005)	(0.004)
Householder	0.013***	0.011***
	(0.003)	(0.003)
Disabled	0.016**	0.044***
	(0.006)	(0.006)
Homeowner	-0.083***	-0.112***
	(0.010)	(0.010)
Veteran	-0.018***	-0.016***
	(0.005)	(0.004)
Race and Hispanic Origin (White, not Hispanic omitted)		
Black, not Hispanic	0.061***	0.029***
	(0.009)	(0.008)
Asian, not Hispanic	0.022	0.003
	(0.020)	(0.019)
Other race, not Hispanic	0.106**	0.071
	(0.041)	(0.051)
Hispanic, any race	0.077***	0.057***
	(0.014)	(0.011)
Education (Less than high school omitted)		
High school graduate	-0.077***	-0.077***
	(0.009)	(0.008)
Some college	-0.100***	-0.090***
	(0.009)	(0.008)
College graduate	-0.106***	-0.095***
	(0.008)	(0.008)
Nativity (US born omitted)		
Foreign born	0.028**	0.061***
	(0.012)	(0.012)
Marital Status (Married omitted)		
Married, spouse absent	0.119***	0.113***
	(0.032)	(0.030)
Widowed	0.009	0.023***
	(0.009)	(0.008)
Divorced	0.035***	0.046***
	(0.010)	(0.009)
Separated	0.106***	0.113***
	(0.034)	(0.034)
Never married	0.070***	0.071***
	(0.015)	(0.016)

Appendix Table 3, continued. Linear probability model of survey- and administrative-record-reported poverty, aged 65 and over: 2012

Independent variables	(1) Survey Poor	(2) Admin Poor
Region (Northeast omitted)		
Midwest	-0.008	-0.006
	(0.008)	(0.006)
South	0.019***	0.016**
	(0.007)	(0.006)
West	0.001	0.004
	(0.007)	(0.007)
Metropolitan Area (Principal cities omitted)		
Outside principal cities	-0.018**	-0.017***
	(0.008)	(0.007)
Outside MSAs	0.001	0.018**
	(0.006)	(0.006)
Retirement income imputed	0.008	-0.006
	(0.006)	(0.005)
Month in Sample (MIS 1 omitted)		
MIS 2	-0.016	-0.008
	(0.011)	(0.009)
MIS 3	-0.011	-0.001
	(0.009)	(0.008)
MIS 4	0.002	0.006
	(0.010)	(0.009)
MIS 5	-0.016*	-0.007
	(0.010)	(0.008)
MIS 6	-0.007	-0.005
	(0.010)	(0.010)
MIS 7	-0.007	-0.008
	(0.010)	(0.009)
MIS 8	-0.007	0.003
	(0.010)	(0.008)

Appendix Table 3, continued. Linear probability model of survey- and administrative-record-reported poverty, aged 65 and over: 2012

Independent variables	(1) Survey Poor	(2) Admin Poor
Household Size (One person omitted)		
Two persons	-0.054***	-0.036***
	(0.009)	(0.008)
Three or more persons	-0.064***	-0.049***
	(0.009)	(0.009)
Constant	0.258***	0.233***
	(0.018)	(0.017)
Age fixed effects	Y	Y
N (persons)	21,239	21,239
R-squared	0.106	0.145

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : *** p<0.01, ** p<0.05, * p<0.10. Sample consists of all persons aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records. Column (1) estimates a linear probability model of survey-based poverty status on the full set of demographic characteristics examined in Table 3. "Retirement income imputed" includes both item and whole-supplement imputations. "Birthplace missing" is included as a control but coefficient suppressed due to small cell size. Poverty status is determined by comparing total family (or unrelated individual) income to the relevant poverty threshold which varies by family size. A person is classified as in poverty if total family income is below the threshold. For more details see DeNavas-Walt et al. (2013). The model in column (2) is the same except the dependent variable is poverty status as measured in the administrative records.

All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 4. Proportion of persons aged 65 and over who receive designated number of 1099-Rs in TY 2012

	Number of 1099-Rs				Number of Employer-Sponsored 1099-Rs				Number of IRA 1099-Rs			
	1+	1	2	3+	1+	1	2	3+	1+	1	2	3+
Aged 65 and over	0.613	0.315	0.170	0.128	0.498	0.330	0.121	0.048	0.284	0.211	0.052	0.022
Aged 65-74	0.560	0.310	0.148	0.102	0.462	0.316	0.109	0.038	0.227	0.166	0.045	0.016
Aged 75-84	0.684	0.314	0.203	0.168	0.536	0.345	0.134	0.057	0.384	0.282	0.068	0.035
Aged 85 and over	0.685	0.343	0.192	0.150	0.577	0.360	0.147	0.070	0.306	0.249	0.043	0.014
N (persons)	21,239											

Source : 2013 CPS-ASEC linked to SSA and IRS administrative records.

Notes : Sample consists of all persons aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records.

All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 5. Decomposition of intensive and extensive margins of retirement income misreporting, excluding imputed cases

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Proportion of Total Difference from each Replacement			
	CPS Baseline	Replace False Positives	+Replace True Positives	+Replace False Negatives	False Positives	True Positives	False Negatives	+Replace All Other Admin
Household income amounts, householders aged 65 and over								
5th	8,666	8,437	8,508	9,694	-0.223	0.069	1.154	9,451
10th	11,709	11,451	11,550	12,952	-0.207	0.080	1.128	12,936
25th	18,901	18,452	19,035	22,267	-0.133	0.173	0.960	23,374
Median	34,275	33,585	36,247	42,294	-0.086	0.332	0.754	43,835
75th	63,603	62,790	68,357	76,881	-0.061	0.419	0.642	76,675
90th	107,745	107,097	114,566	124,924	-0.038	0.435	0.603	122,836
95th	144,761	144,452	154,366	167,262	-0.014	0.441	0.573	167,561
Mean	51,737	51,099	55,444	62,602	-0.059	0.400	0.659	65,829
Proportions below specified income-to-poverty ratios, people aged 65 and over								
0-50%	0.026	0.028	0.027	0.018	-0.249	0.066	1.184	0.015
0-100%	0.089	0.095	0.092	0.072	-0.304	0.145	1.159	0.071
0-150%	0.208	0.216	0.207	0.161	-0.159	0.179	0.980	0.150
0-200%	0.333	0.342	0.326	0.256	-0.125	0.213	0.911	0.239
Retirement income amounts (unconditional), persons aged 65 and over								
Median	1,844	1,789	1,835	3,045	-0.046	0.038	1.008	-
Mean	6,652	6,243	9,173	13,947	-0.056	0.402	0.654	-
N (Households)	11,657							
N (Persons)	18,032							

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.

Notes : Sample excludes imputed cases. The top section of the table analyzes household income quantiles. The CPS PIK Sample (Baseline Values) in column 1 consists of all CPS households with a householder aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records, but uses only survey-based values to calculate household income quantiles. Each of the next three columns maintains the same set of households but uses the 1099-R administrative records to correct for one type of retirement income misreporting. After each correction, households are re-ranked based on the new measure of income. Corrections are made in a cumulative fashion. Column 2 replaces false positives with zeros, column 3 swaps the amounts in the survey for the amounts in the administrative records among those with positive amounts in both sources, and column 4 replaces the false negative reports with the amounts from the administrative records. Columns 5 through 7 compute the percentage of the overall change (relative to column 1) that is attributable to each type of misreporting. To put retirement income in context, column 8 then swaps the other four sources of survey income for their administrative record counterparts. The other four sources of income are: earnings, Social Security, SSI, and interest and dividends.

The second section of the table performs the same exercise for the proportion of persons aged 65 and over (with a PIK) that are below specified intervals of the income-to-poverty ratio. An income-to poverty ratio is calculated as a person's total family (or unrelated individual) income divided by the relevant poverty threshold which varies based on family size. See DeNavas-Walt et al. (2013) for more details. The third section of the table performs the same exercise for persons aged 65 and over (with a PIK) but examines the unconditional mean and median amounts of retirement income.

All estimates make use of CPS final household/person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 6. Comparisons of survey and administrative record values at the extensive and intensive margins, persons aged 65 and older: 2012

Panel A: Including all survey values

	Extensive Margin (rate of receipt)		Intensive Margin (amount, conditional on receipt)
Income source	CPS Receipt	Admin Receipt	Log-Log Correlation Coefficient
Earnings	0.216	0.251	0.717
Social Security (SS)	0.853	0.863	0.561
SSI	0.027	0.045	0.600
Interest and dividends	0.490	0.614	0.459
Retirement income (total)	0.366	0.613	0.534
Retirement income (employer-sponsored)	0.331	0.499	0.608
N (persons)		21,239	

Panel B: Excluding imputed survey values

	Extensive Margin (rate of receipt)		Intensive Margin (amount, conditional on receipt)
Income source	CPS Receipt	Admin Receipt	Log-Log Correlation Coefficient
Earnings	0.166	0.214	0.854
Social Security (SS)	0.819	0.845	0.757
SSI	0.024	0.044	0.691
Interest and dividends	0.311	0.499	0.647
Retirement income (total)	0.305	0.585	0.699
Retirement income (employer-sponsored)	0.277	0.464	0.782
N (persons)		18,032	

Source : 2013 CPS ASEC linked to SSA and IRS administrative records.
Notes : Sample consists of all persons aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records. Panel A includes all survey values while Panel B further excludes those with imputed values (both item and full-supplement) for each income source. “Retirement income (total)” includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. “Retirement income (employer-sponsored)” excludes IRA withdrawals. “CPS Receipt” refers to the survey-based measure of proportion of sample with a positive amount of each income source. “Admin Receipt” refers to the administrative record-based measure of proportion of sample with a positive amount of each income source. “Log-Log Correlation Coefficient” is the Pearson correlation coefficient of the log of the survey and administrative record-based amounts of each income source for those who have at least one dollar in both data sources.
All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 7. ACS retirement income recipiency by data source: 2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	True Negative	False Positive	False Negative	True Positive	Total ACS Receipt (2)+(4)	Total Linked ACS-Admin Receipt (3)+(4)	False Negative Rate (3)/((3)+(4))
PEOPLE AGED 65 AND OVER							
Total	0.365	0.036	0.263	0.336	0.372	0.599	0.439
Race and Hispanic Origin							
White	0.341	0.033	0.275	0.351	0.384	0.626	0.439
White, not Hispanic	0.320	0.032	0.283	0.365	0.397	0.648	0.437
Black	0.409	0.054	0.215	0.322	0.376	0.537	0.400
Asian	0.605	0.040	0.182	0.173	0.213	0.355	0.513
Hispanic (any race)	0.602	0.048	0.174	0.176	0.224	0.350	0.497
Sex							
Male	0.302	0.037	0.264	0.397	0.434	0.661	0.399
Female	0.414	0.036	0.262	0.288	0.324	0.550	0.476
Age							
Aged 65 to 74	0.414	0.039	0.232	0.315	0.354	0.547	0.424
Aged 75 to 84	0.299	0.031	0.307	0.362	0.393	0.669	0.459
Aged 85 and over	0.296	0.034	0.301	0.369	0.403	0.670	0.449
Nativity							
Native born	0.329	0.035	0.274	0.363	0.398	0.637	0.430
Foreign born							
Naturalized	0.537	0.042	0.226	0.195	0.237	0.421	0.537
Not a citizen	0.781	0.052	0.098	0.069	0.121	0.167	0.589
Region							
Northeast	0.340	0.033	0.282	0.345	0.378	0.627	0.450
Midwest	0.311	0.030	0.292	0.367	0.397	0.659	0.443
South	0.388	0.040	0.250	0.323	0.363	0.573	0.436
West	0.400	0.038	0.241	0.321	0.359	0.562	0.429
Residence							
Inside metropolitan statistical areas	0.361	0.036	0.264	0.339	0.375	0.603	0.438
Outside metropolitan statistical areas	0.411	0.038	0.249	0.301	0.339	0.550	0.453
Disability Status							
With a disability	0.389	0.041	0.246	0.324	0.365	0.570	0.432
With no disability	0.351	0.033	0.273	0.343	0.376	0.616	0.443
Educational Attainment							
Less than high school diploma	0.559	0.041	0.204	0.196	0.237	0.400	0.510
High school graduate	0.358	0.036	0.286	0.320	0.356	0.606	0.472
Some college	0.327	0.036	0.275	0.361	0.397	0.636	0.432
College graduate	0.259	0.033	0.266	0.443	0.476	0.709	0.375

Appendix Table 7, continued. ACS retirement income recipiency by data source: 2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	True Negative	False Positive	False Negative	True Positive	Total ACS Receipt (2)+(4)	Total Linked ACS-Admin Receipt (3)+(4)	False Negative Rate (3)/((3)+(4))
Marital status							
Married	0.360	0.032	0.274	0.334	0.366	0.608	0.451
Widowed	0.323	0.041	0.268	0.368	0.409	0.636	0.421
Divorced	0.423	0.041	0.229	0.307	0.348	0.536	0.427
Separated	0.575	0.052	0.171	0.201	0.253	0.372	0.460
Never married	0.436	0.043	0.216	0.304	0.347	0.520	0.415
Housing Tenure							
Owner households with mortgage	0.372	0.039	0.238	0.351	0.390	0.589	0.404
Owner households without mortgage	0.300	0.030	0.303	0.367	0.397	0.670	0.452
Renter households	0.529	0.047	0.197	0.227	0.274	0.424	0.465
Veteran Status							
Veteran or Armed Forces	0.220	0.038	0.271	0.470	0.508	0.741	0.366
Not a veteran, male	0.374	0.036	0.258	0.332	0.368	0.590	0.437
Not a veteran, female	0.415	0.035	0.262	0.287	0.322	0.549	0.477
Householder							
Householder	0.305	0.035	0.271	0.389	0.424	0.660	0.411
Not a householder	0.464	0.038	0.250	0.249	0.287	0.499	0.501
Imputation Status							
Retirement income imputed	0.206	0.122	0.246	0.426	0.548	0.672	0.366
Retirement income not imputed	0.395	0.019	0.266	0.319	0.338	0.585	0.455
Household Size							
One-person household	0.311	0.036	0.273	0.380	0.416	0.653	0.418
Two-person household	0.342	0.032	0.280	0.346	0.378	0.626	0.447
Three-person household	0.441	0.043	0.225	0.291	0.334	0.516	0.436
Four-or-more-person household	0.502	0.048	0.203	0.247	0.295	0.450	0.451
Mode							
Mail	0.332	0.040	0.280	0.348	0.388	0.628	0.446
Telephone	0.384	0.028	0.252	0.337	0.365	0.589	0.428
In-person	0.500	0.041	0.229	0.230	0.271	0.459	0.499
Internet	0.322	0.030	0.264	0.385	0.415	0.649	0.407
Type of 1099-R							
IRA only	0.000	0.000	0.824	0.176	0.176	1.000	0.824
Employer-sponsored only	0.000	0.000	0.356	0.644	0.644	1.000	0.356
Both types	0.000	0.000	0.354	0.646	0.646	1.000	0.354

Appendix Table 7, continued. ACS retirement income recipiency by data source: 2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	True Negative	False Positive	False Negative	True Positive	Total ACS Receipt (2)+(4)	Total Linked ACS-Admin Receipt (3)+(4)	False Negative Rate (3)/((3)+(4))
Quintiles of 1099-R Amounts (Conditional >0)							
1	0.000	0.000	0.672	0.328	0.328	1.000	0.672
2	0.000	0.000	0.505	0.495	0.495	1.000	0.505
3	0.000	0.000	0.402	0.598	0.598	1.000	0.402
4	0.000	0.000	0.320	0.680	0.680	1.000	0.320
5	0.000	0.000	0.297	0.703	0.703	1.000	0.297
N (persons)					819,115		

Source : 2013 American Community Survey linked to 2012 IRS 1099-R records.

Notes : Sample consists of all ACS persons aged 65 and over (excluding those in group quarters) who are assigned a Personal Identification Key (PIK) that allows linking to administrative records. Retirement income includes retirement, survivor, and disability pensions (excluding Social Security) as well as defined contribution account withdrawals. “True negative” refers to the proportion of the sample who have zero administrative record retirement income and report zero retirement income in the survey. “False positive” refers to the proportion of the sample with zero administrative record income but report positive income in the survey. “False negative” refers to the proportion of the sample with positive administrative record income but report zero income in the survey. “True positive” refers to the proportion of the sample with positive administrative record income and report positive income in the survey.

All estimates make use of ACS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of ACS demographic characteristics and predict the propensity score. We then take the ACS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 8. Statistics among persons receiving 1099-Rs from specific payers: 2012

	(1) Any ES	(2) Fed CSRS	(3) Military	(4) CalPERS	(5) CalSTRS	(6) Any IRA
CPS Retirement Receipt	0.653	0.751	0.785	0.859	0.760	0.473
CPS Median Household Income	43,671	45,999	52,626	58,500	78,315	44,266
Admin Median Household Income	58,313	63,759	64,694	75,773	104,234	65,026
Admin/CPS Ratio	1.335	1.386	1.229	1.295	1.331	1.469
CPS Poverty Rate	0.051	0.089	--	--	--	0.041
Admin Poverty Rate	0.013	0.013	--	--	--	0.005
Admin-CPS Difference	-0.038	-0.076	-0.035	-0.029	-0.021	-0.036
N (persons)	8,961	819	534	144	48	4,902

Source : 2013 CPS ASEC linked to IRS administrative records.

Notes : Sample consists of all persons aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records, who have a non-imputed survey response for retirement income, and who receive 1099-R retirement income from one of six specific sources. The six specific sources are: any employer-sponsored, the Federal Civil Service Retirement System (CSRS), the Military Retirement Fund, the California Public Employees Retirement System (CalPERS), and the California State Teachers Retirement System (CalSTRS), and any IRA. Persons may have 1099-R income from other sources as well. Some cells suppressed to preserve confidentiality.

All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 9. Comparisons of Census 1099-R extract file to IRS published aggregates

Panel A: 1099-R distributions for filers aged 55 and over in tax year 2010 (billions of dollars)

	Argento, Bryant, and Sabelhaus (2015)	Linked CPS-Admin Sample
Gross Distributions	1,040	
less Direct Rollovers	-199	
less Section 1035 Exchanges	-20	
less Roth Conversions	-31	
Remainder	**790**	**770**

Panel B: Aggregate amount of 1099-R distributions in tax year 2012 (billions of dollars)

(1) Total Linked CPS-Admin Sample	(2) Filers Linked CPS-Admin Sample	(3) SOI Taxable	(4) SOI Total	(2)/(3)	(2)/(4)
992	938	843	1,247	111%	75%

Source : 2011 and 2013 CPS ASEC linked to IRS Form 1099-R records.

Notes : In panel A, the Linked CPS-Admin sample consists of all persons from the 2011 CPS ASEC aged 55 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records and who filed a 1040 in tax year 2010. The aggregate gross distributions from the Census Bureau extract of IRS Form 1099-R is reported for this sample. This number is compared with the analogous number reported in Argento, Bryant, and Sabelhaus (2015).

In panel B, the Total Linked CPS-Admin sample consists of all persons from the 2013 CPS ASEC (regardless of age) who are assigned a Protection Identification Key (PIK). The Filers Linked CPS-Admin sample further restricts to those who filed a 1040 in tax year 2012. The aggregate gross distributions from the Census Bureau extract of IRS Form 1099-R are reported and compared with taxable and total distributions. These are derived from published aggregates of lines 15 and 16 of IRS Form 1040 and reported in SOI Table A.

All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 10. Receipt of retirement income in consecutive years

Panel A: 1099-R employer-sponsored income

		Conditional on Employer-Sponsored 1099-R TY2012 >0			
Proportion of People	Any 1099-R ES TY2012	Any 1009-R ES TY2013	TY2012-2013 Decrease more than 10%	TY2012-2013 Change Within 10%	TY2012-2013 Increase more than 10%
Age 25-34	0.04	0.21	0.89	0.03	0.08
Age 35-44	0.06	0.32	0.81	0.07	0.13
Age 45-54	0.08	0.52	0.59	0.30	0.11
Age 55-64	0.21	0.85	0.27	0.58	0.15
Age 65-74	0.46	0.95	0.12	0.78	0.11
Age 75-84	0.54	0.98	0.07	0.86	0.06
Age 85+	0.58	0.97	0.10	0.83	0.07
Age 65+	0.50	0.96	0.10	0.81	0.09
N (persons)	113,292	18,760			

Panel B: 1099-R IRA income

		Conditional on IRA TY2012 >0			
Proportion of People	Any 1099-R IRA TY2012	Any 1099-R IRA TY2013	TY2012-2013 Decrease more than 10%	TY2012-2013 Change Within 10%	TY2012-2013 Increase more than 10%
Age 25-34	0.02	0.23	0.87	0.04	0.09
Age 35-44	0.03	0.38	0.79	0.04	0.17
Age 45-54	0.04	0.45	0.73	0.08	0.19
Age 55-64	0.08	0.61	0.58	0.16	0.26
Age 65-74	0.23	0.87	0.33	0.35	0.32
Age 75-84	0.39	0.97	0.15	0.53	0.32
Age 85+	0.31	0.97	0.13	0.62	0.25
Age 65+	0.29	0.92	0.23	0.46	0.31
N (persons)	113,292	9,134			

Panel C: All 1099-R income

		Conditional on Receiving a 1099-R in TY2012			
Proportion of People	Any 1099-R TY2012	Any 1099-R TY2013	TY2012-2013 Decrease more than 10%	TY2012-2013 Change Within 10%	TY2012-2013 Increase more than 10%
Age 25-34	0.06	0.24	0.87	0.03	0.10
Age 35-44	0.08	0.38	0.78	0.06	0.16
Age 45-54	0.11	0.55	0.62	0.22	0.16
Age 55-64	0.26	0.82	0.34	0.45	0.22
Age 65-74	0.56	0.95	0.19	0.60	0.22
Age 75-84	0.69	0.98	0.11	0.72	0.17
Age 85+	0.69	0.98	0.12	0.75	0.13
Age 65+	0.61	0.97	0.15	0.66	0.19
N (persons)	113,292	23,675			

Source : 2013 CPS ASEC linked to IRS Form 1099-R records.

Notes : Sample consists of all persons aged 65 and over who are assigned a Protection Identification Key (PIK) that allows linking to administrative records. Panel A shows results for 1099-R employer-sponsored, Panel B shows results for 1099-R IRA, and Panel C shows results for all 1099-R income. The first column of each panel shows the rate of 1099-R receipt in 2012. Columns 2 through 5 condition on positive amounts of 1099-R income in 2012. All estimates make use of CPS final person weights. We adjust the weights to account for selection into having a PIK. We first estimate a logit model for the presence of a PIK as a function of CPS demographic characteristics and predict the propensity score. We then take the CPS sample weight and multiply it by the inverse of the propensity score. The resulting weights are used in the analysis.

Appendix Table 11. Average shares of income from various income across Aged Unit income distribution, aged 75 and over: 2012

Panel A: CPS income shares

						Retirement Income					
CPS Aged Unit Income Decile	**Mean CPS Income**	**Earnings**	**Social Security**	**SSI**	**Interest and Dividends**	Total	D.B.	IRA	Non-IRA D.C.	Unknown	**Other Income**
1	6,163	0.00	0.75	0.11	0.05	0.06	--	--	--	--	0.03
2	10,830	0.01	0.89	0.05	0.01	0.04	--	--	--	--	0.00
3	13,845	0.01	0.91	0.01	0.01	0.06	--	--	--	--	0.01
4	16,714	0.01	0.87	0.02	0.01	0.08	--	--	--	--	0.01
5	20,159	0.01	0.83	0.00	0.03	0.11	--	--	--	--	0.01
6	24,705	0.02	0.75	0.00	0.04	0.18	--	--	--	--	0.01
7	30,428	0.04	0.66	0.01	0.05	0.23	--	--	--	--	0.02
8	38,656	0.06	0.57	0.00	0.06	0.29	--	--	--	--	0.03
9	53,603	0.10	0.45	0.00	0.08	0.33	--	--	--	--	0.04
10	120,681	0.21	0.24	0.00	0.17	0.31	--	--	--	--	0.06
Overall	34,303	0.05	0.69	0.02	0.05	0.17	--	--	--	--	0.02
N (Aged Units)				7,008							

Panel B: Admin income shares

						Retirement Income					
Admin Aged Unit Income Decile	**Mean Admin Income**	**Earnings**	**Social Security**	**SSI**	**Interest and Dividends**	Total	D.B.	IRA	Non-IRA D.C.	Unknown	**Other Income**
1	7,471	0.00	0.57	0.30	0.05	0.07	0.06	0.01	0.00	0.00	0.01
2	12,395	0.01	0.81	0.09	0.02	0.06	0.05	0.01	0.00	0.00	0.01
3	16,883	0.01	0.84	0.02	0.02	0.11	0.09	0.01	0.00	0.00	0.01
4	21,604	0.02	0.72	0.00	0.04	0.21	0.17	0.03	0.00	0.01	0.01
5	26,948	0.03	0.63	0.00	0.05	0.28	0.22	0.04	0.00	0.01	0.01
6	33,543	0.03	0.54	0.00	0.06	0.35	0.26	0.07	0.00	0.01	0.02
7	42,494	0.04	0.47	0.00	0.07	0.40	0.32	0.06	0.01	0.01	0.02
8	53,992	0.06	0.40	0.00	0.09	0.42	0.32	0.09	0.01	0.01	0.03
9	72,852	0.07	0.32	0.00	0.12	0.47	0.33	0.12	0.01	0.01	0.03
10	158,996	0.12	0.19	0.00	0.20	0.45	0.27	0.15	0.01	0.02	0.04
Overall	45,232	0.04	0.55	0.04	0.07	0.28	0.21	0.06	0.01	0.01	0.02
Weighted Count (Aged Units)				15,102,003							
N (Aged Units)				7,095							

Source : CPS ASEC linked to SSA and IRS administrative records.
Notes : See Table 9.