An Evaluation of Retirement Income in the CPS ASEC Using Form 1099-R Microdata[*]

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ABSTRACT

In the past several decades, individuals 65 and over have experienced remarkable declines in poverty, from 35.2 percent in 1959 to 9.0 percent in 2011. These declines in official poverty rates, however, are based on self-reported income data from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC). In this paper I evaluate the quality of the retirement income data in the 2010 CPS ASEC by matching it to individual microdata from IRS 1099-R forms filed with tax returns in the tax year 2009. Taking 1099-R values as "truth," I find that the CPS ASEC measures retirement income well.

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INTRODUCTION

In the past several decades, individuals 65 and over have experienced remarkable declines in poverty, from 35.2 percent in 1959 to 9.7 percent in 2008 (Meyer and Sullivan, 2010). These declines in official poverty statistics, however, are based largely on self-reported income data from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC).

Some analysts have expressed concern that the retirement income items on the CPS ASEC are designed to capture payments from defined benefit retirement plans, such as pensions. Such payments are legitimately counted as income under almost any definition of the income concept. During the late 1980s and 1990s, however, retirement income shifted toward defined contribution plans and tax-advantaged savings accounts like Individual Retirement Accounts (IRAs). These payments are a combination of dissaving, asset income, and realized capital gains. The CPS ASEC still counts them as income, though contributions to such plans are also counted at the time those wages are earned. This double-counting could potentially overstate retiree income, overstate per capita income in areas with high concentrations of retirees (e.g. Florida, Arizona), and downwardly bias poverty rates for the elderly.

In this paper I evaluate the quality of the retirement income data in the 2010 CPS ASEC by matching it to individual microdata from IRS 1099-R forms filed with tax returns in the tax year 2009. Taking the Form 1099-R values as "truth," I find that the CPS ASEC measures retirement income well.

DATA

The Current Population Survey

The Current Population Survey (CPS) is a survey of households collected monthly by the Census Bureau, sponsored by the Bureau of Labor Statistics. The CPS provides data on basic labor market outcomes such as the monthly unemployment rate. Each year in months February through April, CPS respondents also complete the Annual Social and Economic Supplement (CPS ASEC) which asks detailed questions about employment, income, and health insurance status in the previous year.[2]

[2] Data are subject to error arising from a variety of sources. For more information on sampling and non-sampling error, see www.census.gov/apsd/techdoc/cps/cpsmar11.pdf. For the purposes of the analyses in this paper, however, the relevant universe is not the U.S. civilian non-institutionalized population at large, but rather the respondents of the CPS ASEC. Values reported herein are thus not "estimates" in the usual sense of sample survey data, but rather population counts.

In its income section, the CPS ASEC asks about the sources and amounts of retirement income received by household members during the previous calendar year.[3] The questions are as follows:

Did [*name of household member*] receive any pension or retirement income?

0 = not in universe
1 = yes
2 = no

[This repeats for four different income sources. The first two sources can have income up to $3,000,000 each, and the second two sources can have up to $100,000.]

What was the source of income?

0 = none or not in universe
1 = company or union pension
2 = federal government retirement
3 = US military retirement
4 = state or local government retirement
5 = US railroad retirement
6 = regular payments from annuities or paid insurance policies
7 = regular payments from Keogh or 401(k) accounts
8 = other sources including IRA or Keogh or don't know

How much did [*name of household member*] receive from [*source type*] during 2009?

0 = not in universe
1-3,000,000 = retirement income, first source

Like most of the questions collected in the CPS ASEC, the income data are subject to post-collection editing and imputation. Editing replaces contradictory values with valid values. Imputation fills in each missing value with a valid value taken from another respondent who matches on various demographic characteristics. The table below lists the specific variables used in imputing retirement income by hot-deck procedure. If a valid value is not located from a donor that matches on the Level 1 variables, then the algorithm attempts to find a donor that matches on the less restrictive Level 2 variables.

[3] The instrument also asks about widow or survivor income (including company or union survivor pensions, US military retirement survivor pensions, other types of survivor pensions, and regular payments from estates, trusts, annuities, or life insurance. It is unclear whether these types of income require the filing of Form 1099-R, so I do not include widow or survivor income. I also do not include disability income, for the same reason. Future research using these files may include analysis of these variables.

Match variables for imputing RET_VAL(1)

Variable	Level 1	Level 2
1. Rental income source	RETSC1	RETSC1
2. Age	AGE2	AGE2
3. Sex	SEX1	SEX1
4. Race	RACE1	RACE1
5. Education	ED2	ED2
6. Social security recipiency	SS1	
7. Interest/dividend recipiency	ID1	
8. Worker status	WS1	

The IRS Form 1099-R file

The Form 1099-R is an information return prepared by payers (e.g., financial institutions) of pensions, annuities, retirement or profit-sharing plans, IRA distributions or conversions, distributions from certain types of insurance contracts, or a few other related transactions. The 1099-R covers a broader set of payment types than the CPS ASEC retirement items, which may explain some of the apparent underreporting documented below. The payer sends a copy to the taxpayer/recipient and another copy to the IRS. The form is only required when the proceeds of payments are more than $10.

The 2009 Form 1099-R file is an extract from the Information Returns Master File. It is provided to the Census Bureau by the IRS and contains almost 70 million records. Each record represents one form filed by a payer on behalf of a potential taxpayer regarding income paid during 2009. Use of the file is restricted to only a few specific statistical purposes, and each individual project must be approved on a case-by-case basis. The file (after processing to remove personally identifiable information, as described below) includes the following fields: the Protected Identification Key (PIK, described below), the gross distribution amount in Box 1 of the form, and the distribution type, which is collapsed into two values: 1. payments from IRAs, and 2. payments from pensions, annuities, and other employer-sponsored plans.[4] In this paper I only analyze the gross distributions, summed by PIK and matched by PIK to the CPS ASEC.

METHODS

Each observation in the CPS ASEC is assigned a sample weight according to the number of people that person represents in the U.S. civilian non-institutional population. Since this study is not concerned with estimating parameters of the U.S. population at large, however, and instead focuses on describing the properties of the CPS ASEC microdata, I do not use these sample weights. All results below are based on unweighted data.

[4] Payments that do not fit into either of these categories are excluded from the extract file provided to the Census Bureau.

In order to match the CPS ASEC to the Form 1099-R file, both files must first undergo Person Identification Validation System (PVS) processing, which is undertaken by the Center for Administrative Records Research and Applications (CARRA) at the U.S. Census Bureau. CARRA specializes in data integration and record linkage. The PVS process is quite complicated, and a full treatment of it is beyond the scope of this paper.[5] In general, PVS can be thought of as a probabilistic matching process that assigns a Social Security Number to each person based on name, address, date of birth, and gender. The PVS then encrypts the Social Security Number, thereby generating anonymous person identifiers called Protected Identification Keys (PIKs). Since each person is (ideally) assigned a unique PIK, the PIK can be used to match people across different surveys, public and private administrative records, and other person-level data sources.

For the purposes of this study, a few unique features of the PVS are relevant. First, since the PVS is necessarily a probabilistic match, it introduces non-sampling error to estimates. NORC's (2011) analysis of ACS 2009 unmatched records finds that unmatched records differ from matched records on many dimensions, including reported income and employment. This suggests that the PVS process will bias income estimates. Even if the relevant characteristics of the matching records equaled the unmatched records, the PVS necessarily introduces noise which should increase the variance of estimates. Appropriate methods of accounting for this increased variance remain an open research question. Below I further discuss the specific implications of PVS matching error in relation to certain results.

Some respondents have multiple matching Form 1099-R records. One reason for this is that a person will receive a Form 1099-R for each source of income, so a person can have multiple Forms 1099-R in a tax year. I sum the amounts from each person's matching forms.

Table 1 summarizes the results of the PVS matching process. More than 99 percent of all records in the tax year 2009 Form 1099-R file are successfully assigned a PIK, while 88 percent of records in the CPS ASEC are successfully matched to a PIK. The resulting 184,883 records in the CPS form the analysis sample, among which 23,555 records are matched to at least one Form 1099-R.

RESULTS

Comparison of unconditional distributions of recipiency and amounts received

Comparisons between ASEC and the 1099-R microdata are contained in Tables 2, 3, and 4. Table 2 is a cross-tabulation of unweighted counts at the national level, split by 1099-R availability (i.e., whether a 1099-R record is matched) and receipt of retirement income as reported in the CPS ASEC. The first column of Table 2 shows that virtually none of the CPS

[5] For details, see NORC (2011): http://www.norc.org/PDFs/May%202011%20Personal%20Validation%20and%20Entity%20Resolution%20Conference/PVS%20Assessment%20Report%20FINAL%20JULY%202011.pdf

ASEC respondents that are out-of-universe for the retirement income items have any matching 1099-R records. This suggests both that the Census Bureau has correctly defined the universe for retirement income and that there are relatively few “false matches”.

The second and third columns of Table 2 can be interpreted to show both that the CPS ASEC measures recipiency well, and that the PVS matching process worked well. Nearly 91 percent of CPS ASEC respondents who report receiving retirement income are matched to a Form 1099-R record. 88 percent of repondents who claim they did not receive retirement income also do not have a matching 1099-R. Overall, 89 percent of respondents report recipiency “correctly.” A note of caution is warranted regarding the results shown in Table 2. The PVS processing will tend to assign PIKs to CPS ASEC respondents who correctly report personally identifying data like name and date of birth. It seems likely that there is a positive correlation between a respondent providing reliable personal data and also correctly reporting their retirement income recipiency; if so, the results in Table 2 overstate the quality of the CPS ASEC recipiency data.

An alternative interpretation of Table 2 is as follows. Two-thirds of respondents with a matched 1099-R are listed in the CPS ASEC as not receiving retirement income. While 13 percent of CPS ASEC respondents have matched 1099-R, only 5 percent are reported as receiving retirement income. These suggest that recipiency is actually not measured well. The 1099-R is required for more types of income than are covered by the ASEC concept, which may explain a portion of the discrepancy, and it is difficult to judge the extent to which mismatching may play a role. Yet, taking the existence of a matched 1099-R as “truth,” one can still reconcile these seemingly opposite conclusions in that the CPS ASEC has few false positives but potentially substantial false negatives.

Tables 3 and 4 are cross-tabulations of unweighted counts at the national level, split by the “true” 1099-R amount and the difference between the amount reported on the CPS ASEC and the 1099-R amount. The sample definition is the only dimension that changes across these four tables. Cells with fewer than five cases are suppressed to protect respondent confidentiality.

Table 3 uses the full sample of all 184,883 CPS ASEC cases that are successfully matched to a PIK. The first column represents respondents who are not matched to any Form 1099-R. Although there are 196 respondents in this group who reported receiving income of four or five figures (and thus unlikely to be truly misreporting), this is a small number when compared to the more than 160,000 in this group who did not report that they received any retirement income. This reflects the quality of recipiency reporting and the PVS match as documented in the top row of Table 2.

The other columns of Table 3 show the discrepancies for respondents who are successfully matched to at least one Form 1099-R. Most of these respondents have 1099-R income of four or five digits (85 percent). In each column, a large majority of cases are off by a negative amount of the same magnitude as the 1099-R amount. Comparison of Table 3 to Table 4, which only

includes cases with positive amounts of reported CPS ASEC retirement income, reveals that nearly all of these are due to respondents who report no income although they are matched to a Form 1099-R. The first value in each column of Table 4, as opposed to Table 3, reflects the exclusion of people who did not report retirement income in the CPS ASEC.

People receiving at least $1,000 (94 percent of people who report a positive amount) sometimes substantially underreport the amounts they receive. Among those receiving income of four figures, 27 percent underreport by a four-figure amount. Also, among five-figure recipients, 27 percent underreport by five figures. Of those reporting a positive amount, only 1 percent receive an amount in six figures, but 35 percent of those underreport by at least $100,000.

Still, these underreporters are a minority of the sample, and the correlation between reported income and actual income remains strong. Among the 5,880 cases with a matching 1099-R and reporting a positive amount on the CPS ASEC, the correlation coefficient between the log reported amount and the log actual amount is 0.769. The R^2 of a regression of log reported amounts on log actual amounts is the square of the correlation coefficient, 0.591. The mean (signed) difference is -$3,983, however, suggesting that underreporting among those receiving large amounts could lead to large differences in means or aggregates.[6]

Disclosure avoidance precludes a scatterplot of the amounts reported in ASEC against amounts in 1099-R, but such a scatterplot can be qualitatively described as showing a strong linear relationship between the two amounts, along the 45-degree line of equality. Some horizontal streaks appear in the plot, indicating heaping of amounts in the survey data, which is absent from the administrative 1099-R data.

While I also analyzed variation in discrepancies with respect to whether values are imputed or not, the samples were too small to allow for tabulation.

[6] The correlation coefficient, the R^2, and the mean signed difference are all statistically significantly different from zero at the 90 percent confidence level. The mean signed difference is the mean difference between the reported amount and the actual amount, averaged across all respondents with a matching 1099-R and reporting a positive amount on the CPS ASEC.

Comparison of the age distributions of recipiency

Results of comparisons of age distributions of the recipiency of retirement income are illustrated in Figures 1, 2, and 3.

Figure 1 plots proportion receiving retirement income by age. Three series are plotted: ASEC unedited values, ASEC edited values, and 1099-R values. Each series is weighted using ASEC final sample weights. However, this weighting is not intended to estimate national-level parameters, and is done only to describe the weighted sample. Some age cells are collapsed, such that every non-empty cell has at least approximately 10 observations (and never less than 6 observations).

Figure 1 shows that the three data sources all agree that individuals through their early twenties have no retirement income. This is partly by construction in the ASEC, as the universe for retirement income consists of those age 15 and up. Among people aged roughly 25 to 50, Figure 2 shows that 1099-R records indicate that about 10 percent of people of this age group receive retirement income, even though both ASEC sources are at or near zero. The three sources begin to diverge further for the elderly, with the edited ASEC apparently underreporting recipiency by about half.

Figure 2 is a transformation of the previous Figure 1, as Figure 2 illustrates the difference between recipiency rates in the 1099-R and recipiency rates in the edited ASEC, across all ages. This figure shows three age ranges of sharp divergence: in one's 20s, one's early 60s, and possibly in one's early 70s, though increased variation in the later years makes the last of these transitions less clear.

Some of these transitions may be due to age cutoffs in the regulations governing individual retirement accounts (IRAs) and 401(k)s. At age 55 the early withdrawal penalty for 401(k)s ends. at age 59½ the early withdrawal penalty on IRAs ends, and at age 70½ account holders are required to begin taking distributions from any 401(k)s and IRAs.

Table 5 shows results from a linear probability regression model for 1099-R retirement recipiency with a quintic control for age and discontinuities at the relevant cutoffs. Table 6 shows the results from the corresponding tests of differences between the coefficients in Table 5. These tests in Table 6 show a relatively large and statistically significant discontinuity at age 59½, of 14.0 percentage points. This is the age at which withdrawals from IRAs are allowed without penalty, which suggests that such IRA withdrawals may represent an important source for measurement error in the CPS ASEC. Some previous literature, however, has indicated that IRA withdrawals are often taken as lump-sum distributions, which would fall outside the scope of the ASEC income definition.

Figure 3 plots fitted values from the previous regression model, with reference lines at the specified ages. This figure illustrates that the relatively large jump in 1099-R recipiency at age

59½, of 14.0 percentage points, represents an increase in the conditional expectation from 19.2 percent at age 59 to 35.7 percent at age 60. This is a proportional increase in the probability of receiving retirement income of 79.5 percent.

CONCLUSION

In this paper I evaluate the quality of the retirement income data in the 2010 CPS ASEC by matching it to individual microdata from 1099-R forms filed with tax returns in the tax year 2009. The main outcome is that the CPS ASEC measures retirement income recipiency and amounts better than might have been expected, although underreporting among the highest recipients may lead to large differences in means or aggregates, and there may be a large number of false negatives.

I also analyze the differences in the joint distribution of age and retirement income recipiency. I find that, while 1099-R microdata confirms the ASEC for the young, the two sources diverge somewhat for individuals aged approximately 25 to 50, leading to a sharp additional divergence at age 59½, which is the age at which IRA withdrawals are allowed without penalty. Although this seems to provide suggestive evidence that IRA withdrawals may be an important source of unmeasured income, previous literature has suggested that many IRA withdrawals are taken as lump-sum distribution rather than as a regular, ongoing payment. Such lump-sum payments are excluded from the CPS ASEC income definition, and thus represent a difference in the respective scopes of the two data sources rather than measurement error *per se*.

This paper should be considered a description of an ongoing research project rather than a final report. Several avenues for future research immediately recommend themselves. First, the extent and nature of the misreporting has not yet been fully explored. An analysis that identifies which demographic characteristics are most predictive of misreporting would be helpful. The age distribution analysis in this paper is a first step in this direction. Disaggregating retirement income by its constituent sources (e.g., pensions vs. IRAs) may shed light on the contention that the shift in recent years to defined contribution plans has diminished the accuracy of the CPS ASEC.

Second, the opportunities for methodological improvement can be more fully explored in the near future. For example, the 1099-R data may be useful for generating more accurate imputed values. An assessment of this possibility is well within the scope of this project.

Third, the findings of this project will have several implications for the measurement of poverty, income inequality, and the well-being of the elderly, which will need to be more explicitly characterized. For example, it would be useful to know whether misreporting increases the measured official poverty rate or decrease it, in an analysis similar to that of Hokayem, Ziliak, and Bollinger (2012), who gauge the impact of wage misreporting and imputation on poverty rates. Such calculations are important goals of the research agenda initiated with this paper.

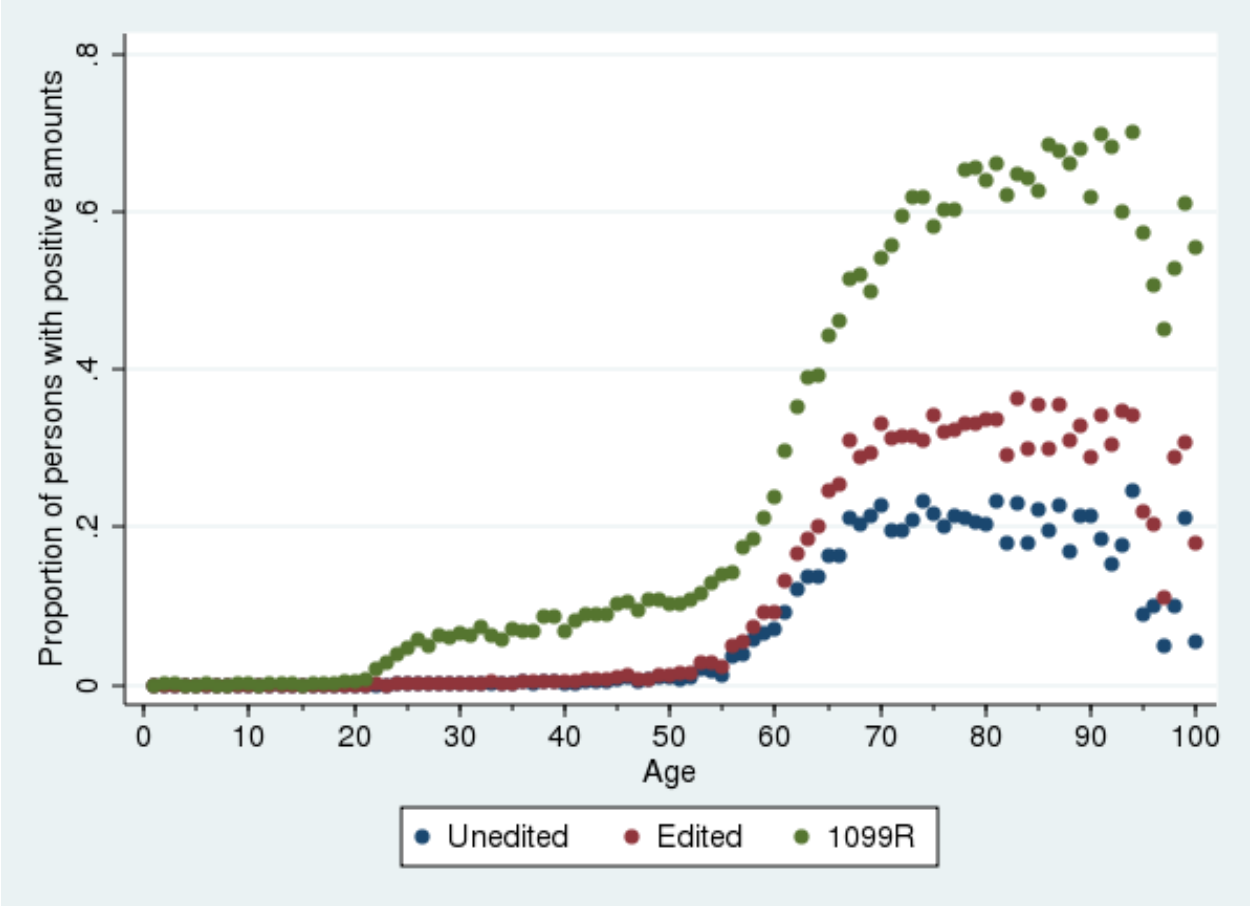
REFERENCES

Hokayem, Charles, James Ziliak, and Chris Bollinger (2012) CPS Non-Response and the Measurement of Poverty. Working paper, presented at the 2012 Joint Statistical Meetings.

Meyer, Bruce D., and James X. Sullivan. (2010) Consumption and Income of the Poor Elderly Since 1960. Working paper.

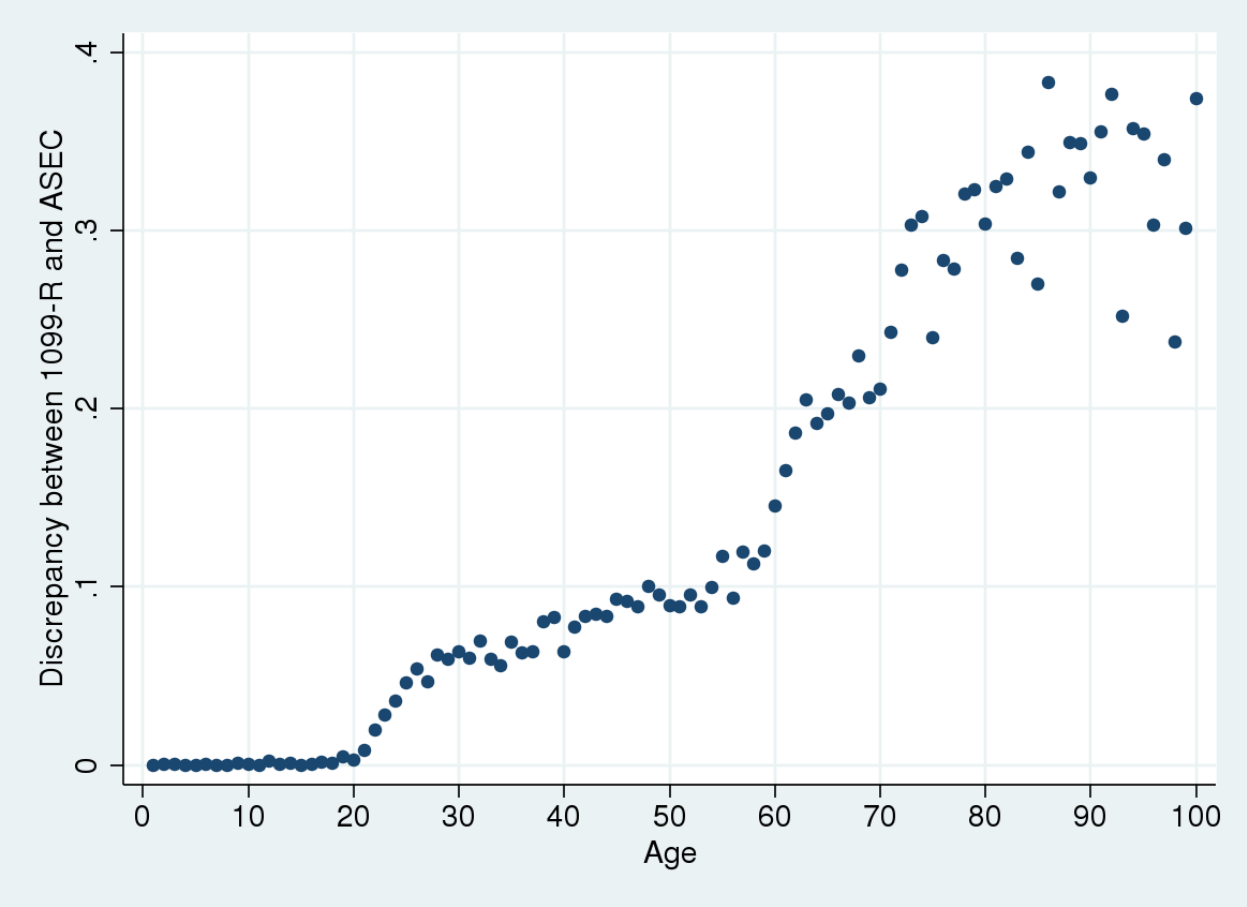
NORC at the University of Chicago. (2011) Assessment of the U.S. Census Bureau's Person Identification Validation System. Final report presented to U.S. Census Bureau, March 31.

Figure 1: Comparison of age distributions across unedited ASEC, edited ASEC, and 1099-R microdata



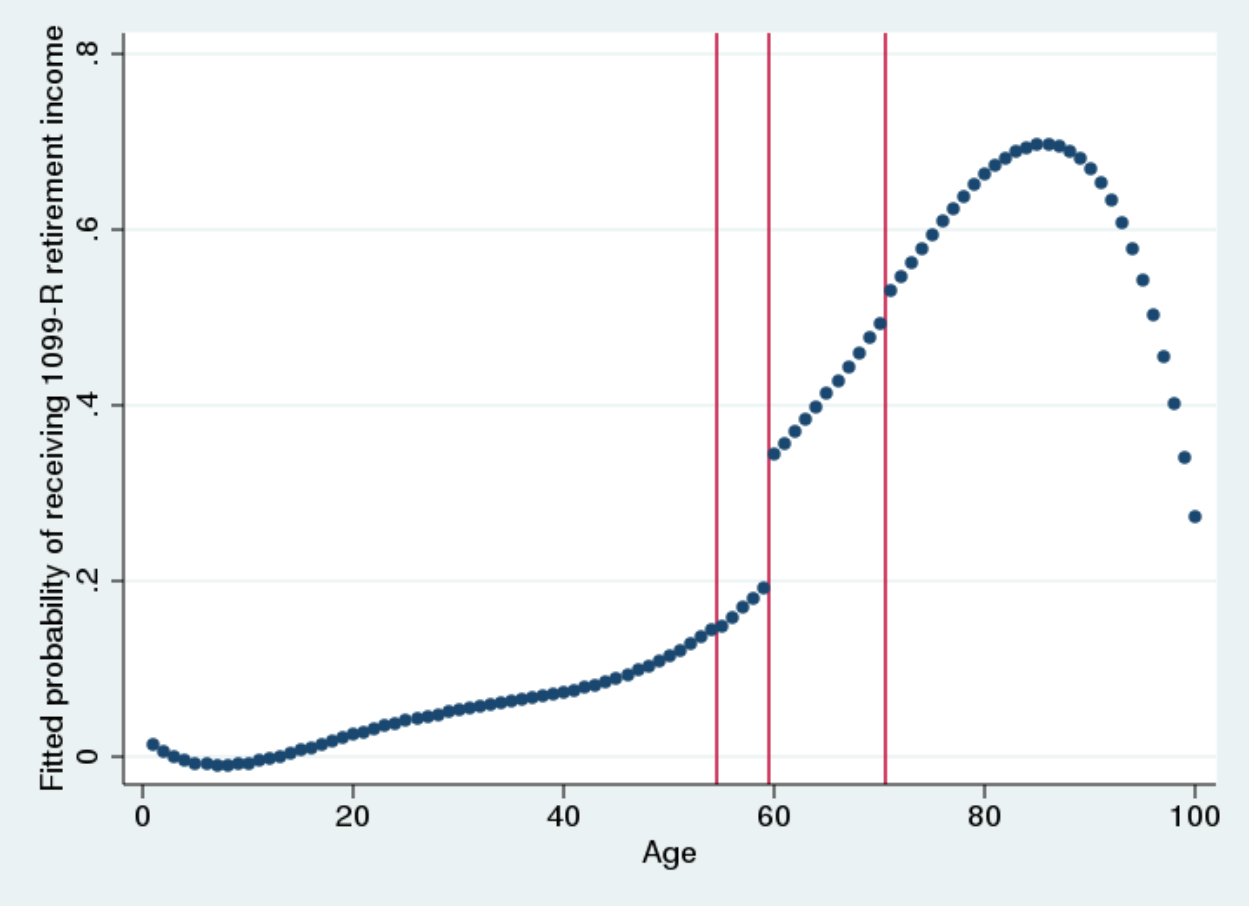
Sources: 2010 Current Population Survey Annual Social and Economic Supplement, IRS Tax Year 2009 Form 1099-R microdata.

Figure 2: Differences in recipiency rates between edited ASEC and 1099-R microdata



Sources: 2010 Current Population Survey Annual Social and Economic Supplement, IRS Tax Year 2009 Form 1099-R microdata.

Figure 3: Fitted values from a linear probability model with a quintic control for age and discontinuities at specific age cutoffs



Sources: 2010 Current Population Survey Annual Social and Economic Supplement, IRS Tax Year 2009 Form 1099-R microdata.

Table 1: Sample sizes at each stage of the matching process

Total number of person-form records in TY2009 1099-R files	69,509,404
Unprocessed due to blank name	339,312
Records submitted to PVS search	69,170,092
Records found in PVS searches	68,887,198
Percent found, of those submitted to search	99.59%
Percent found, of all records in TY2009 1099-R file	99.10%
Number of people (unique PIK values)	44,868,790
Total person records in 2010 CPS ASEC crosswalk file	211,384
Unprocessed due to respondent opt-out	1,002
Unprocessed due to blank name	2,642
Records submitted to PVS search	207,740
Records found in PVS searches	186,300
Percent found, of those submitted to search	89.68%
Percent found, of all records in 2010 CPS ASEC file	88.13%
Records found in PVS that also have non-missing household sequence numbers	**184,883**
Number of validated 1099-R records matched to validated 2010 CPS records	**23,555**

Source: Internal documentation from Census Bureau Center for Administrative Records Research and Applications, "TY2009 PVS MAF Match Results – IRS1099R"

Table 2: Unweighted cross-tabulation of 1099-R availability and receipt of retirement income

	Reported receiving retirement income (RET_YN)			
	Not in universe	Yes	No	Total
Does not have matched 1099-R	42,740	840	117,748	161,328
	99.96%	9.42%	88.39%	87.26%
Has matched 1099-R	16	8,073	15,466	23,555
	0.04%	90.58%	11.61%	12.74%
	42,756	8,913	133,214	184,883

Sources: 2010 Current Population Survey Annual Social and Economic Supplement, IRS Tax Year 2009 Form 1099-R microdata.

Table 3: Differences between ASEC reported amount and 1099-R amount

Discrepancy	Amount of Actual Retirement Income (Recorded on Form 1099-R)						
(*Reported on ASEC - Actual*)	$0	$1 to $99	$100 to $999	$1,000 to $9,999	$10,000 to $99,999	$100,000 or more	Total
-$100,000 or less	-	-	-	-	-	272	272
-$99,999 to -$10,000	-	-	-	-	8,057	34	8,091
-$9,999 to -$1,000	-	-	-	7,825	1,605	5	9,435
-$999 to -$100	-	-	2,340	376	396	< 5	3,113
-$99 to -$10	-	642	17	173	74	0	906
-$9 to $9 excluding exact matches	< 5	86	47	255	75	0	466
$10 to $99	< 5	0	17	54	36	< 5	110
$100 to $999	12	< 5	10	109	151	< 5	284
$1,000 to $9,999	93	< 5	17	124	282	< 5	520
$10,000 to $99,999	103	< 5	13	54	88	< 5	260
$100,000 or more	< 5	0	0	< 5	28	< 5	38
Exact match ($0)	161,111	< 5	27	109	137	< 5	161,388
Total	161,328	733	2,488	9,082	10,929	323	184,883

Sources: 2010 Current Population Survey Annual Social and Economic Supplement, IRS Tax Year 2009 Form 1099-R microdata.

Table 4: Differences among respondents reporting a positive amount of retirement income

(*Reported on ASEC - Actual*)	Amount of Actual Retirement Income (Recorded on Form 1099-R)						
	$0	$1 to $99	$100 to $999	$1,000 to $9,999	$10,000 to $99,999	$100,000 or more	Total
-$100,000 or less	-	-	-	-	-	27	27
-$99,999 to -$10,000	-	-	-	-	1,049	34	1,083
-$9,999 to -$1,000	-	-	-	456	1,605	5	2,066
-$999 to -$100	-	-	13	376	396	< 5	786
-$99 to -$10	-	0	17	173	74	0	264
-$9 to $9 excluding exact matches	< 5	< 5	47	255	75	0	382
$10 to $99	< 5	0	17	54	36	< 5	110
$100 to $999	12	< 5	10	109	151	< 5	284
$1,000 to $9,999	93	< 5	17	124	282	< 5	520
$10,000 to $99,999	103	< 5	13	54	88	< 5	260
$100,000 or more	< 5	0	0	< 5	28	< 5	38
Exact match ($0)	-	< 5	27	109	137	< 5	277
Total	217	7	161	1,713	3,921	78	6,097

Sources: 2010 Current Population Survey Annual Social and Economic Supplement, IRS Tax Year 2009 Form 1099-R microdata.

Table 5: Linear probability model for 1099-R match, with discontinuities at specific age cutoffs

Number of observations	=	184883
R-squared	=	0.2939
Root MSE	=	0.2993

Dependent variable: Indicator for whether person has a matching 1099-R

Independent variable	**Coefficient**	**Robust std. err.**	**t-stat**	**P > |t|**
Age 55 to 59	-0.005	0.006	-0.78	0.438
Age 60 to 70	0.136	0.010	13.90	0.000
Age over 70	0.156	0.020	7.86	0.000

Note: The regression specification includes a constant and a 5th-order polynomial control for age. The omitted reference group consists of those age under 55. The regression is weighted using final sample weights, but it does not employ replicate weights in the calculation of standard errors.

Sources: 2010 Current Population Survey Annual Social and Economic Supplement, IRS Tax Year 2009 Form 1099-R microdata.

Table 6: Tests of the discontinuities estimated in the linear probability model for 1099-R match

Age cutoff	**Change in recipiency rate at cutoff**	**Robust std. err.**	**t-stat**	**P > |t|**
Age 55	-0.005	0.006	-0.78	0.438
Age 59 ½	0.140	0.008	17.66	0.000
Age 70	0.020	0.132	1.56	0.120

Note: Results represent tests of differences between regression coefficients displayed in Table 5 above. The regression specification includes a constant and a 5th-order polynomial control for age. The omitted reference group consists of those age under 55. The regression is weighted using final sample weights, but it does not employ replicate weights in the calculation of standard errors.

Sources: 2010 Current Population Survey Annual Social and Economic Supplement, IRS Tax Year 2009 Form 1099-R microdata.