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The Hidden Resources of Women Working Longer Evidence from Linked Survey-Administrative Data

C. Adam Bee and Joshua Mitchell

9.1 Introduction

We begin with a puzzle. Why has the dramatic rise in female life cycle labor force participation not been accompanied by an increase in retirement income for women at older ages?

The basis for this puzzle is the Current Population Survey Annual Social and Economic Supplement (CPS-ASEC), the source of the nation's official income and poverty statistics. We use it to plot in figure 9.1 the rate of retirement income receipt for women age sixty-five to sixty-nine and age seventy to seventy-four between 1987 and 2012.¹ As we will discuss in more detail, our measure of retirement income also includes survivor and disability income but excludes all payments from Social Security and veterans benefits. (The sample in figure 9.1 is further restricted to women who also report receiving Social Security income to focus attention on women who are very likely to be retired.) For both women age sixty-five to sixty-nine and age

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1. For survey years prior to the 1988, our CPS-ASEC files do not allow us to define retirement income in a way that is fully consistent with the 1987 to 2012 reference-year period. In 2014, the CPS-ASEC underwent a major redesign that altered the questions relating to retirement income. See Semega and Welniak (2015) and Mitchell and Renwick (2015) for more details.

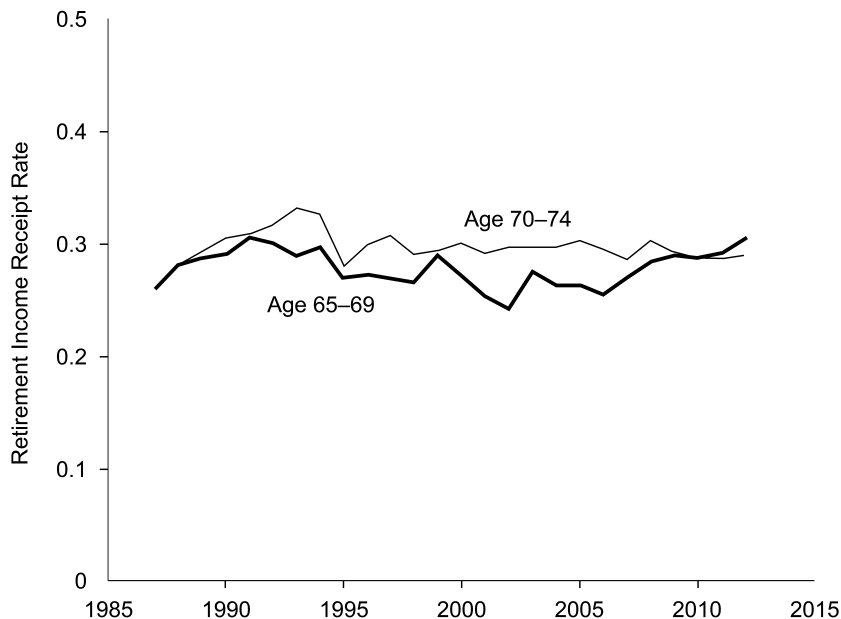


Fig. 9.1 Trends in retirement income receipt for women who report receiving Social Security

Source: The 1988–2013 CPS-ASEC surveys.

Notes: Sample is all women ages sixty-five to sixty-nine and seventy to seventy-four who report receiving Social Security income in the reference year. “Retirement income receipt” is the fraction of women with positive retirement, survivor, or disability income in the reference year, excluding Social Security income and VA benefits.

seventy to seventy-four, it is remarkable how little retirement income receipt has apparently changed in twenty-five years. The rate of receipt fluctuates within a band of about 7 percentage points, and it never exceeds 34 percent.

The lack of any measurable trend comes in spite of many changes during working years that one might think would alter the trajectory of retirement income, particularly for women. More recent cohorts of women are attached to the labor force for longer periods of time (Goldin and Mitchell, *forthcoming*), are more likely to have careers rather than just jobs (Goldin 2006), are more likely to graduate from college (Goldin, Katz, and Kuziemko 2006), and are paid at higher rates relative to men (DeNavas-Walt and Proctor 2015). So why would they not be more likely to have a pension, a 401(k), or an individual retirement account (IRA)?

We use linked survey-administrative data to argue that surveys such as the CPS-ASEC are increasingly failing to capture much of the retirement income received by women, and this omission has significant implications for understanding their material well-being in retirement. We do not mean to suggest that underreporting is unique to women. In related work (Bee and

Mitchell, in progress), we provide an in-depth analysis of underreporting and its causes. That work shows that underreporting is also prevalent among men and therefore has consequences for measuring the incomes of the entire population age sixty-five and over. In fact, retirement income underreporting results in a substantial understatement of median household income and an overstatement of the official poverty rate among the aged. However, in keeping with the theme of this volume, we choose to focus exclusively on women born from the early 1920s to the late 1940s and draw out implications of their increasing labor force attachment across successive birth cohorts.

Our main contribution is to highlight that to the extent underreporting is a growing problem, household surveys will fail to reflect the full consequences of women working longer and understate the economic progress of women at older ages. We show that underreporting not only biases trends in income across cohorts, but also distorts the relationship between career work experience and retirement income within a given cohort. Last, we show that for recently retired women, accurate measures of retirement income are crucial for understanding the transition to retirement. In contrast to previous work, we find very little evidence of total household income falling for most women as they and their spouses (if present) withdraw from the labor market and begin to receive Social Security.² Our finding poses a challenge to the literature on the “retirement consumption puzzle,” which seeks to explain household consumption behavior under the assumption that incomes are falling predictably at retirement.

We should note that concerns about measuring retirement income in the CPS-ASEC are not new (Czajka and Denmead 2012). Conceptually, the CPS-ASEC aims to capture money income, or a stream of regular payments. This accounting fits naturally with traditional defined-benefit pension plans, which typically provide annuity income, but it is more challenging to reconcile with defined-contribution (DC) retirement plans, where withdrawals are often done on an as-needed basis. Partly in response to the changing retirement landscape, the CPS-ASEC underwent a major redesign in 2014. That design change was intended to provide more accurate information on income from defined-contribution plans (Mitchell and Renwick 2015; Semega and Welniak 2015). For our purposes we will consider both annuities and retirement account withdrawals as income, but note that many of the cohorts of women examined in this chapter are likely to have only defined-benefit income.

We begin in section 9.2 by briefly reviewing the relevant literature. We next describe the construction of our newly linked survey-administrative data set in section 9.3. In section 9.4, we document trends in work, Social Security, and retirement income for successive cohorts of women born

2. Using panel tax data, Brady et al. (in progress) also find little evidence of an income drop at retirement.

between the early 1920s and the late 1940s. In section 9.5, we compare CPS self-reports with administrative records to demonstrate growing retirement income underreporting rates across birth cohorts and the consequences for measuring women's total incomes. In section 9.6, we explore the relationship between years of work experience and bias in retirement income measurement for women born in the late 1940s. In section 9.7, we examine incomes for women and their spouses (if present) as they transition to retirement. Section 9.8 concludes.

9.2 Prior Work

The literature on measuring income and well-being in surveys is vast and we do not attempt an exhaustive review here. Studies most related to our chapter reassess the well-being of the aged in retirement. Cutler and Katz (1991), Hurd and Rohwedder (2006), and Meyer and Sullivan (2010, 2012) compare consumption- and income-based measures of poverty and find evidence of considerably more economic progress for the aged when using consumption measures. The life cycle model motivates a focus on consumption because consumption is more closely connected to long-run economic status. Consumption may also be preferable if certain types of income are difficult for survey respondents to report. We contribute to the above studies by uncovering substantial underreporting of retirement income for women using administrative records. Our findings thereby help reconcile the differences found between survey-based measures of consumption and income for the aged.

Beyond measuring income and consumption at points in time, our findings also relate to longitudinal studies that examine changes in well-being over time, especially as households transition into retirement. A number of prominent studies such as Banks, Blundell, and Tanner (1998) and Bernheim, Skinner, and Weinberg (2001) have noted that consumption appears to fall sharply at retirement. Because the standard life cycle model predicts that forward-looking households should be able to smooth consumption in response to anticipated declines in income, this apparent empirical violation gives rise to the "retirement consumption puzzle" and is taken as evidence that households are myopic and inadequately prepared for retirement. More recent studies have questioned this initial conclusion.

Hurst (2008) surveys the recent literature and finds that it is mainly work and food expenditures that decline, while recreational spending and donations to charity actually increase. Moreover, the decline in food expenditures is offset by an increase in home production and an increase in shopping for grocery bargains such that actual food consumption does not fall (Aguiar and Hurst 2005, 2007). Although we do not measure consumption directly, our findings challenge the premise that income falls for most households in retirement. Our administrative record measure of retirement income plays

an important role in obtaining this result. Even though the composition of consumption may change at retirement, we show that it is not possible to test the life cycle model against alternatives when annual incomes remain steady, at least for a cohort of recently retired women.

Last, our use of administrative records to validate survey responses contributes to the large literature on survey measurement error. With the exception of our work in Bee (2013) and Bee and Mitchell (in progress), few studies have been able to validate retirement income directly. Studies reviewed in Munnell and Chen (2014) compare survey aggregates to outside sources such as the National Income and Product Accounts or SOI tax tables (which exclude nonfilers) and conclude that the CPS-ASEC is missing substantial amounts of retirement income, usually with an emphasis on income from defined-contribution accounts. But without the ability to link survey and administrative data, the distributional implications of underreported retirement income remain strongly disputed. For the cohorts of women examined, we show that correcting for underreporting does, in fact, have broad distributional consequences.

Other studies do address survey measurement error with respect to pensions and retirement accounts but focus on current workers, comparing survey responses to employer-provided plan descriptions (Gustman, Steinmeier, and Tabatabai 2010; Mitchell 1988). These studies reveal that workers in general do not understand key features of pension plans such as early retirement options and the distinction between defined-benefit and defined-contribution systems. Workers also have trouble reporting participation in defined-contribution plans and the amount of their contributions (Dushi and Honig 2015; Dushi and Iams 2010). A lack of financial literacy may hinder the gathering of accurate information on retirement preparation (Lusardi and Mitchell [2014] and chapter 6, this volume). It may also provide clues as to why underreporting of incomes in retirement appears to be a significant problem.

9.3 Data and Methods

We construct a novel data set that links survey data with several administrative record sources. For most of our analysis, the underlying samples are drawn from the Survey of Income and Program Participation (SIPP). The SIPP is a series of nationally representative samples of households interviewed over a multiyear period. We use the first waves of the 1984, 1990, 1996, 2001, 2004, and 2008 SIPP panels. We use a harmonized version of the SIPP known as the Gold Standard File.³ Because we are only using a single wave from each panel, we are treating the SIPP data as a series of cross

3. Data from the SIPP Gold Standard File are confidential. All results have been formally reviewed to ensure that no confidential Census Bureau data have been disclosed.

sections, drawing mainly demographic and household-relationship information from the SIPP. The longitudinal dimension of our analysis comes exclusively from the administrative records with the advantage that we can follow our SIPP samples forward and backward in time without attrition.

We do not use income data directly from the SIPP because SIPP income data are collected for a four-month reference period that does not correspond to calendar-year information available in several of our administrative record sources. Instead, we compare annual income from the linked administrative records to standalone data from the CPS-ASEC.

As mentioned above, the CPS-ASEC is the source of the nation's official income and poverty statistics. Between February and April of each year, the CPS-ASEC surveys a nationally representative sample of approximately 75,000 households and ascertains income types and annual amounts for the previous calendar year. We are particularly interested in the extent to which retirement income is underreported in the CPS-ASEC and how that may bias our assessment of women's well-being at older ages. The CPS-ASEC asks the following question for each member of the household related to retirement income:

Other than Social Security or VA benefits, did . . . receive any pension or retirement income?

If the response is affirmative, then follow-up questions elicit the amount and source of income. There are two analogous sets of questions about survivor income and disability income outside of Social Security and VA benefits. We aggregate responses to all three questions in our definition of retirement income.

We choose to use the linked SIPP data rather than the linked CPS-ASEC for most of our analysis because the linked SIPP data are available further back in time and allow us to examine earlier cohorts of women. Furthermore, the SIPP data tend to have higher linkage rates.⁴ But when we examine the most recent birth cohort of women in their older ages in section 9.6, we need to use the linked 2013 CPS-ASEC rather than the SIPP.

Our administrative records allow us to examine five types of income that are particularly important at older ages: earnings (both wages and self-employment), Social Security benefits, Supplemental Security Income (SSI), interest and dividends, and retirement income. Data on earnings, Social Security benefits, and SSI are obtained from the Social Security Administra-

4. The SIPP and CPS-ASEC data are assigned a Personal Identification Key (PIK), which is a confidentiality-protected version of a Social Security number. The PIK allows the survey data to be linked to the administrative records. (See Wagner and Layne [2014] for more details.) Linkage rates vary across each survey, but are generally in the high 80 percent range. In order to account for any differences between the PIK subsample and the overall sample, we run for each survey a logit model using demographic information to predict the assignment of a PIK and calculate an estimated propensity score. We then multiply the survey weight by the inverse of the estimated propensity score.

tion (SSA). Data on taxable and tax-exempt interest and dividends come from IRS Form 1040 records. Not everyone files a 1040 in a given year, but we can assume that those with more than minimal amounts of capital income would be required to file.

Last, retirement income data come from two sources and are available regardless of whether or not an individual filed a tax return in a given year. We have discovered data from Form W-2P “Statement for Recipients of Annuities, Pensions, Retired Pay, or IRA Payments,” in SSA administrative records for years 1978 to 1990. These records contain periodic payments and withdrawals but exclude rollovers and other total distributions that are best thought of as moving money from one retirement account to another. After 1990, Form W-2P was merged with IRS Form 1099-R, “Distributions From Pensions, Annuities, Retirement or Profit-Sharing Plans, IRAs, Insurance Contracts, etc.” We have obtained from IRS the 1099-R information returns from 1995 onward. Our version of the 1099-R extracts also excludes direct rollovers and other transactions we would not wish to consider as increasing the resources available to women in retirement. In short, we have reliable and reasonably consistent retirement income data spanning 1978 to 1990 and 1995 onward. These data allow us to examine long-run trends in underreporting of retirement income in the CPS-ASEC.

From each linked survey, we draw a five-year birth cohort group of women such that they are in their sixties when interviewed. Across all linked surveys, we cover women born from the early 1920s to the late 1940s. The women in our sample are either the householder or spouse of the householder. Last, for tracking incomes over time, we often require that women survive until age seventy to maintain a balanced panel. All income amounts are adjusted for inflation using the Consumer Price Index Research Series Using Current Methods (CPI-U-RS) and are expressed in 2012 dollars.

Summary statistics for each of the six birth cohorts groups are shown in table 9.1 along with approximate sample sizes. Across cohorts, college graduation rates have more than doubled while the share of women who are currently married has declined slightly.

9.4 Cohort-Age Patterns

9.4.1 Employment

We first describe patterns of work at older ages for women born between 1921 and 1948. Throughout our analysis, employment is defined as having annual administrative earnings (both W-2 wages and self-employment) of at least the year’s prevailing hourly federal minimum wage times ten hours per week times fifty-two weeks per year, as in Goldin and Katz (chapter 1, this volume). Figure 9.2 plots employment rates for five-year birth cohort groups between ages fifty-five and seventy. Because our earnings records

Table 9.1 Summary statistics

SIPP panel	Birth cohort group	Approximate <i>N</i>	College graduate	Married
1984	1921–1925	900	0.12	0.72
1990	1926–1930	900	0.11	0.70
1996	1932–1936	1,200	0.15	0.74
2001	1937–1941	700	0.20	0.68
2004	1940–1944	1,800	0.24	0.68
2008	1944–1948	2,400	0.27	0.68

Sources: The SIPP Gold Standard File linked to Social Security Administration and IRS administrative records.

Notes: Sample is all women who are either the SIPP householder or spouse of the householder, ages sixty to sixty-four at time of SIPP interview, and survive until age seventy. College completion and marital status are measured at time of SIPP interview. Sample is restricted to those with a Personal Identification Key (PIK) that allows linking to the administrative records. The SIPP sample weights are adjusted to account for selection into having a PIK. For each SIPP panel we estimate a logit model for the presence of a PIK as a function of SIPP demographic characteristics and predict the estimated propensity score. We then take the SIPP sample weight and multiply it by the inverse of the estimated propensity score. Resulting weights are used in analysis.

extend from 1978 until 2012, we are unable to observe the earliest and the latest cohorts at extreme ages. Nevertheless, a clear pattern emerges.

Consistent with the theme of this volume, women are working longer—the entire employment path for a more recent cohort is generally above the employment path of previous cohorts. Among women born between 1921 and 1925 (the earliest cohort), only 46 percent worked at age fifty-seven. In contrast, for women born between 1944 and 1948 (the most recent cohort) the employment rate at age fifty-seven was 61 percent. The same pattern holds when women are in their sixties. At age sixty-four, 24 percent of women born between 1921 and 1925 were working compared with 39 percent for women born between 1944 and 1948. These employment patterns provide supporting evidence for the hypothesis that more recent cohorts of women are attached to the workforce longer and therefore are more likely to be eligible for a pension, and in recent years, are more likely to be able to make contributions to an employer-sponsored DC plan or to an IRA.

We explore how changing demographic characteristics of women affect cohort employment patterns in table 9.2. We run linear probability models for work on a full set of age fixed effects covering the age ranges where we have a balanced panel across cohorts. We examine the cohort group coefficients (the 1921 to 1925 cohort is the omitted group) and compare their magnitudes to a second specification where we control for five categories of educational attainment—high school dropout (omitted), high school graduate, some college, college graduate, and advanced degree—and five categories of marital status—never married (omitted), married, widowed,

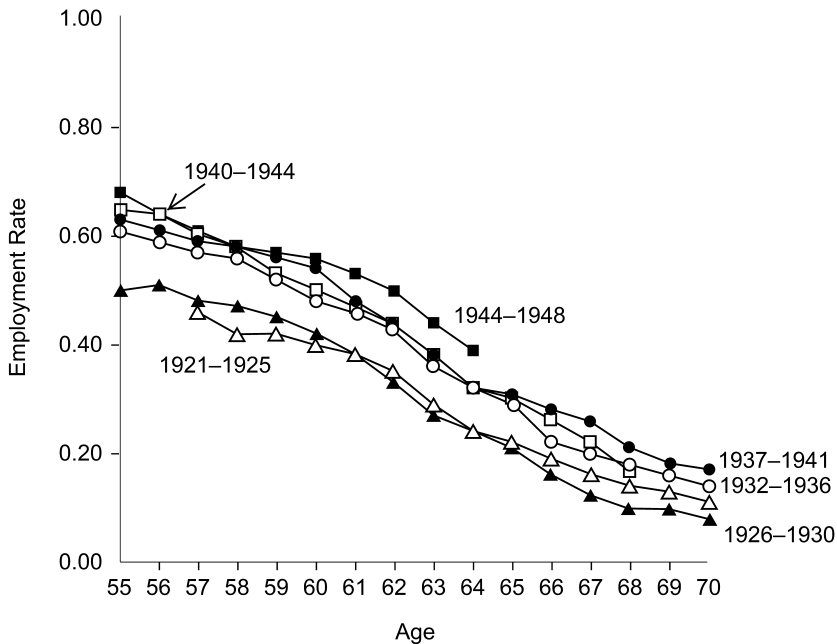


Fig. 9.2 Employment rates for women by age and cohort

Source: The SIPP Gold Standard File linked to Social Security Administration and IRS administrative records.

Notes: Sample is all women who are either the SIPP householder or spouse of the householder, are ages sixty to sixty-four at time of SIPP interview, and survive until age seventy. Women are considered as working in a given year if their total earnings from wages and self-employment in the administrative records are at least equal to the prevailing hourly federal minimum wage in that year times ten hours per week times fifty-two weeks per year.

Sample is restricted to those with a Personal Identification Key (PIK), which allows linking to the administrative records. The SIPP sample weights are adjusted to account for selection into having a PIK. For each SIPP panel we estimate a logit model for the presence of a PIK as a function of SIPP demographic characteristics and predict the estimated propensity score. We then take the SIPP sample weight and multiply it by the inverse of the estimated propensity score. Resulting weights are used in analysis.

divorced, and separated. Not surprisingly, higher levels of educational attainment are strongly associated with labor force attachment. Married, widowed, and separated women are about 13 to 16 percentage points less likely to work than never-married women, all else equal. The coefficients on the later cohorts are somewhat muted after controlling for education and marital status, indicating that some of the trend toward working longer reflects greater educational attainment and reduced marriage, but there are still important cohort effects for women born in the 1930s and 1940s.⁵

5. Note this is an earlier set of birth cohorts than those in the HRS examined by Goldin and Katz (chapter 1, this volume).

Table 9.2 **Employment and income receipt regressions**

Independent variable	Employed (ages 57–64)		Receives Social Security early (ages 62–64)		Receives retirement income (ages 59–64)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cohort (1921–1925 omitted)						
1926–1930	0.009 (0.021)	0.009 (0.021)	0.052** (0.022)	0.049** (0.021)		
1932–1936	0.093*** (0.019)	0.072*** (0.019)	0.031 (0.019)	0.049*** (0.019)		
1937–1941	0.117*** (0.022)	0.072*** (0.022)	0.023 (0.022)	0.060*** (0.022)	0.120*** (0.018)	0.092*** (0.018)
1940–1944	0.104*** (0.020)	0.042** (0.021)	0.000 (0.021)	0.049** (0.021)	0.146*** (0.019)	0.105*** (0.018)
1944–1948	0.150*** (0.020)	0.079*** (0.020)	–0.101*** (0.020)	0.039* (0.021)	0.148*** (0.017)	0.105*** (0.017)
Marital status (never married omitted)						
Married		–0.161*** (0.034)		0.160*** (0.038)		–0.101*** (0.036)
Widowed		–0.129*** (0.037)		0.262*** (0.041)		0.083*** (0.042)
Divorced		0.006 (0.038)		0.079* (0.042)		–0.038 (0.040)
Separated		–0.156*** (0.064)		0.082 (0.081)		–0.110 (0.109)
Educational attainment (less than HS grad. omitted)						
HS grad.		0.140*** (0.016)		–0.017 (0.017)		0.088*** (0.018)

Some college	0.181*** (0.018)	Yes	Yes	Yes	-0.081*** (0.019)	Yes	Yes	Yes	0.122*** (0.018)
College grad.	0.192*** (0.024)	Yes	Yes	Yes	-0.182*** (0.025)	Yes	Yes	Yes	0.167*** (0.025)
Advanced degree	0.302*** (0.026)	Yes	Yes	Yes	-0.263*** (0.028)	Yes	Yes	Yes	0.258*** (0.027)
Age fixed effects		Yes	Yes	Yes		Yes	Yes	Yes	
N		45,656	45,656	17,121		17,121	22,362	22,362	
R-squared		0.040	0.078	0.055		0.095	0.041	0.078	

Source: The SIPP Gold Standard File linked to Social Security Administration and IRS administrative records.

Notes: Sample is all women who are either the SIPP household or spouse of the household, ages sixty to sixty-four at time of SIPP interview, and survive until age seventy. College completion and marital status are measured at time of SIPP interview. In columns (1) and (2) outcome variable is equal to 1 for women who had annual administrative record earnings (combined wages and self-employment) of at least the prevailing federal hourly minimum wage times ten hours per week times fifty-two weeks per year. In columns (3) and (4) outcome variable is equal to 1 for women who had positive annual administrative record income from OASDI. In columns (5) and (6) outcome variable is 1 for women who had positive annual administrative record retirement income from either Form W-2P for years 1978 to 1990 or Form 1099-R for years 1995 to 2012. Sample is restricted to those with a Personal Identification Key (PIK) that allows linking to the administrative records. The SIPP sample weights are adjusted to account for selection into having a PIK. For each SIPP panel we estimate a logit model for the presence of a PIK as a function of SIPP demographic characteristics and predict the estimated propensity score. We then take the SIPP sample weight and multiply it by the inverse of the estimated propensity score. Resulting weights are used in analysis. Standard errors in parenthesis are clustered at the individual level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

9.4.2 Social Security Receipt

Figure 9.3 describes the age pattern of Social Security income receipt across cohorts. Social Security receipt is defined as having any positive amount of annual OASDI benefits in the administrative records. At pre-retirement ages, more recent cohorts are actually somewhat more likely to receive Social Security than are earlier cohorts. This difference reflects the

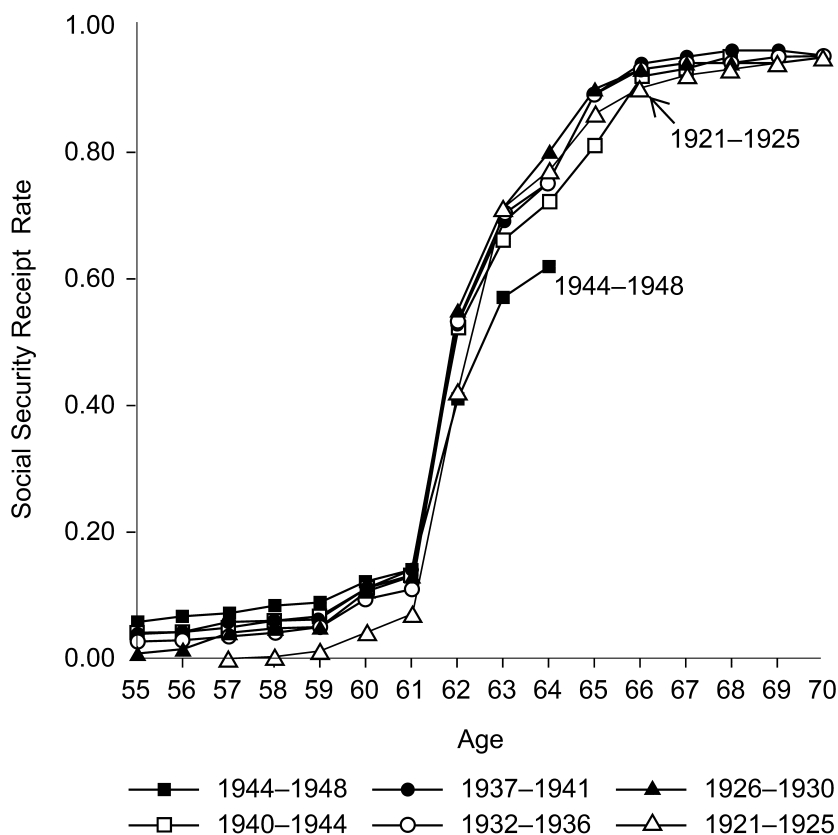


Fig. 9.3 Social Security receipt rates for women by age and cohort

Source: The SIPP Gold Standard File linked to Social Security Administration and IRS administrative records.

Notes: Sample is all women who are either the SIPP householder or spouse of the householder, ages sixty to sixty-four at time of SIPP interview, and survive until age seventy. Social Security receipt in a given year is defined as having positive annual OASDI benefits in the administrative records for that year. Sample is restricted to those with a Personal Identification Key (PIK), which allows linking to the administrative records. The SIPP sample weights are adjusted to account for selection into having a PIK. For each SIPP panel we estimate a logit model for the presence of a PIK as a function of SIPP demographic characteristics and predict the estimated propensity score. We then take the SIPP sample weight and multiply it by the inverse of the estimated propensity score. Resulting weights are used in analysis.

fact that more recent cohorts of women are more likely to be eligible for Social Security Disability Insurance (SSDI) due to their longer earnings histories and also because the medical examination process has become more relaxed (Autor and Duggan 2006). Starting at age sixty-two, and for those below what is known at the “full retirement age,” reduced Social Security retirement benefits are available.⁶ The most recent cohorts of women are less likely to claim Social Security retirement benefits before full retirement age. For example, at age sixty-four, 77 percent of women born between 1921 and 1925 received Social Security benefits but only 62 percent of women born between 1944 and 1948 did. Thus, women are working longer and also claiming Social Security later.

Columns (3) and (4) of table 9.2 explore regression results for Social Security receipt during early retirement years—ages sixty-two to sixty-four. Higher-educated women are less likely to claim Social Security early. Not surprisingly, widows are 26 percentage points more likely to be receiving Social Security benefits than never-married women, all else equal. The cohort effects start declining for women born in the 1930s and turn sharply negative for the 1944 to 1948 birth cohorts. Adding controls for education and marital status produces cohort effects that are more strongly positive, with a smaller drop for the 1944 to 1948 birth cohorts.

9.4.3 Retirement Income Receipt

Estimates of retirement income receipt from SSA and IRS administrative records are shown in figure 9.4. Recall that annual amounts of pension and annuity income as well as periodic withdrawals from employer-sponsored DC accounts and IRAs are included in the definition of retirement income. Transactions that move money from one retirement account to another, such as rollovers and conversions, are excluded. Also important is that we observe receipt of retirement income but not the reason for receipt. Some women may be receiving survivor income that reflects their deceased spouses’ earnings histories rather than their own, although that is less likely at younger ages. Note that data age gaps in figure 9.4 reflect the time period between 1991 and 1994 during which we do not have retirement income data for all members of a cohort group. Nevertheless, the combined series provides novel evidence of an important component of women’s total retirement resources spanning over three decades.

Rates of retirement income receipt rise substantially with age, for example, from 23 percent to 52 percent for the 1937 to 1941 cohort between ages sixty and seventy. Rates also rise across cohorts. At age sixty, the 1921

6. The full retirement age is sixty-five for individuals born before 1938. After 1938, the full retirement age is gradually increased until it reaches sixty-seven for those born after 1959. (See <https://www.ssa.gov/planners/retire/retirechart.html>.)

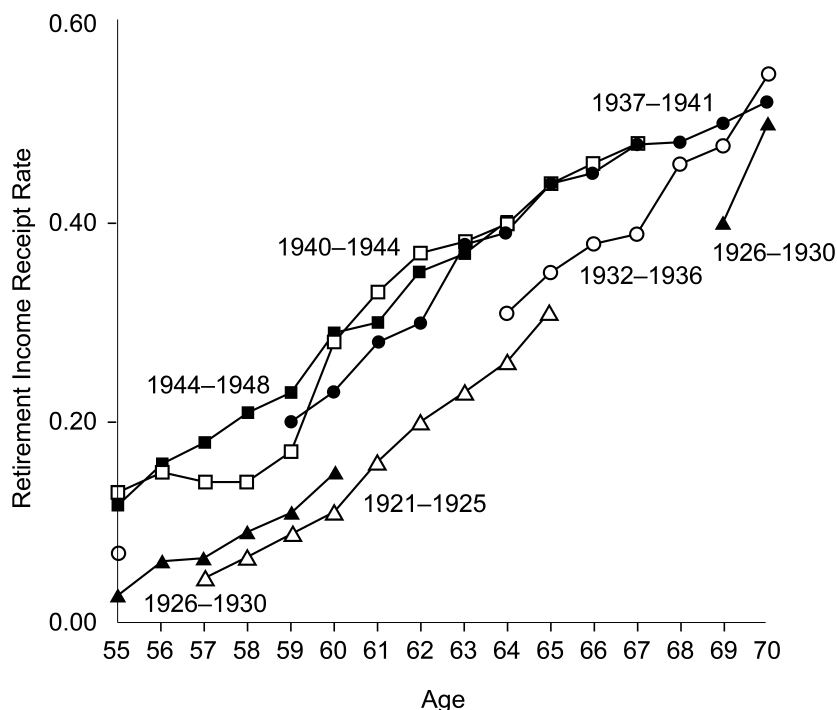


Fig. 9.4 Retirement income receipt rates for women by age and cohort

Source: The SIPP Gold Standard File linked to Social Security Administration and IRS administrative records.

Notes: Sample is all women who are either the SIPP householder or spouse of the householder, ages sixty to sixty-four at time of SIPP interview, and survive until age seventy. Retirement income receipt in a given year is defined as having positive annual retirement income in the W-2P records for years 1978–1990 and in the 1099-R records for years 1995–2012. Retirement income includes pension/annuity income (excluding Social Security) as well as periodic withdrawals from defined-contribution accounts. Gaps in series refer to years 1991–1994 where administrative records are not available. Sample is restricted to those with a Personal Identification Key (PIK), which allows linking to the administrative records. The SIPP sample weights are adjusted to account for selection into having a PIK. For each SIPP panel we estimate a logit model for the presence of a PIK as a function of SIPP demographic characteristics and predict the estimated propensity score. We then take the SIPP sample weight and multiply it by the inverse of the estimated propensity score. Resulting weights are used in analysis.

to 1925 cohort had a rate of receipt of 11 percent while the 1944 to 1948 cohort had a rate of receipt of 29 percent.

These results provide preliminary evidence that is in stark contrast to the CPS-ASEC numbers shown in figure 9.1. While retirement income receipt at advanced ages never exceeds 34 percent in the CPS-ASEC (even conditioning on those receiving Social Security), the administrative data indicate that no cohort observable at age seventy has a rate of receipt lower than 50 percent. We will provide more direct evidence of underreporting in section 9.5.

Regression results confirm that educational attainment strongly predicts retirement income receipt. Widowed women are also more likely than other groups to have retirement income, which would likely include survivor pension income. For recent observable cohorts, the rates of receipt between ages fifty-nine and sixty-four remain about 11 percentage points higher relative to the 1921 to 1925 birth cohorts, after controlling for educational attainment and marital status.

9.5 Cross-Cohort Patterns in Underreporting

We now turn to survey underreporting across calendar years and its implication for measuring the incomes of women across cohorts. Our analysis draws on a series of cross sections based on linked SIPP-administrative data. We compare these administrative measures of income to the stand-alone CPS-ASEC measures. Table 9.3 illustrates the extent of underreporting in 1984, 1989, 1995, 2000, 2003, and 2007. We select women from each survey when they are ages sixty-five to sixty-nine. The first rows compare Social Security receipt and median benefit amounts in the linked data and the CPS-ASEC. Across all years, there is a very close correspondence of both receipt and benefit amounts. The discrepancy in receipt is not more than 3 percentage points in any year. Median benefits conditional on receipt are never different by more than 3 percent. The CPS-ASEC appears to capture Social Security income quite well.

Retirement income receipt shows a very different pattern. Starting in 1984, receipt rates are close and actually higher in the CPS-ASEC with 29 percent of women in the CPS-ASEC reporting retirement income and 23 percent actually having retirement income in the linked sample. Moving to later surveys (and therefore more recent cohorts), the linked sample receipt rates grow rapidly and then reach a plateau, while the CPS-ASEC rates remain essentially flat for the entire time period. By 2007, the CPS-ASEC shows a receipt rate of 26 percent while the linked sample has a receipt rate over 45 percent. In contrast to receipt rates, survey and administrative measures of (conditional) median amounts continue to track each other reasonably well, except for a large discrepancy in 2003 that diminishes in 2007.

Overall, retirement income underreporting appears to occur mostly at the extensive rather than intensive margin. It is also worth noting that due to its rapid growth, the median amount of retirement income in recent years is now quite close to the median amount of Social Security income—the difference is that Social Security receipt remains much more widespread despite retirement income's growing importance.

The bottom half of table 9.3 summarizes the implications for women's total household income. The CPS-ASEC total income as well as income from five sources (earnings, Social Security, SSI, interest and dividends, and retirement income) are reported. We show income based on these five sources alone because this is directly comparable to the income available

Table 9.3 **Income receipt and percentiles by cohorts of women ages sixty-five to sixty-nine**

Income year	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Cohort 5	Cohort 6
	1984	1989	1995	2000	2003	2007
Birth year	1916–1920	1921–1925	1927–1931	1932–1936	1935–1939	1939–1943
Social Security receipt						
CPS	0.906	0.882	0.880	0.874	0.863	0.800
SIPP-linked	0.886	0.877	0.876	0.889	0.890	0.831
Median Social Security amount, cond. > 0						
CPS (\$)	8,246	7,589	8,920	9,262	9,827	10,438
SIPP-linked (\$)	8,361	7,727	8,787	8,980	9,742	10,452
Retirement income receipt						
CPS	0.288	0.289	0.268	0.271	0.272	0.260
SIPP-linked	0.233	0.323	0.399	0.404	0.435	0.454
Median retirement income amount, cond. > 0						
CPS (\$)	5,200	7,429	7,305	8,630	8,668	10,426
SIPP-linked (\$)	4,934	6,801	6,951	8,628	11,132	11,893
Household income						
25th percentile	18,368	20,458	20,810	22,837	21,893	23,138
(1) CPS all sources (\$)	—	19,400	19,933	21,913	21,210	22,485
(2) CPS five sources (\$)	—	22,436	23,235	28,825	26,063	33,714
(3) SIPP-linked admin. (\$)		16	17	32	23	50
Percent diff. (3)/(2)						
50th percentile	33,029	36,050	35,520	40,470	39,453	43,205
(1) CPS all sources (\$)	—	34,780	34,238	39,025	38,310	41,977
(2) CPS five sources (\$)	—	38,689	41,864	50,774	46,755	60,939
(3) SIPP-linked admin. (\$)		11	22	30	22	45
Percent diff. (3)/(2)						

75th percentile

(1) CPS all sources (\$)	55,963	61,774	59,896	68,091	69,011	77,702
(2) CPS five sources (\$)	—	59,696	58,007	65,982	67,367	74,691
(3) SIPP-linked admin. (\$)	—	62,374	67,065	79,914	76,049	95,083
Percent diff. (3)/(2)		4	16	21	13	27

Sources: The SIPP Gold Standard File linked to Social Security Administration and IRS administrative records and CPS ASEC.

Notes: Sample is all women who are either the householder or spouse of the householder, ages sixty-five to sixty-nine at time of interview in either the SIPP or the CPS-ASEC. Social Security receipt is fraction of women with positive annual OASDI benefits either in the administrative records or in the CPS-ASEC. Retirement income receipt is fraction of women with positive annual administrative record retirement income from either Form W-2P for years 1978 to 1990 or Form 1099-R for years 1995 to 2012 or positive amounts of retirement, survivor, or disability income outside of Social Security and VA benefits in the CPS-ASEC. The SIPP sample is restricted to those with a Personal Identification Key (PIK) that allows linking to the administrative records. The SIPP sample weights are adjusted to account for selection into having a PIK. For each SIPP panel we estimate a logit model for the presence of a PIK as a function of SIPP demographic characteristics and predict the estimated propensity score. We then take the SIPP sample weight and multiply it by the inverse of the estimated propensity score. Resulting weights along with CPS-ASEC sample weights are used in analysis. “CPS all sources” refers to total income in the CPS-ASEC while “CPS five sources” includes only earnings, Social Security, SSI, interest and dividends, and retirement income, which are the same types of income available in the linked SIPP-admin. data. Amounts are inflation adjusted using the CPI-U-RS and expressed in 2012 dollars. Total income amounts are unavailable for 1984. The CPS-ASEC retirement income for 1984 includes an estimate of survivor and disability income for that year, which raises the rate by 7 percentage points.

in our administrative records. At the 25th, 50th, and 75th percentiles there is a growing dissimilarity between survey and administrative measures of income that parallels the rise in retirement income underreporting.⁷ For example, the median household income is 11 percent higher in the linked data than in the CPS-ASEC in 1989 (\$3,900), but is 45 percent higher in 2007 (\$19,000). Note that these are household incomes, so they reflect the effects of underreporting of all household members.

The administrative measures of income seriously change our understanding of the economic progress of women at older ages across cohorts. Across the 1921 to 1925 and 1939 to 1943 cohorts, the CPS-ASEC shows an increase in median household income of 21 percent, but the linked data reveal the increase was actually 58 percent. The evenness of economic progress has also been understated. The CPS-ASEC shows a monotonic relationship in income growth across the 25th, 50th, and 75th percentiles of 16 percent, 21 percent, and 25 percent, respectively, but the corresponding numbers in the linked data are 50 percent, 58 percent, and 52 percent.

9.6 Work Experience and Underreporting

If retirement income underreporting has understated economic progress across cohorts, it may also affect our understanding of the relationship between work experience and well-being within a cohort. Table 9.4 uses administrative records linked to the 2013 CPS-ASEC to estimate the relationship between middle to late career work experience and income at older ages for the most recent cohort, those born between 1944 and 1948. We have already established that this cohort is working longer, claiming Social Security later, and is more likely to receive retirement income than previous cohorts. But there is also significant within-cohort variation.

Using administrative record earnings histories, we calculate whether each woman earned enough in a given year for us to deem that she was employed. We then total the years of employment across the twenty-year period between ages forty and fifty-nine. Next we group women into four experience categories based on the total number of years worked (zero to five, six to ten, eleven to fifteen, and sixteen to twenty years). We show the results for the full sample of women as well as separately by current marital status. Overall, 58 percent of women in the 1944 to 1948 cohort worked at least sixteen out of twenty years with a fairly even split across the other categories. The distribution of work experience does not vary much by marital status.

We next examine survey and administrative record measures of retirement

7. We are unable to provide administrative estimates of total income for the 1984 sample at this time, but our preliminary analysis suggests the survey and administrative estimates are quite close in that year.

Table 9.4 Income of retirement-age women by years of work experience between ages forty and fifty-nine (2012)

Work experience between ages 40–59	Distribution of sample (%)	Own retirement income receipt		Median own income			Median household income		
		CPS	Admin.	CPS (\$)	Admin. (\$)	Percent difference	CPS (\$)	Admin. (\$)	Percent difference
All women									
Work 0–5 years	17	0.108	0.154	9,974	8,692	–13	31,220	39,120	25
Work 6–10 years	11	0.163	0.272	12,056	12,132	1	46,406	52,977	14
Work 11–15 years	15	0.250	0.426	16,182	18,863	17	41,867	52,693	26
Work 16–20 years	58	0.377	0.598	26,020	31,686	22	53,875	64,715	20
N = 3,361									
Married women									
Work 0–5 years	17	0.055	0.101	9,195	7,684	–16	44,339	50,138	13
Work 6–10 years	12	0.125	0.228	11,541	11,717	2	60,674	64,551	6
Work 11–15 years	14	0.186	0.353	13,632	15,331	12	58,597	71,146	21
Work 16–20 years	56	0.338	0.572	21,895	28,916	32	68,995	82,609	20
N = 2,032									
Not married women (includes cohabitators)									
Work 0–5 years	15	0.204	0.250	11,802	10,231	–13	15,361	15,211	–1
Work 6–10 years	9	0.247	0.371	13,890	14,227	2	18,508	22,119	20
Work 11–15 years	16	0.343	0.530	19,255	23,075	20	24,051	30,812	28
Work 16–20 years	60	0.435	0.637	30,465	34,781	14	36,314	41,629	15
N = 1,329									

Source: The CPS-ASEC linked to administrative records.

Notes: Sample consists of women ages sixty-five to sixty-nine in the 2013 CPS-ASEC who are either the householder or the spouse of the householder. Years of work experience between ages forty to fifty-nine are calculated as the number of years where annual earnings (wages and self-employment combined) in the administrative records exceed the prevailing hourly federal minimum wage times ten hours per week times fifty-two weeks per year. Marital status is determined as of the CPS-ASEC interview date. The CPS columns refer to amounts reported on the 2013 ASEC survey, while admin. columns refer to amounts after substituting values from administrative records. Admin. sample is restricted to CPS respondents with a Personal Identification Key (PIK) that allows linking to the administrative records. The CPS-ASEC sample weights are adjusted to account for selection into having a PIK. For each year of the CPS-ASEC we estimate a logit model for the presence of a PIK as a function of CPS-ASEC demographic characteristics and predict the estimated propensity score. We then take the CPS-ASEC sample weight and multiply it by the inverse of the estimated propensity score. Resulting weights along with CPS-ASEC sample weights are used in analysis.

income receipt across the experience distribution. The linked CPS-ASEC does show that women whose earnings records indicate they spent more years in the labor force are more likely to report receiving retirement income when sixty-five to sixty-nine years old, with receipt rates rising from 11 percent to 38 percent. But extensive-margin underreporting is present for all four work-experience groups, and the discrepancy is largest in absolute terms for women who work longer, with actual rates ranging from 15 percent to 60 percent. Similar patterns are observed when the sample is restricted to married women, indicating that underreported income is not simply received on account of a deceased spouse.

The next columns of table 9.4 illustrate the effects of underreporting for women's *own* incomes, across the work-experience distribution. Compared with the administrative records, the CPS-ASEC actually shows a somewhat higher median own income for the lowest experience group and only a slightly lower income for the second experience group. For the higher experience groups, which also have the highest extensive-margin underreporting, the administrative record incomes are a substantial 17 and 22 percent above the survey incomes. Qualitatively similar results are found for both currently and not currently married women.

One implication of these findings is that if future cohorts of women acquire additional years of work experience, household surveys may miss a larger fraction of their own incomes at older ages. However, the relationship between women's work experience and *household* income is less straightforward, as there is considerable evidence of income underreporting across most work experience groups. The relationship is complicated by the fact that underreporting is also present for other household members who live with women of all experience levels.⁸

Despite the weaker relationship found between women's work experience and household income underreporting, there are still household income anomalies in the CPS-ASEC that the administrative records help to clarify. For example, for married women, survey income does not rise monotonically with women's work experience. Women who work six to ten years have a median household income of \$60,700, while women who work eleven to fifteen years have a median household income of \$58,600. Using the administrative records, median incomes are instead ascending for the two groups—\$64,600 and \$71,100.

9.7 The Retirement Transition

We have so far explored how underreporting affects women's total incomes at a point in time. We can also exploit the panel nature of the administrative

8. As noted in the introduction, Bee and Mitchell (in process) find high rates of underreporting for both women and men. This explains why *household* income underreporting can be substantial, even among women with few years of labor market experience.

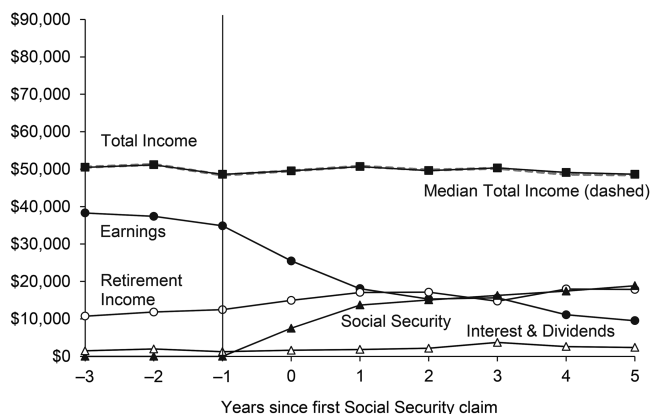
records to track the same women's incomes over time. We focus on a period covering the transition to retirement and examine to what extent women are able to maintain their preretirement living standards.

We draw a sample of women from the 2008 SIPP panel. We use only the most recent SIPP panel because we require data on all types of income for many consecutive years. Like our previous analyses, our sample consists of women who are either the householder or spouse of the householder, who either themselves or their husbands (if present) first claimed Social Security between 2003 and 2007, and who were age sixty to seventy when claiming. We further restrict to those claiming nondisability benefits. Our nine-year panel window runs from three years prior to first claiming benefits until five years after claiming. We also require women to survive to the end of the panel window but place no mortality restrictions on the husband, if present. One limitation of our analysis is that we only can observe women's living arrangements at the time of the SIPP interview. Therefore, for this exercise we choose to track the total incomes of either the married couple or the not-married women, fixing the marital status at the time of the SIPP interview. However, we do observe mortality of husbands in the administrative records and we equivalence-adjust total incomes in each year to reflect whether our unit of analysis has one or two people.⁹ A second limitation of our analysis is that we can follow women only for five years after claiming because our administrative records are available only through 2012. We could therefore miss important income changes that take place later on in retirement.

Figure 9.5, panel A, plots the mean of the 45th to 55th percentile of equivalence-adjusted overall income in each year for the full sample of women. As shown, the mean of the 45th to 55th percentile is a very close approximation to the median and has the added advantage that it can be decomposed into income-source subcomponents (also plotted). These subcomponents are Social Security income, earnings, interest and dividends, and retirement income. By construction, Social Security income is zero in the years prior to claiming and then rises sharply after claiming. Five years after claiming, average equivalence-adjusted Social Security benefits, for those in the middle of the total income distribution, are a little under \$19,000. Not surprisingly, income from earnings declines as women and their husbands transition to retirement. Earnings fall from \$38,000 to \$35,000 in the years before claiming and then accelerate their decline until they are just under \$10,000 five years after claiming. Interest and dividends are a comparatively small amount of income for most households in all years with a value of just \$2,400 five years after claiming. Average amounts of retirement income, on the other hand, are substantial. Three years prior to claiming they average close to \$11,000, and rise after claiming to nearly \$18,000. Thus, average

9. We use the same equivalence scale that is used for the Supplemental Poverty Measure. In practice, this simply means dividing our couples' incomes by 1.41. (See Short 2015.)

A. All Women



B. College Graduate Women

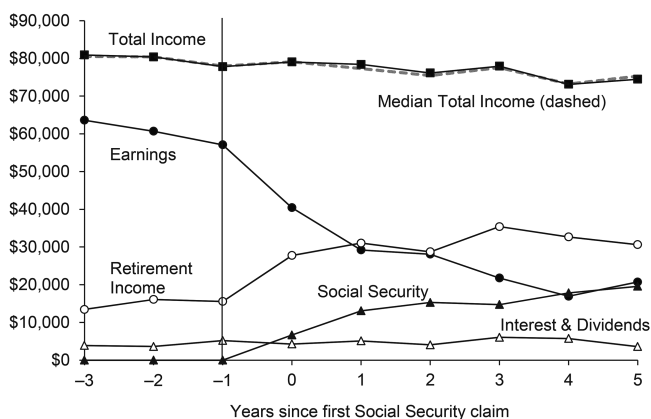
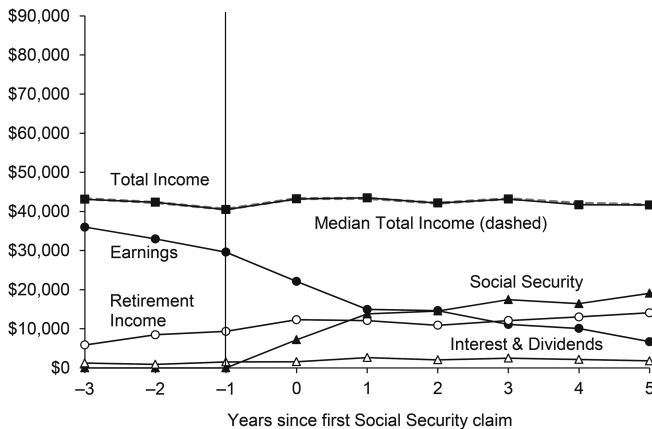


Fig. 9.5 Mean of the 45th–55th percentile of total income and its subcomponents

Source: The SIPP Gold Standard File linked to Social Security Administration and IRS administrative records.

Notes: Panel A: All women. Sample is all women from 2008 SIPP panel who are householder or spouse of householder, either first claimed or their spouse (if present) first claimed Social Security benefits between 2003 and 2007, did not claim disability benefits, and survived for full nine-year window. Panel B: College-graduate women. Sample is college-graduate women from the 2008 SIPP panel who are householder or spouse of householder, either first claimed or their spouse (if present) first claimed Social Security benefits between 2003 and 2007, did not claim disability benefits, and survived for full nine-year window. Panel C: Non-college-graduate women. Sample is non-college-graduate women from the 2008 SIPP panel who are householder or spouse of householder, either first claimed or their spouse (if present) first claimed Social Security benefits between 2003 and 2007, did not claim disability benefits, and survived for full nine-year window. Panel D: Married women. Sample is married women from

C. Non-College Graduate Women



D. Married Women

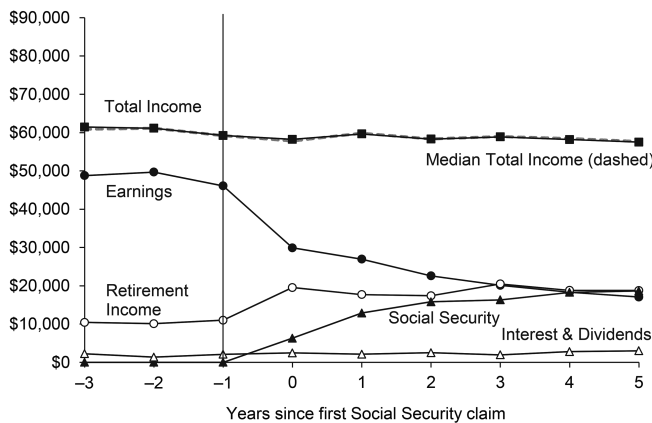
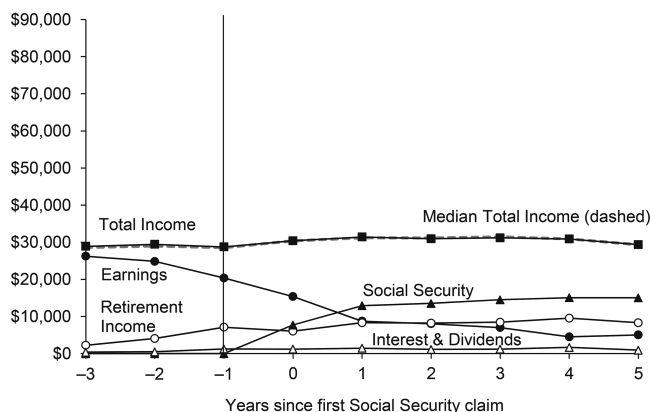


Fig. 9.5 (cont.)

the 2008 SIPP panel who are householder or spouse of householder, either first claimed or their spouse (if present) first claimed Social Security benefits between 2003 and 2007, did not claim disability benefits, and survived for full nine-year window. Panel E: Not-married women. Sample is women from the 2008 SIPP panel who are not currently married and are the householder, either first claimed or their spouse (if present) first claimed Social Security benefits between 2003 and 2007, did not claim disability benefits, and survived for full nine-year window. Total income is the sum for the women and her spouse (if present) of administrative record amounts of earnings, Social Security, interest and dividends, and retirement income. Income amounts are equivalence-adjusted by dividing by 1.41 for married couples. (See Short [2015] for more details.) Marital status is determined as of SIPP interview date but is adjusted if administrative records indicate death of husband. Incomes are inflation-adjusted using the CPI-U-RS deflator and are expressed in 2012 dollars. Mean of the 45th–55th percentiles in each year is calculated as well as the median for total income. Mean amounts of

E. Not-Married Women

**Fig. 9.5 (cont.)**

each subcomponent of total income are also displayed for those with total incomes in the 45th–55th percentile range. Sample is restricted to those with a Personal Identification Key (PIK), which allows linking to the administrative records. The SIPP sample weights are adjusted to account for selection into having a PIK. For each SIPP panel we estimate a logit model for the presence of a PIK as a function of SIPP demographic characteristics and predict the estimated propensity score. We then take the SIPP sample weight and multiply it by the inverse of the estimated propensity score. Resulting weights are used in analysis.

retirement income and Social Security amounts are quite comparable for those in the middle of the overall income distribution.

When we examine income from all sources combined, we find that median incomes are surprisingly flat across the full nine-year window, with an approximate value of \$48,600 both one year before claiming and five years after claiming. In other words, there is little evidence of a drop in median income at retirement and up to five years after retirement. This is in sharp contrast to several previous studies reviewed earlier that suggest substantial drops in income (and consumption) at retirement. Indeed, the premise of the retirement consumption puzzle is that incomes are falling predictably at retirement and that rational, forward-looking households should be able to smooth consumption in response. Although we cannot measure consumption changes directly, our finding of steady incomes surrounding retirement challenges this premise. Crucial to this result is an accurate measure of retirement income from the administrative records.

We also plot event studies separately for college-graduate and non-college-graduate women and for currently married and not currently married women as shown in figures 9.5, panels B, C, D, and E. While the levels of income are quite different across demographic subgroups, the same story holds—total incomes do not fall very much, if at all, in retirement. The big-

gest drop is for college-educated women where the level of overall income starts higher at around \$77,800 one year before claiming and falls to \$74,500 five years after claiming. Even this modest drop takes several years to materialize—we never observe a sharp fall in incomes. For women without a college degree, incomes, if anything, rise slightly over the same period from \$40,500 to \$41,700. For married women, incomes decline modestly from \$59,200 to \$57,500 and for not-married women, incomes rise slightly from \$28,800 to \$29,400.

Beyond total incomes, it is interesting to examine the relative importance of retirement and Social Security income across demographic groups. Five years after claiming, retirement and Social Security income are roughly equally important for middle-income women in the full sample. That is, they account for 37 percent and 39 percent of total income, respectively, for women in the middle of the total income distribution. For college-graduate women, retirement income accounts for 41 percent of the total compared to 26 percent for Social Security. For non-college-graduate women, Social Security is the more dominant income source at 46 percent of the total, although retirement income still makes up an important 34 percent. For married women, the two income sources are equally important at 32 percent, but for not-married women, Social Security makes up 51 percent of the total, compared with 28 percent for retirement income.

Our findings on women's transition to retirement and the relative importance of retirement income require two caveats. First, our sample consists of those claiming OASI benefits. This removes from the sample those who experience permanent health shocks that would qualify them for SSDI, but who would also likely have declines in their overall incomes. It also ignores the group that has too little earnings to qualify for any Social Security and is instead receiving SSI. Meyer and Mok (2013) show that consumption does, in fact, decline after workers become disabled. However, from the perspective of validating the life cycle model, we would expect consumption to decline exactly for those who do experience negative permanent income shocks. Thus, the life cycle model cannot easily be tested against alternatives in this setting.

Second, although we have provided strong evidence that women's incomes do not fall during the first five years after retirement, this does not necessarily imply that women and their families have saved adequately for retirement. It is still possible that they could "run out of money" in future years should they live longer than expected, incur higher out-of-pocket medical expenses than expected, and have their retirement income exhausted. Relatedly, this analysis examines women (and their husbands) who retired in the middle of the first decade of the twenty-first century, a time where retirees still had considerable retirement income from defined-benefit plans. Our results may not extrapolate to future cohorts, who will only have access to defined-contribution accounts. Will they save adequately for retirement during work-

ing years and then manage to budget their savings during retirement, given that annuitization rates in defined-contribution accounts remain low (Hurd and Panis 2006)?

9.8 Conclusion

We have shown that as women increased employment across cohorts born from the early 1920s to the late 1940s, they also received greater amounts of retirement income at older ages. The CPS-ASEC, however, fails to reflect the growing importance of retirement income and thus understates the economic progress of women in retirement. The CPS-ASEC has recently been redesigned to improve measures of income received from several sources, including retirement accounts. It remains an open question whether the redesign will better capture retirement incomes of future cohorts of women as they continue to work longer.

We have also shown that recently retired (nondisabled) women do not experience noticeable declines in total income at retirement. The finding is in sharp contrast to others in the literature on the retirement consumption puzzle. Our results cast doubt on the ability to convincingly test the life cycle model in this setting. They also imply that total income replacement rates are quite high, at least five years into retirement. Most employee retirement plans are currently completing a transition from defined-benefit to defined-contribution-based systems. We began with a puzzle that we believe we have solved. We end with the question: Will future cohorts of women continue to maintain their preretirement standards of living as we have shown past cohorts have done?

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