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Changes in Income Among Senior Citizens: 1982-2018

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Introduction

The United States is in the midst of a major demographic transition. The post-World War II baby boomers have reached retirement age and are living longer than previous senior citizen cohorts. The large and growing number of retirees is already straining federal finances. In 2018, federal spending on persons age 65 and older accounted for 40 percent of non-interest federal budget and their claim on the budget will grow to 50 percent by 2029 (CBO 2019). Driven largely by spending on seniors, the annual budget deficit will permanently exceed 5 percent of GDP beginning in 2028 (CBO 2022). Medicare's Hospital Insurance program will be unable to pay full benefits in six years, and Social Security will be unable to do so by 2035. The fiscal pressures created by the aging population warrant an examination of senior citizens' incomes and the role federal transfer payments play in supporting their financial well-being.

This paper uses the Survey of Consumer Finances (SCF), supplemented by the Current Population Survey (CPS), to document changes in the household incomes of seniors and the sources of these changes. We examine senior household incomes from 1982 to 2018, both in absolute terms and relative to income trends of younger households. Our analysis documents a substantial and broad-based growth in senior incomes that far outpace income growth among non-senior households. The strong income growth occurs across the senior income distribution, among age sub-groups, household types, and education levels of household heads. Importantly, the remarkable income gains would have occurred even if the growth in per recipient Social Security benefits had been capped at inflation.

The starting year of our analysis, 1982, coincides with major changes in federal retirement policies. In 1982, the modern method of determining Social Security benefits became fully effective, final IRS regulations governing newly created employer-sponsored 401k plans were issued, and Individual Retirement Accounts, which were created in 1974, were still in their infancy but growing

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rapidly. Additional policy changes in each of these retirement income vehicles occurred throughout the ensuing years. IRA and 401k contribution limits were significantly expanded and, as a result, an entire defined contribution plan industry grew to maturity. Meanwhile, Social Security's full retirement age was increased, and the earnings test was repealed for persons claiming benefits at this age. In addition, historic changes occurred in older workers' employment patterns. In the mid-1990s, employment ratios of both older males and females reversed their long-term secular declines. By 2019, the female employment ratio had risen to record-high levels, while the male employment ratio had risen to a level not seen in 50 years. The extended period covered by our analysis allows us to incorporate the impact of these revolutionary policy and labor market changes on retirees' well-being.

From 1982 to 2018, the median inflation-adjusted income of households headed by a person 65 years or older (termed senior households) increased by 85 percent.[2] The increase in senior income far outstrips the increase among younger households. The median income among senior households rose nearly four times faster than the median among households headed by persons under age 65 (termed non-senior households) in the SCF. It rose three times as fast in the CPS. Senior incomes have always been less than non-senior incomes, but seniors are rapidly catching up. After accounting for the smaller size of senior households and their lower tax burden, median senior income is now equal to that of non-seniors, as measured by the SCF and nearly equal as measured by the CPS. The upward movement of senior incomes has produced a remarkable convergence between the senior and non-senior income distributions. In 1982, only one-in-every-three senior households had incomes that would place them in the middle 50 percent of the U.S. income distribution. In 2018, nearly half of all senior households (49 percent) have such incomes, placing them firmly in the U.S. middle class.

The primary drivers of senior household income growth are income from private retirement plans and employment earnings. Among all senior households, retirement plan income more than quadrupled and labor earnings more than doubled from 1982 to 2018. Together, they account for nearly 60 percent of the increase in senior household income over that period. Meanwhile, although inflation-adjusted Social Security benefits grew by 66 percent, its growth accounts for only 18 percent of the senior household income increase.

[2] Throughout the paper, we use the PCE price index to adjust prices.

Income from all three of these sources grew substantially among seniors in both the lower and upper halves of the senior income distribution. Retirement plan income and labor earnings played the dominant role in raising incomes among upper-income households. Social Security income, which increased by 71 percent, played only a minor role, contributing only 14 percent to total income. Among lower-income senior households, Social Security income increased 58 percent. Yet, this increase accounted for over half of the increase in their household income.

These findings have implications for Social Security reform. Social Security's wage-indexing method for determining initial benefits has been in place for over 40 years. One of its main objectives was to ensure that the standard of living enjoyed by senior citizens kept up with that of the working-age population. The remarkable rise in senior household income in both absolute terms and relative to working age households indicates this policy objective has not only been met—it has been exceeded. But we find that wage indexing played little or no role in this achievement. Had Congress adopted a policy of price indexing rather than wage indexing in 1977, the median senior household income would be only 6 percent lower in 2018. The median income of senior households in the lower half of the senior income distribution would have been only 10 percent lower. Inflation-adjusted incomes of both groups would have still increased by 75 percent since 1982, three times faster than the growth among younger households.

Wage indexing put Social Security's finances on a path to insolvency. Had Congress adopted price indexing, the program would now be running annual cash surpluses and its looming insolvency would have been entirely averted. Thus, the policy objective of ensuring that seniors' living standards keep up with the rest of the population could have been achieved without jeopardizing the program's financial future. Equally important, our findings raise questions about continuing the current Social Security benefit formula's degree of progressivity. The creation of IRAs and 401ks have reduced the reliance of middle- and upper-income seniors on Social Security. Lower-income seniors, in contrast, continue to rely heavily on Social Security benefits.

The income growth findings will be unsurprising to scholars familiar with the literature on the income of seniors. Similar trends have been documented by researchers at NBER, Boston University, the University of Michigan, the Social Security Administration, the Bureau of the Census, AEI, and work by others published in the Social Security Bulletin.[3] For these scholars, the results

[3] The list of studies is too large to attempt to list them without inadvertently omitting important papers. Major studies that have documented senior income growth are by Hurd (1990), Purcell (2009), and Poterba (2014). More recently, Andrew Biggs (2020) has documented the growth in senior incomes since the late 1970s using the CPS.

reported here are updates to earlier work and should bolster confidence in previously identified trends. All readers, however, should find our application of the income growth trends to Social Security new.

The paper is organized as follows. Section 1 provides an overview of the data. Section 2 documents the growth in senior incomes both in absolute terms and relative to the income of younger households. Sections 3 analyzes the sources of senior household income growth. Section 4 examines the effects of a price-indexing policy on senior household incomes and the financial status of the Social Security Trust Fund. Section 5 offers concluding thoughts.

1 Overview of Data Sources

The analysis is based primarily on the Survey of Consumer Finances (SCF) income data from calendar years 1982 to 2018. We use the Current Population Survey (CPS) to check the accuracy of the SCF findings and clarify trends observed in the SCF data. In this section, we discuss the advantages and shortcomings of each survey, and explain necessary imputations made to reconcile differences across survey years. We also report relevant demographic characteristics of senior households in the SCF.

1.1 Survey of Consumer Finances

The Survey of Consumer Finances is a triennial survey sponsored by the Federal Reserve conducted on a moderately sized sample of U.S. households. We use data from the 1983 to 2019 surveys, which provide annual income estimates for 1982 to 2018.[4] The survey's detailed information on income and assets makes it particularly well-suited to study senior incomes. Indeed, the survey has been referred to as the "gold standard" for this purpose.[5]

The SCF, like all major household surveys, has several potential shortcomings for analyses of incomes. These shortcomings and our methods for addressing them are discussed in detail in Cogan and Heil (2022). They are briefly mentioned here. First, the sample sizes of senior households are not large, ranging from a low of 678 in the 1983 survey to a high of 1,449 in the 2016 and 2019 surveys. These modest sample sizes are sufficient for most analysis, but they limit detailed distributional analyses of individual income sources.

[4] We exclude the 1986 survey, which was designed as a supplement to the 1983 survey.
[5] Chen, et al (2018). Their study finds that the 2016 SCF captures 98 percent of aggregate income among seniors, 99 percent of retirement plan income, 106 percent of interest and dividends, and 95 percent of Social Security income. Earlier work by Czajka and Denmead (2008, 2011, 2012) also finds that the SCF paints a far more accurate measure of retirement income than the CPS. Dettling, et. al (2015) reports that aggregate incomes from the SCF closely match aggregate income from NIPA.

Second, the SCF from 1989 to 2019 combine prior-year Social Security benefits with prior-year private pensions into a larger "pension income" category. We have used separately reported current-year monthly Social Security and employer-provided pension benefits to estimate prior-year amounts of Social Security and private pension benefits. The method, which is described in Cogan and Heil (2022), preserves the value of prior-year household income at its originally reported value. The 1983 SCF survey, in contrast to subsequent surveys, separately identifies prior-year Social Security and employer-provided pension income, but significantly underreports Social Security spousal benefits.[6] We have corrected this underreporting by imputing a spousal benefit. The imputation equals 50 percent of a spouse's reported benefit for any married person age 62 or older who does not report receiving Social Security benefits and who is not employed.[7] We apply the same imputation to the 1995–2001 surveys, which suffer from a similar undercount issue. The correction affects the allocation of Social Security income between spouses but does not affect either household Social Security benefits or household income.

A third potential shortcoming is that income from defined contribution plans is significantly underreported in the surveys prior to 2004.[8] The underreporting may distort income comparisons between years before and after the 2001 survey. But the size of the distortion should be small. As noted earlier, IRAs and 401k plans, now the dominant types of defined contribution plans, were in their infancy in the early 1980s. In 1983, for example, only 11 percent of senior households reported assets in an employer-sponsored defined contribution plan or IRA and only a fraction of these households would have withdrawn income in the previous year. Even in later years when withdrawals are more accurately measured, they account for only a small fraction of income. During the years from 2003 to 2018, when 41 percent of senior households were enrolled, income from these plans added an average of only 6 percent to mean senior household income. To correct this underreporting, we impute withdrawals to senior households during the survey years from 1983 to 2001. The imputation procedure, which is discussed more fully in Cogan and Heil (2022), uses regressions applied to the data for survey years from 2004 to 2019 to predict expected withdrawals

[6] Compared to the 1983 CPS, which provides relatively good measures of Social Security benefits, the 1983 SCF reports only about half (53 percent) of married women received Social Security benefits.
[7] This correction brings the number of married women who receive spousal benefits more in line with the CPS number. This imputation does not affect estimates of total household income, which are based on the combined pension and Social Security variable.
[8] In the pre-2004 surveys, withdrawals from IRAs and employer sponsored defined contribution plans were obtained from a catch-all question in which respondents were asked about prior-year income from "other sources." In 2004, the Federal Reserve significantly changed how information on defined contribution plan withdrawals was obtained.

among defined contribution plan participants. As shown in Table 1, the imputations have minimal impact on senior household income in the 1980s. A larger—but still small effect—is found in the early-to-mid 1990s with the largest impacts occurring in 1997 and 2000.

Table 1. Effect of DC imputations on senior incomes

	Median	Mean
1982	0.0%	0.5%
1988	2.0%	1.2%
1991	2.4%	1.6%
1994	2.7%	2.9%
1997	5.3%	3.7%
2000	3.4%	4.3%

Notes: Imputations are described in Cogan and Heil (2022).

A fourth shortcoming is that the SCF sampling unit differs from the traditional household unit used in most other surveys, including the CPS. In addition, the sampling unit used to define households in the 1983 survey (termed the primary family unit (PF)), differs from the unit of analysis in the subsequent survey years (termed the primary economic unit (PEU)). The PF consists of all persons living together who are related by blood, marriage, or adoption, i.e., the household head, spouse, and their relatives. The PEU consists of an economically dominant person or persons and other household members that are financially dependent on that person or persons.[9] As a result, SCF household income in all survey years excludes the income of household members who are not in the primary family in 1982 or PEU in subsequent surveys.[10] In Cogan and Heil (2022), we examine the impact of the change in the SCF definition of households on household income over time. We find that the changes do not materially affect measures of income growth.[11]

[9] While the PEU includes all household members that are financially dependent on the head and the PF includes all family members, the income questions likely reflect only the income of the respondent and spouse, if present. This is despite the fact that the annual income questions are intended to capture the income of all PEU/PF members. For example, earnings from dependent children should be captured, but as noted in Gale, et al. (2022), "in practice the family earnings value is generally just the sum of the [respondent's] and [spouse's] earnings reported in the labor modules" (page 3).

[10] The 1983 survey only includes the income of the primary family, but starting with the 1989 survey, the SCF also includes the income of household members other than PEU members (called an NPEU members). Unfortunately, these surveys do not include a breakdown of these members income by source. To have a consistent definition of household income across all years, including the 1983 survey, and to allow identification of all sources of household income in each year, we use the PEU (or PF in 1983) as the household unit throughout our analysis. There is one exception: when we examine the impact of adjusting 2018 household income for household size. For that examination, we use the broader definition that includes the income from financially independent household members.

[11] Including the income of non-financially dependent members adds anywhere from 2 to 8 percent to the median senior household income from 1988 to 2018. Including this income would raise the growth in senior median incomes between 1988 to 2019 from 73 percent to 74 percent. Among non-senior households, the inclusion of income of non-financially

1.2 Current Population Survey

We use the annual data from the March Current Population Survey (CPS) to clarify and extend certain findings from the SCF data. The annual availability of the survey, its large sample sizes, and detailed information on income and employment make it attractive for many purposes albeit with significant limitations.[12]

The CPS's shortcomings as a source of income information on seniors has been the subject of much attention. The survey is designed to measure income primarily from "regular" sources. Thus, it underreports withdrawals from defined contribution plans and income from assets held outside of retirement plans.[13] A major survey redesign in 2014 and other changes since then have improved the reporting of these income sources, but recent studies show that the survey still significantly underreports income from both sources.[14] The underreporting and survey improvements since 2014 make identifying long-term trends in senior incomes problematic. Nevertheless, since defined contribution plan income in the early 1980s was negligible and the CPS still underestimates defined contribution income after the survey redesign, we can be reasonably confident that CPS's measured income growth between the 1980s and recent years understates its true growth. Identifying the true trend in income from assets held outside of retirement plans, which includes income from real property sales, capital gains, interest, and dividends, is more problematic. Unlike defined contribution plan income, income from non-retirement plan assets was an important income source for seniors in the early 1980s and, according to the SCF, its importance has declined over time. In combination, the improved reporting and the decline in importance make drawing inferences from the CPS about the true trend in non-retirement asset income especially difficult.

1.3 Senior demographics

Accounting for demographic changes among seniors is potentially important to understanding the factors that drive trends in senior income. Here, we discuss three changes in demographics that may affect senior incomes: marital status, householder age, and education attainment.

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dependent members increases the 1988 to 2018 growth in the median household income only slightly, from 11 percent to 17 percent. Differences between the two household income measures are more fully discussed in Cogan and Heil (2022).

[12] The number of senior households in the CPS ranges from a low of 10,362 in the 2001 survey to a high of 16,841 in the 2019 survey.

[13] See Schieber (1995) and Woods (1996).

[14] For example, see Chen, et al. (2018), Czajka and Denmead (2012), and Bee and Mitchell (2017).

Table 2 reports basic demographic information on senior households (defined as households where the head is age 65 or older) in the 1983 and 2019 SCF. The proportion of senior households that are married couples appears to show little change over the 36-year period. There has, however, been a sizeable shift in composition toward males living on their own and away from females living on their own.[15] The age composition in the SCF data also shows only small changes over time. There is a slight increase in the share of households headed by a person age 75 or older and a correspondingly small decline in the share of households headed by persons age 65 to 69. These data rule out changes in senior household types and ages of head of household as important sources of in changes in senior household income over time.

Table 2. Demographic characteristics of senior householders

	1983	2019
Marital status		
Married	52%	49%
Single female	39%	35%
Single male	9%	16%
Age		
65-69	35%	32%
70-74	29%	26%
75 and older	37%	41%
Education		
High school or less	77%	37%
Some college	12%	26%
Bachelors or higher	11%	37%

Notes: Data are from SCF. For consistency with income analysis, ages reflect the imputed age of the respondent at the end of the previous year.

In contrast, education levels of senior household heads have increased significantly over time. The proportion of senior household heads who have completed a college education has

[15] The distribution of senior households by household type in the SCF differs somewhat from the distribution in the CPS. The share of SCF senior households with married couples is between 3 percent and 17 percent higher than the CPS in all years except 1991. Also, the CPS does not show as large a shift between single male and single female headed households. These differences are not large enough to affect our conclusions about the level or growth in senior household income in any significant way. Married couples also constitute a consistently larger share of non-senior households in the SCF. The differential increases over time from an average of 5 percent in SCF survey years in the 1980s to 21 percent in SCF survey years in the last decade. Since incomes of married couple households, tend to be larger than those of households headed by single persons, the faster growth of non-senior SCF married couple households would impart a faster overall income growth in the SCF than in the CPS. But the impact is modest. Reweighting the mean incomes of each household type in the SCF by the CPS household type shares lowers the measured mean non-senior income growth from 1982 to 2019 by 9 percentage points.

tripled, while the proportion who attained only a high school degree or less fell by more than 50 percent. The increase reflects the profound difference in the accessibility of, and attitudes toward, a college education before and after World War II. Seniors who were age 70 in the mid-1980s reached college age during the Great Depression. Several years later World War II began. By the end of World War II, this age group was in their late 20s, ready to start work and families. College was not a priority. Seniors who were age 70 in 2018, in contrast, reached college age in the late 1960s when opportunities for, and expectations about, college education were far greater.[16]

2 Income Trends by Age Group

Figure 1 displays median income levels of senior and non-senior households and the ratio of the two.[17] The income figures and all financial numbers hereafter are expressed in constant 2020 dollars, using the PCE price index. Relative to other inflation metrics, such as the CPI-U or the CPI-W (the index used for Social Security's annual cost-of-living adjustments), the PCE grows more slowly over the period analyzed.[18] We consider the effect different inflation metrics have on our conclusions below and in appendix D. Ultimately, the choice of price index affects the magnitude of our estimated income growth but does not materially affect our conclusions about senior income growth.

The median income of senior households shows substantial growth that begins possibly as early as the mid-1990s or as late as 2000 when year-to-year differences first become statistically significant. Over the entire period from 1982 to 2018, median senior household income increased by a substantial and statistically significant 85 percent. Meanwhile, the median income of non-senior households remained relatively constant for most of the period, rising only toward the end. By 2018, the median was only 23 percent higher than the 1982 median.

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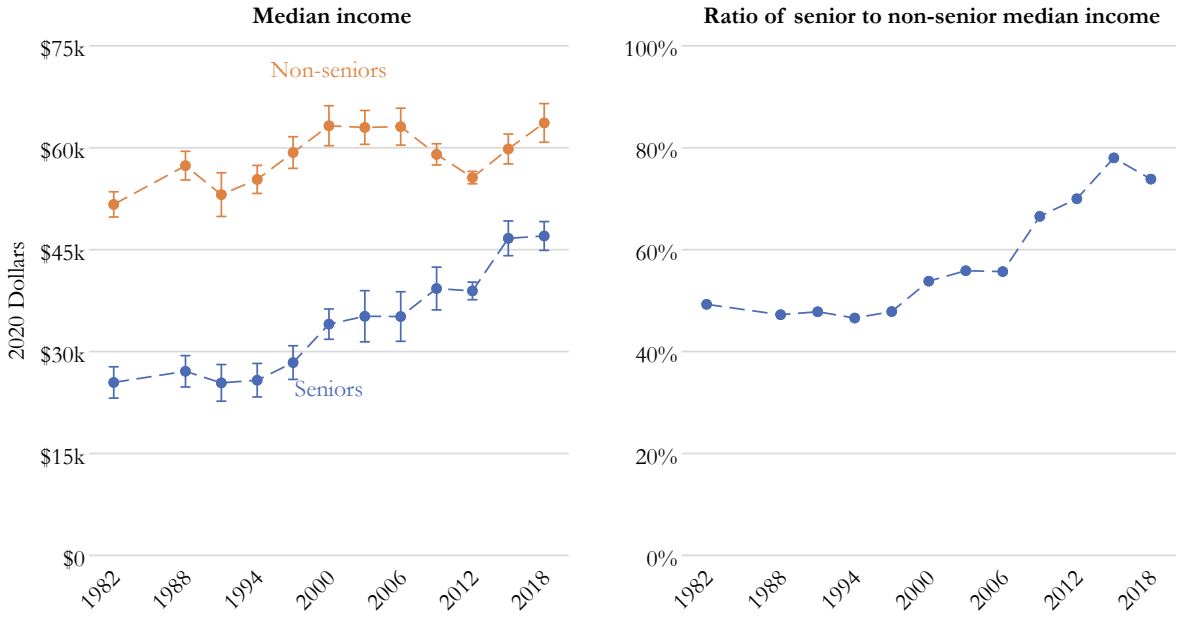
[16] The changes in demographic characteristics among non-senior households between 1983 and 2019 are similar but smaller. These changes are presented in the appendix. The percent of non-senior household heads with a high school education or less declined by 38 percent. The percentage of non-senior heads who completed a college education rose by 64 percent compared to the nearly four-fold increase among seniors.

[17] Beginning in 1988, the confidence intervals shown for SCF statistics are calculated using the user-generated Stata package SCFSES. This package calculates standard errors that account for the imputation and sampling variability in the SCF. The package is available at https://github.com/crafkin/scfses. For more details, see appendix B in Beshears, et al. (2018). The SCF's multiple imputation method creates five values (called implicates) for each missing response. This allows researchers to estimate standard errors that reflect the uncertainty introduced by the imputations. As described in Cogan and Heil (2022), we perform additional imputations for defined contribution withdrawals, pension benefits, and Social Security benefits. These imputations are specific to each implicate, but we do not account for imputation error introduced by our imputations. This omission will not affect our point estimates but will yield lower, less conservative standard errors.

[18] Over the period covered by our data, 1982 to 2018, the CPI-W grew 19 percent faster than PCE and the CPI-U grew 24 percent faster.

Figure 1. Median income for senior and non-senior households



Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Bars reflect the 95 percent confidence interval.

As the ratio of the two medians shows, senior incomes have remained below those of non-seniors, but seniors are rapidly catching up. Median senior household income growth is four times the growth among younger households. In 1982, the median income among senior households was only 49 percent of the non-senior median income. By 2018, it was 74 percent. The growth in senior income relative to non-senior income appears to begin in the mid-to-late-1990s. The growth from 1997 forward in time accounts for all of the increase in senior income relative to non-senior income over the entire period.

There is some concern that the PCE may not accurately reflect changes in the cost of living among seniors because health care expenses comprise a larger share of their household budgets than these expenses do in the typical U.S. household's budget. If so, use of the PCE to deflate income overstates both the true absolute and relative growth in senior income over time. As a check, we recomputed the growth in inflation-adjusted income among senior households using the R-CPI-E, which the BLS has constructed to distinguish between the cost of living of senior and non-senior households. The change in price indices does not materially affect our conclusions about senior income growth. The real income growth from 1982 to 2018 using the R-CPI-E declined to 56 percent from 74 percent using the PCE. Most of this difference, however, is due to differences in the methods of construction between CPI-based measures and the PCE, and not to health care

expenses. To illustrate, using the CPI-U to account for inflation reduced the estimate of senior real income growth to 62 percent. We also recomputed the relative growth in senior to non-senior household income. For this calculation, we used the much more rapidly growing CPI-U which is more comparable to the R-CPI-E to adjust non-senior household income. The revised estimates do not materially change our conclusion. Using these CPI price indices, the median senior household income rises seven times faster than the median among non-senior households.

As a further check on the robustness of our findings, we examined data from the CPS over the same period.[19] The results of this examination are reported in detail in the appendix. The CPS data strongly confirm the SCF findings. The time series patterns of both seniors and non-senior median income in the two surveys track each other well. Over the entire period, CPS median senior household income rose by 74 percent, only slightly less than the 85 percent increase in the SCF. Median non-senior household income rose by only 26 percent, slightly more than the 23 percent in the SCF median. In the CPS, the three-fold increase in senior income relative to non-senior income occurs during the latter half of the period covered by our analysis. But the point in time at which relative senior income begins to grow occurs somewhat later than in the SCF, around 2007.

The CPS robustness check bolsters our confidence in the validity of the SCF income trends. We should also note that the similarity in senior income trends between the two surveys should bolster researchers' confidence in the CPS as a reliable source for measuring long-term income trends of this demographic group. Although underreporting of "irregular" sources of senior incomes remains a concern, it does not appear to materially affect long-term senior income trends.

2.1 Household Size and Tax Adjustments

The aforementioned comparisons between senior and non-senior incomes do not account for several factors that differentially affect living standards of the two groups. This includes household size, the number of children in the household, tax burdens, medical needs, the receipt of in-kind transfers, and employer-provided fringe benefits.[20] Assessing the full impact of these factors

[19] The comparison is based on similarly defined households. As we noted earlier, our analysis of SCF household income is based on PEU income rather than a more inclusive income measure which includes the income of non-financially interdependent members. To make our income comparisons, we adopted the same household concept in the CPS. Our measure of CPS household income includes only that of the head and spouse. Differences between the two household income measures is more fully discussed in Cogan and Heil (2022).

[20] A useful taxonomy of factors that differentially affect living standards between seniors and non-seniors is provided by Mulligan and Sala-i-Martin (2004). For two important early studies that correct for these factors, see Danziger, et al. (1984) and Hurd (1990). Estimates from the 2018 Consumer Expenditure Survey show that health expenditures among senior consumer units accounted for 13 percent of senior income and only 5 percent of non-senior income.

is beyond this paper's scope, but we do provide an indication of the importance of two factors: household size and federal income and payroll taxes.[21]

On average, senior households are about 40 percent smaller than non-senior households over the years covered by the SCF data.[22] To adjust for this difference, we use the method developed by the U.S. Census Bureau in constructing its supplemental poverty measure.[23]

In general, senior household income is subject to lower taxes than non-senior household income. Over 80 percent of all non-senior household income consists of labor earnings (including self-employment income), which is generally subject to both income and payroll taxes. In contrast, only about 25 percent of senior household income consists of employment income. More than one-third of senior household income is from Social Security benefits, dividends, and capital gains. Only a portion of Social Security benefits are subject to federal income taxes. Dividends and capital gains are often taxed at lower rates than ordinary income.[24]

Table 3. Ratio of senior and non-senior median incomes with tax and size adjustments

	SCF	CPS
Pre-tax median	71%	62%
Post-tax median	79%	68%
Adjustment for HH size and taxes	99%	86%

Notes: Data from 2019 SCF and 2019 CPS. Household size adjustment follows U.S. Census Bureau method.

Table 3 reports the median senior household income relative to the non-senior household median income in 2018 before and after adjustments for household size and taxes. The household definition used for these calculations differs slightly from the PEU definition used for our analysis of intertemporal income changes. It includes all household members and their incomes in measuring household size and income. Before adjusting for household size, the median SCF senior household income is 71 percent of the non-senior median (compared to 74 percent using the PEU definition). Accounting for taxes raises this number to 79 percent. Further adjusting household income for

[21] We use NBER's TAXSIM for the tax estimates. Our analysis excludes the effect of state taxes because the SCF public use files do not identify respondents' states.

[22] From 1982 to 2018, senior household sizes grew slightly relative to non-seniors. In 1982, non-senior households had an average of 2.9 members while senior households had 1.7 members. In 2018, non-senior households had 2.7 members and seniors had 1.8 members.

[23] To check the sensitivity of the result, we also adjusted household income using two other equivalence scales commonly used in the economics literature: the square root method, used for certain purposes by the Congressional Budget Office, and a method developed by David Betson and Robert Michael (1993). Using the square root, senior household income was 95 percent of non-senior household income. Using the Betson-Michael method, it was 103 percent.

[24] From 1985 to 2002, dividends were taxed at ordinary tax rates.

household size, raises the SCF senior median income to parity with the non-senior median. Statistical tests of differences between the medians adjusted for household size and taxes in each survey year revealed that, prior to 2012, the non-senior median was statistically higher than the senior median. From 2012 forward in time, the difference is not statistically significant. Thus, from a statistical standpoint, income parity between seniors and non-seniors was reached more than a decade ago according to the SCF.[25]

2.2 Senior Income Growth by Income Group

The rapid growth in senior income is broad-based. Table 4 displays senior median income and its growth relative to non-senior income among various demographic groups from 1982 to 2018. The absolute growth is strong across all household types, age groups, and education levels. Married couples enjoyed a substantial 108 percent increase. Female headed households were not far behind with an 81 percent increase.

Table 4. Real growth in median income from 1982 to 2018

	Seniors	Non-seniors
Marital status		
Married	108%	49%
Single Female	81%	21%
Single Male	68%	5%
Age		
Under 65	--	23%
65-69	43%	--
70-74	108%	--
75 and older	146%	--
Education		
High school or less	47%	5%
Some college	27%	1%
Bachelors or higher	58%	20%

Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index.

The income growth among all three age groups of seniors is also substantial. The magnitude of the increase rises with age, more than doubling among households headed by persons age 75 or older. The larger growth among the latter households is not due to the fact that its starting base is

[25] The CPS data show only a slightly less compelling picture. The amount by which non-senior income exceeds senior income is statistically significant, but not large. After adjusting for household size and taxes, the median senior income ranges between 82 and 88 percent of the non-senior median, depending on the equivalence scale used.

lower. The absolute dollar increase is also larger among these older senior households than it is among younger seniors.

The growth in incomes by education level is also strong. Senior households headed by college graduates registered the largest increase among the three education groups. But the 47 percent growth among households headed by seniors with only high school education or less is still substantial. The increases within each education group are less than the 85 percent increase in the median income among all senior households. This reflects the important role that rising levels of educational attainment among seniors plays in their household income growth. A rough estimate of education's role can be obtained by calculating the proportion of the actual income increase that would have occurred if, within each education category, incomes had remained at their 1982 level. According to this calculation, about 54 percent of the increase in senior household income can be explained by rising levels of educational attainment.[26]

The contrast between the income growth among seniors and non-seniors in each of the various demographic groups is striking. Income growth among senior households dwarfs the growth among non-senior households across household types and education levels.

Table 5. Income at various percentiles for seniors and non-seniors (2020 dollars)

	25th percentile		Median		75th percentile	
	Seniors	Non-Seniors	Seniors	Non-Seniors	Seniors	Non-Seniors
1982	$13,300	$29,400	$25,500	$51,700	$46,200	$82,400
2018	$25,700	$33,200	$47,000	$63,700	$89,300	$117,900
1982 to 2018 Growth	94%	13%	85%	23%	93%	43%

Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index.

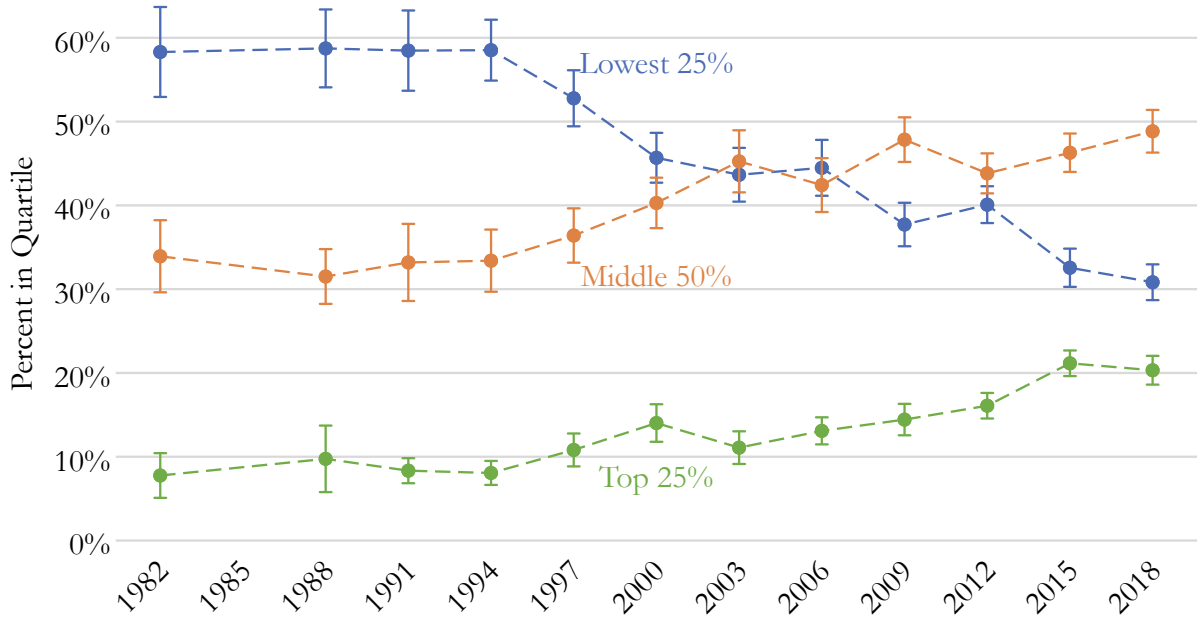
The substantial absolute and relative growth of senior income has also been widespread across the income distribution. Table 5 shows income levels of senior and non-senior households at various income percentiles of their respective income distributions. As we noted earlier, the median income of all senior households grew by 85 percent, or about four times faster than the growth among non-senior households between 1982 and 2018. The absolute and relative growth in senior income is even larger among lower-income senior households. Senior households with incomes at the 25th percentile rose by 94 percent while income among non-seniors at the same percentile rose

[26] The 54 percent estimate uses mean income levels.

by only 13 percent. Senior households with income at the 75th percentile rose by 93 percent, more than twice as fast as the growth among non-seniors at the same percentile.

The broad-based and substantial income growth among seniors coupled with the modest income growth among lower- and middle-income non-senior households has produced a significant convergence in the income distributions between the two age groups. Figure 2 shows the share of seniors with incomes that would place them in the lowest 25 percent, the middle 50 percent, and the highest 25 percent of the non-senior income distribution.

Figure 2. Share of senior households by non-senior quartiles (SCF)



Notes: Data are from SCF. Bars reflect the 95 percent confidence interval.

The movement of seniors up the income distribution is evident from Figure 2. The proportion of seniors with incomes that places them among the poorest 25 percent of non-senior households has declined precipitously over time. Meanwhile, the proportion of senior households with incomes that place them in the middle 50 percent and the richest 25 percent of non-seniors has increased sharply. The convergence in income distributions appears to have begun in the early 2000s and to have accelerated later in the decade.

Over the entire 36 years covered by our analysis, the magnitude of the convergence is striking. For example, in 1982, seniors were more than twice as likely as non-seniors to have incomes that place them in the lowest income quartile. In 2018, seniors were only slightly overrepresented in the lowest quartile.

The movement of the poorest seniors has been largely into the middle class. Since 2009, at least 40 percent of seniors have had incomes that place them in the middle 50 percent of all non-seniors. If the middle of the non-senior income distribution constitutes America's middle class, then most seniors are now solidly members of the middle class and have been so for nearly a decade. Rising senior incomes have also increased the proportion of seniors who enjoy the status of living among the richest 25 percent of the non-senior population. In 2018, the likelihood that a senior household would have an income that places it among the richest 25 percent of non-seniors was over twice as high as it was in 1982.[27]

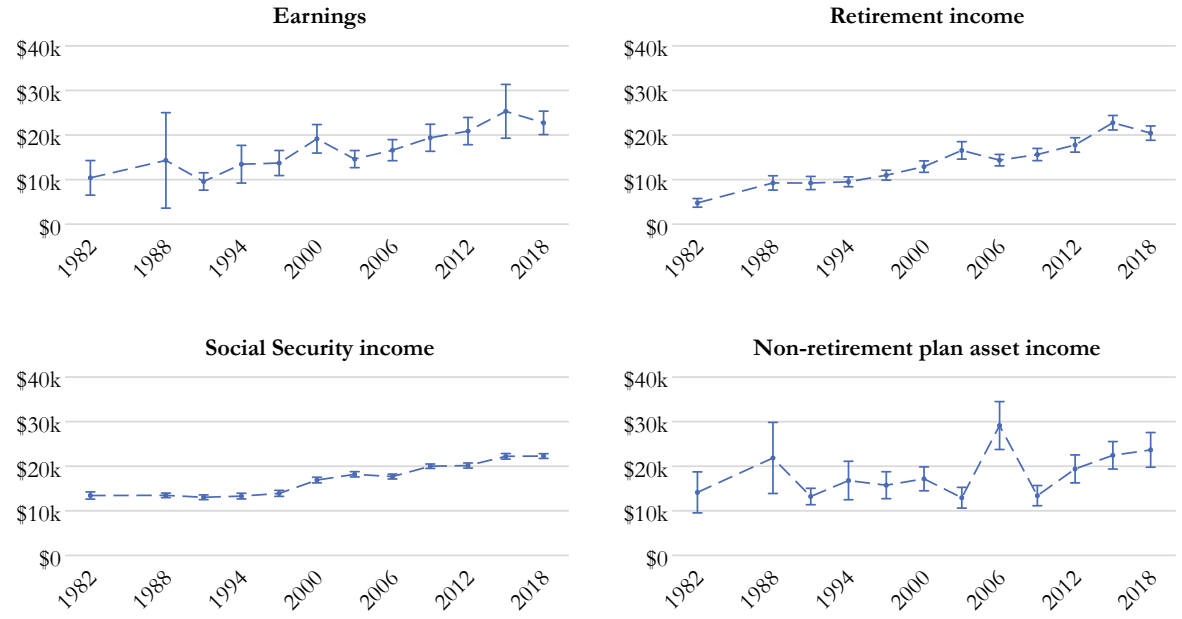
3 Sources of Income Growth Among Seniors

This section examines the sources of senior household income growth. Specifically, we examine the effects on income of changes in retirement plan income, labor earnings, Social Security benefits, and income from assets held outside of tax-preferred retirement plans, termed "non-retirement plan asset income." Together, these sources account for virtually all senior income in most SCF survey years.[28] To obtain an accounting of the importance of each source, the analysis uses mean income, as opposed to median income, as its measuring rod. Our analysis begins with a high-level discussion of the importance of each source among all senior households. We then divide senior households into those with incomes below and above the median senior household income and discuss at a high level the differences in the sources of senior household income growth between the two groups. The SCF's modest sample sizes do not permit a finer breakdown. We conclude this section with a more detailed discussion of each individual income source.

[27] The CPS data exhibit the same trends, but the degree of convergence over time between the income distributions is less pronounced (see appendix). The percentage of seniors with incomes that put them among the poorest 25 percent of non-seniors has declined from 58 percent in 1982 to 35 percent in 2018. The percentage of seniors with middle-class incomes rises from 37 percent to 46 percent over the same period. The 46 percent is just short of the 50 percent required to achieve parity with non-seniors. The share of seniors who become members of the richest 25 percent increases from 5 percent to 19 percent.

[28] The omitted sources of income include government benefits other than Social Security and alimony and income and losses from miscellaneous sources. In 1991, the excluded sources account for 10 percent of total income. In all other years, these sources account for less than 4 percent of total income.

Figure 3. Sources of income among all seniors (2020 dollars)



Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Bars reflect the 95 percent confidence interval.

Figure 3 shows the major sources of senior household income over time. Table 6 provides various summary statistics on each source's growth and its contribution to growth in senior household income. Mean senior household income increased 112 percent between 1982 and 2018, somewhat higher than the 85 percent median income increase. All four major income sources played important roles in this growth. Income from private retirement plans more than quadrupled during the 36-year period and accounted for about one-third of the increase in total household income. Labor earnings doubled and accounted for one-fourth of the income increase. Income from Social Security rose by 66 percent and accounted for nearly one-sixth of the total increase.[29] Income from investments held outside of retirement plans grew by 67 percent and accounted for 20 percent of the increase. Retirement plan income and income from assets held outside of retirement plans are two highly substitutable methods of saving for retirement, distinguished primarily by their tax treatment. Taken together, these two savings vehicles account for over half of the rise in senior household income.[30]

[29] This increase in the average benefit level is slightly higher than expected from Social Security Administration average wage index, which shows a 54 percent increase over the same period (using the PCE price index). We discuss the reason for this apparent discrepancy below.

[30] The CPS data for 1982 to 2018 tell a similar story with one major difference. As in the SCF, retirement plan income more than tripled and labor earnings increased by 228 percent. Social Security benefits increased by 45 percent. These increases were offset by a reduction in non-retirement investment income. Because of the reduction, retirement plan

Table 6. Sources of income among all seniors (2020 dollars)

	Mean income	Earnings	Social Security	Retirement	Investment
Share of income					
1982	--	24%	31%	11%	33%
1997	--	25%	25%	20%	28%
2018	--	25%	24%	22%	26%
Growth rate					
1982 to 1997	28%	32%	4%	132%	11%
1997 to 2018	66%	66%	60%	86%	50%
1982 to 2018	112%	119%	66%	332%	67%
Contribution to income growth					
1982 to 1997	--	28%	4%	52%	13%
1997 to 2018	--	25%	23%	26%	22%
1982 to 2018	--	25%	18%	32%	20%

Notes: Data are from SCF. Median income is inflation-adjusted using the PCE price index.

Earlier, we noted that senior household income grew more rapidly during the latter half of the period covered by our analysis than during the first half. Since SCF data is available only at three-year intervals, the precise point in time when the more rapid rise starts is unclear, but it appears to be between 1997 and 2003. As shown in Table 6, the more rapid growth in household income from 1997 to 2018 is not due to a single source. Instead, all major sources play significant roles. Three of the four major income sources grew more rapidly from 1997 to 2018 than from 1982 to 1997. The fourth, income from retirement plans, grew faster in the first period. Each source contributed 20 percent or more to the total income increase from 1997 to 2018.

The changes in the sources of income have altered the composition of senior household income. In 1982, retirement plan income was a relatively unimportant source of senior household income, contributing only 11 percent to the total. Income from non-retirement plan assets and Social Security were the two most important sources. By 2018, retirement plan income accounted for 22 percent of the total and ranked as a near equal among the four major income sources in contributing to senior household income.

income and labor earnings play a much larger role in the CPS in contributing to the growth in senior household income. Together they account for 81 percent of the growth. The reduction non-retirement plan income is, however, likely a consequence of the CPS's well-known inability to capture irregular income. This is discussed in more detail in section 2.2.

To examine the sources of income changes among seniors at different income levels, Table 7 divides the senior household population into those in the lower and upper halves of the senior income distribution. The level and composition of income of between the two income groups differ markedly. Lower-income senior households rely heavily on Social Security. In 1982, it accounted for 73 percent of their income. The remainder was spread over the three other major categories. Among upper-income households that same year, income from non-retirement plan assets and labor earnings were the dominant income source, accounting for nearly two-thirds of their income. Social Security provided under one-fourth of their income. Income from retirement plans in 1982 was relatively unimportant for both income groups, contributing only 8 percent to total income for lower-income households and 11 percent for upper-income households.

Table 7. Sources of income among seniors by income level

Lower half					
	Mean income	Earnings	Social Security	Retirement	Investment
1982	$14,400	$700	$10,500	$1,200	$1,200
2018	$26,200	$2,600	$16,600	$5,000	$700
1982 Share	--	5%	73%	8%	8%
2018 Share	--	10%	63%	19%	2%
Growth Rate	82%	298%	58%	314%	-45%
Contribution to income growth	--	17%	51%	32%	-4%
Upper half					
	Mean income	Earnings	Social Security	Retirement	Investment
1982	$72,300	$20,100	$16,400	$8,300	$27,100
2018	$157,400	$42,800	$28,000	$35,800	$46,600
1982 Share	--	28%	23%	11%	37%
2018 Share	--	27%	18%	23%	30%
Growth Rate	118%	113%	71%	334%	72%
Contribution to income growth	--	27%	14%	32%	23%

Notes: Data are from SCF. Median income is inflation-adjusted to 2020 dollars using the PCE price index. Income distribution is limited to households with senior heads.

Labor earnings and retirement plan income were the fastest growing income sources for both lower- and upper-income households from 1982 to 2018. Among lower-income households, labor earnings and retirement plan income quadrupled. Among upper-income households retirement plan income more than quadrupled and labor earnings doubled. Social Security income also grew

substantially and slightly faster among upper-income households. The growth in non-retirement plan asset income differed sharply between the two income groups, declining by 45 percent among lower-income households and rising by 72 percent among upper-income households.

Largely because of the significant differences in the composition of income between the two groups, the contributions of each source to the increase in household income over time differs between them. Social Security is the dominant source of income growth among lower-income households, accounting for 51 percent of their total income increase. Among upper-income households, Social Security contributed an unimportant 14 percent. Because of its strong growth, retirement plan income accounted for about one-third of the household income increase among lower- and upper-income households. Likewise, the strong growth in labor earnings contributed another one-sixth to the income of lower-income households and over a quarter to the income of upper-income households.

To better understand the growth in each income source, we now examine each source individually.

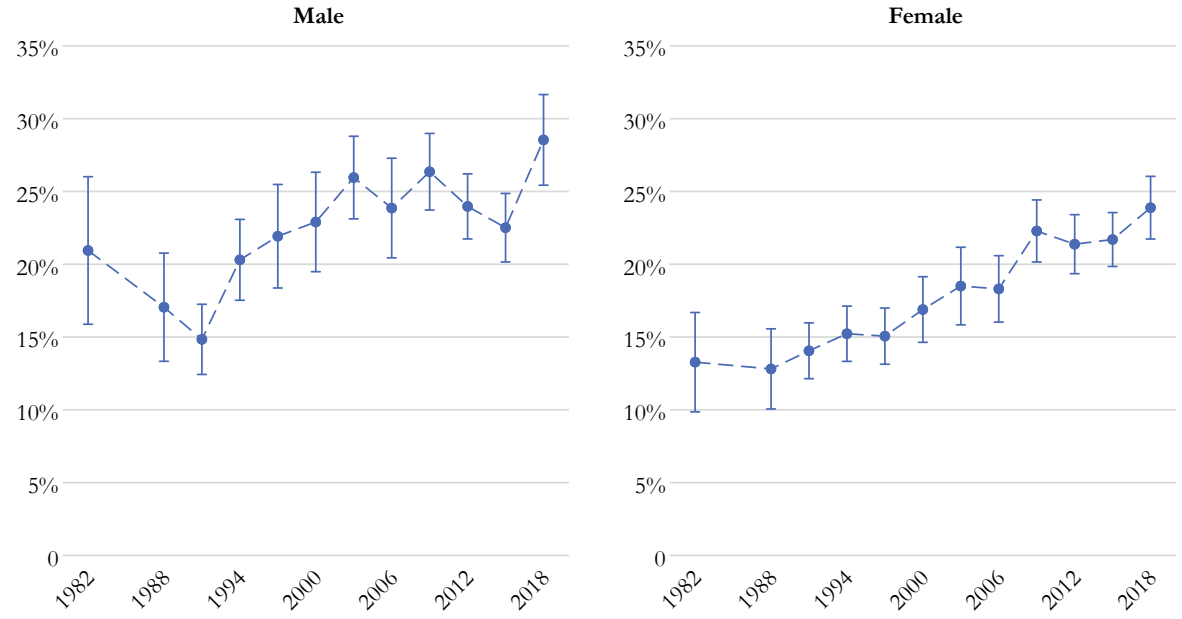
3.1 Income Growth: Labor Earnings

As noted in Table 6, the near doubling of senior household labor income accounts for 25 percent of the growth in senior household income from 1982 to 2018. This growth is due to both rising real wages and employment rates.

Figure 4 shows senior male and female employment-to-population ratios.[31] The employment ratios of both males and females exhibit an upward trend, starting in the late 1980s or early 1990s. Over the entire period, the growth in employment ratios is substantial, rising by 36 percent among senior males and 80 percent among senior females. The large employment increases are also broad-based, occurring among virtually all household types, education levels, and age groups.[32] The employment growth among senior males since the mid-1990s stands in sharp contrast to the flat employment ratio among non-senior males over the same period.[33] The increase in the senior female employment ratio, measured in percentage point terms, is similar to the increase among non-senior females (a gain of 11 percentage points for seniors versus 12 percentage points for non-seniors).

[31] Employment is defined as whether the person worked at all during the year.
[32] The only exception are single males with some college but no degree.
[33] The employment rate among non-senior males in the SCF was 85 percent in 1982 and 2018.

Figure 4. Employment rates by sex in senior households



Notes: Data are from SCF. Employment rates are for household head and spouse (if present).

The rise in employment among seniors since the mid-1990s represents a remarkable change in trend from prior decades. Prior to the mid-1990s, the senior male employment ratio had been declining for a century or longer (Costa 1998). The senior female employment ratio, after rising following World War II at a slow rate, began to decline in the late 1950s. Its slow decline continued until the late 1980s when it renewed its upward path.

The trend reversals have been well-documented in the labor economics literature and by studies of senior income (Purcell 2009, Poterba 2014). The phenomenon among males is not confined to the United States. Recent NBER research has shown that it is present in most developed countries.[34] Explanations for the trends for either males or females have, however, proven elusive. The pre-2000s labor economics literature, written at a time when employment ratios of senior men were declining and those of senior women were either flat or declining, emphasized rising wealth retirement levels, including wealth from Social Security and private pension plans, as the driving force behind the long-term employment decline among senior men and the failure of senior women's employment to rise (Costa 1998, Haber and Gratton 1994, Hurd 1990). Since then, wealth among seniors has continued to rise and, presumably, continued to exert its downward influence on labor force participation among seniors. The more recent labor economics literature

[34] See Coile, Milligan, and Wise (2018)

has focused on the impact of factors working in the opposite direction to increase employment. These include higher education levels, improvements in health and longevity, changes in the composition of jobs, and improved work incentives due to the shift in private retirement plans from defined benefit to defined contribution plans, policy changes in Social Security, and complementarity between the leisure times in married couple households.[35] Although research has documented the importance of each of these factors individually on seniors' employment, none of them can explain the trend reversal among either males or females.

Figure 5. Median weekly wages by sex in senior households (SCF)

Notes: Data are from SCF. Wages are inflation-adjusted using the PCE price index. Data includes household head and spouse (if present).

The strong employment gains are matched by large real wage increases among both senior males and females. Figure 5 reports median weekly wages among working seniors from the SCF data.[36] The median senior male wage more than doubled and the median senior female wage rose by 53 percent from 1982 to 2018. The median wage among senior males increased 12 times faster than the median wage of non-senior males. Conversely, the median wage of females in senior households

[35] For an excellent summary of the empirical evidence of each of these factors, see Coile (2019).
[36] In 1982 there are only 79 observations on male workers and only twice that number in 1988. Similarly, there are only 39 observations on working females in 1982, and only 58 in 1988. The number of observations somewhat larger in the 1990s. The average numbers of male and female workers in the three 1990s surveys are 227 and 78. Median rather than mean wages are shown because among males the yearly means are heavily influenced by outliers causing average fluctuations of 23 percent from one survey year to the next. Female mean wages do not exhibit similar annual fluctuations. From 1982 to 2018, they increase by 68 percent.

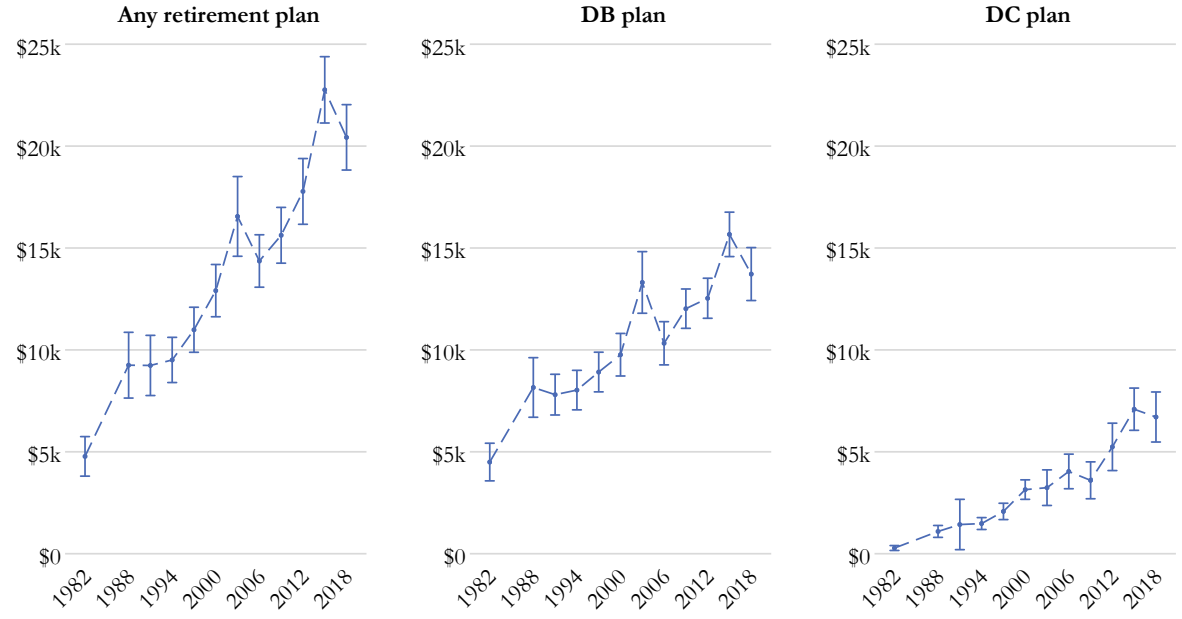
has grown less than the median among non-senior females. The number of SCF observations on working senior males and females, however, is small, especially in the 1980s. Thus, the confidence intervals in Figure 5 are wide and provide good reasons for caution in interpreting these trends.

The CPS, with its large number of observations, serves as a check on both the employment and wage trends identified in the SCF. The CPS data, discussed in the appendix, support the same conclusion of strong employment and wage growth among both senior males and females. According to the CPS, employment ratios rose by 14 percent for males and 62 percent for females from 1982 to 2018, slightly lower than in the SCF. The CPS median weekly wages of males in senior households rose by 151 percent and the median female wage in senior households rose by 128 percent (using a three-year average centered on the middle year).

3.2 Income Growth: Retirement Income

Income from retirement plans is the fastest rising and the largest contributor to senior household income growth. As Figure 6 shows, both defined benefit and defined contribution plans contributed substantially to the more than four-fold increase in retirement plan income between 1982 to 2018. Although income from defined contribution plans is a rapidly growing share of the total, income from defined benefit remains the primary source of retirement plan income, accounting for two-thirds of the total in 2018.

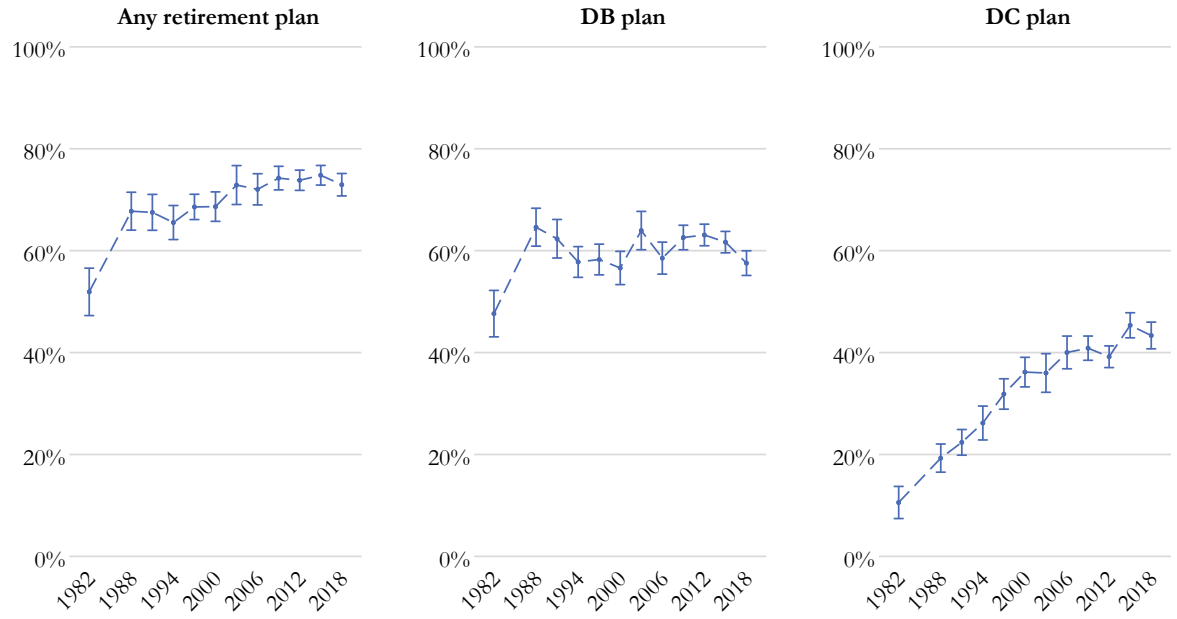
Figure 6. Senior retirement plan income by type (2020 dollars)



Notes: Data are from SCF. Defined contribution plan includes IRA withdrawals. Bars reflect the 95 percent confidence interval.

Figure 7 shows the substantial increase in the share of senior households with at least one member enrolled in a retirement plan. The percentage rose from 52 percent in 1982 to 74 percent in 2009, when it reached a plateau.[37] The enrollment increase is due to the rapid rise in defined contribution plan enrollment. As noted earlier, 401k plans were in their infancy in 1982 and IRAs were only 7 years old. In that year, only 11 percent of seniors were enrolled in either type of defined contribution plan. Enrollees in employer-sponsored plans were mainly participants in 403b, 457b and Keogh plans. Since then, participation among seniors in defined contribution plans has quadrupled. Meanwhile, enrollment among seniors in defined benefit plans ceased growing in 1989. Since 2009, the enrollment growth in defined contribution plans, which has slowed considerably, has offset the slight decline in defined benefit plan enrollment.

Figure 7. Retirement plan participation rates in senior households



Notes: Data are from SCF. Defined contribution plan includes IRA withdrawals. Bars reflect the 95 percent confidence interval.

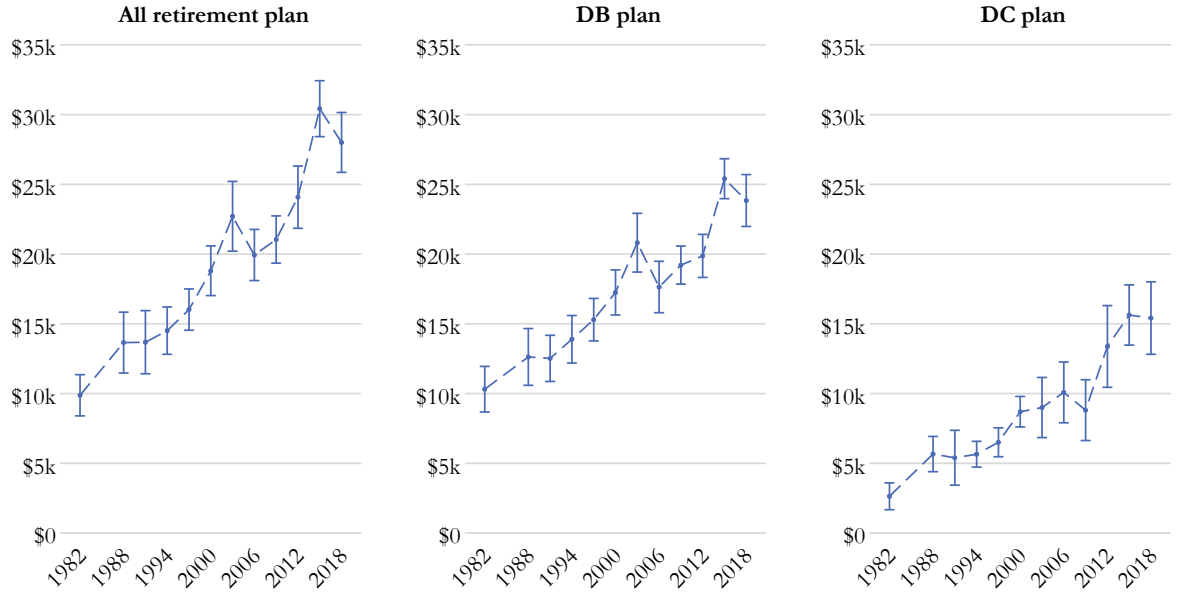
The increasing prevalence of defined contribution plans among seniors reflects a well-documented shift among employers away from defined benefit plans toward defined contribution

[37] Households are defined as retirement plan participants if either the household head or spouse, in the case of married couples, reports that he or she is currently covered by an employer sponsored plan or report having assets in a plan, and persons who report having assets in an IRA. IRAs and employer sponsored defined contribution plans are combined because persons who are no longer working or have left employment in which they were enrolled in a defined contribution plan often rollover their defined contribution balances into an IRA. There is a timing difference between retirement plan income and enrollment in the SCF. Income, as we noted earlier, refers to income during the prior year. Enrollment in retirement plans and household assets are, on the other hand, recorded as of the date of the survey.

plans. The shift began almost immediately after Congress authorized 401k plans. Rising administrative costs of defined benefit plans due to government regulations appear to have played a major role in the shift, particularly among small firms.[38] The portability and greater flexibility at retirement age of defined contribution plans also appears to be important.[39] Evidence is mixed on the importance of the economy-wide shift away from largely unionized manufacturing firms, which traditionally have offered defined benefit plans.[40] Whatever the underlying reason, the trend toward greater reliance on defined contribution plans is likely to continue well into the future.

Rising participation rates in retirement plans explain 38 percent of the growth in senior retirement income. The remaining share is driven by an increase in defined benefit plan pension payments and defined contribution plan withdrawals among plan participants. Figure 8 reports mean retirement plan income of all retirement plan participants, those enrolled in defined benefit plans, and those enrolled in defined contribution plans. The time series patterns are similar to the retirement plan income increases among all seniors shown in Figure 6 and reveal the strong growth in income from both types of retirement plans and the continuing importance of defined benefit plans as an income source for seniors.

Figure 8. Retirement plan income among senior participant households

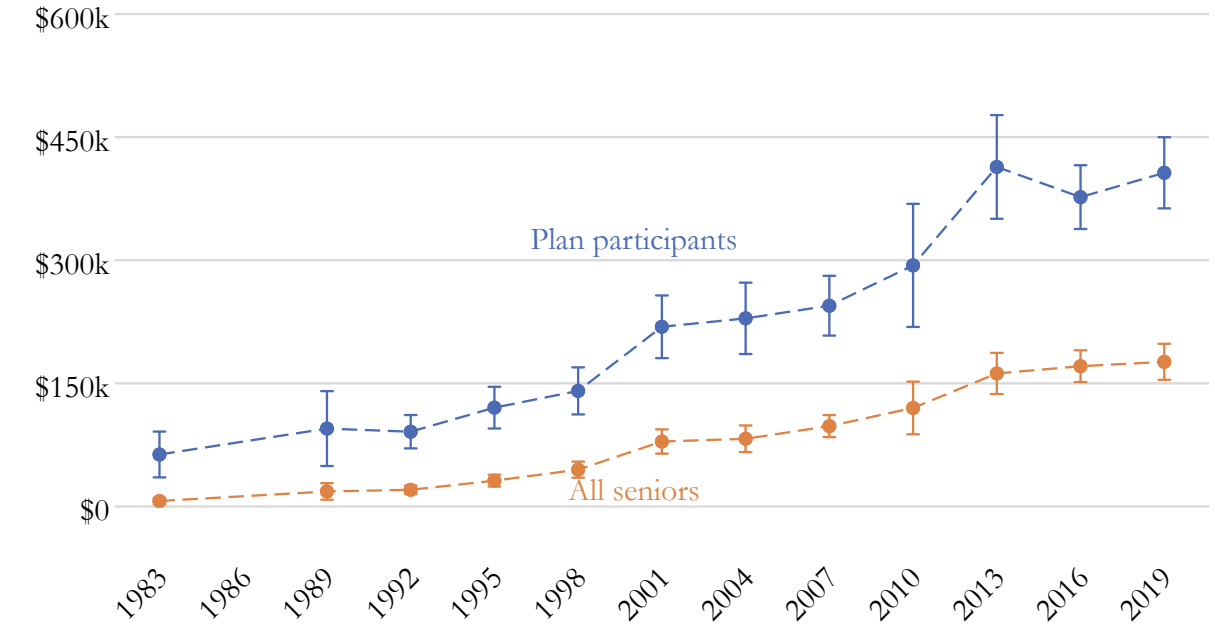


Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Defined contribution plan includes IRA withdrawals. Bars reflect t
percent confidence interval.

[38] Chang (1991), Clark and McDermed (1990), and Ippolito (2005).
[39] Ippolito (2005) and Poterba, Rauh, Venti, and Wise (2009).
[40] Gustman and Steinmeier (2001) and Ippolito (2005)

Asset balances in defined contribution plans provide another dimension to the substantial growth in defined contribution plans among seniors. Figure 9 shows mean asset balances of all senior households and asset balances among the sub-set of senior households that are plan participants. Both data series show substantial growth in retirement plan assets throughout the 36-year period covered by the data. In 2019, the average defined contribution plan balance among all senior household plan participants was 26 times its level in 1983.[41] Among plan participants, it was 6 times the 1982 level. In contrast to the growth in defined contribution plan participation which began to slow in the mid-to late-2000s, asset balances continue to register strong growth since then.

Figure 9. Mean DC assets among participating seniors (2020 Dollars)



Notes: Data are from SCF. Assets are inflation-adjusted using the PCE price index. Defined contribution plan includes IRAs.

Two major financial contractions during the years covered by our analysis appear to have only temporarily slowed the growth in retirement plan assets. Assets flattened from 2001 to 2004, reflecting the temporary decline in equity values following the collapse of the high-tech bubble in 2000. The timing of the SCF surveys at three-year intervals spans the point at which asset values collapsed during the Great Recession of 2008-2010. Nevertheless, any reductions in defined contribution asset balances which occurred during the Great Recession recovered to their 2007 level by 2010.

[41] The SCF records asset balances at the time of the survey.

Defined contribution asset balances have become an increasingly important component of total household net wealth, constituting about 16 percent of net wealth in 2019 compared to just 2 percent in 1983. Among plan participants, defined contribution assets is an even more important, constituting 21 percent of net wealth in 2019 compared to just 7 percent in 1983.

3.3 Income Growth: Non-Retirement Plan Asset Income

Income from assets held outside of retirement plans consists of interest income, dividends, income from rents and royalties, and realized capital gains. Earlier in Table 6, we reported that senior household income from these assets grew by 67 percent from 1982-2018. Table 8 reports detailed income data by the type of asset income. The top bank of numbers reports the share of senior households that receive income from any of the four asset categories and from each asset type individually. The percentage of households that received any income from these assets declined substantially between 1982 and 2018. The reduction is due entirely to a sizeable decline in the percentage that received interest income. The percentage of households that received dividend income and income from rental properties or royalties has remained roughly constant over the period covered by the data. The proportion of households receiving capital gains income shows a substantial increase, but the year-to-year fluctuations in the proportions are large and too volatile to draw any firm conclusions about trend.

Table 8. Non-retirement investment income by type among senior households

	All sources	Interest	Dividends	Rental	Realized Capital Gains
Share receiving					
1982	65%	59%	20%	14%	5%
2018	40%	23%	20%	14%	12%
Mean among recipients					
1982	$21,800	$11,600	$12,500	$14,600	$52,700
2018	$59,800	$13,300	$19,400	$65,200	$66,600
Growth rates (1982 to 2018)					
All seniors	67%	-55%	57%	330%	187%
Among recipients	174%	15%	55%	347%	26%

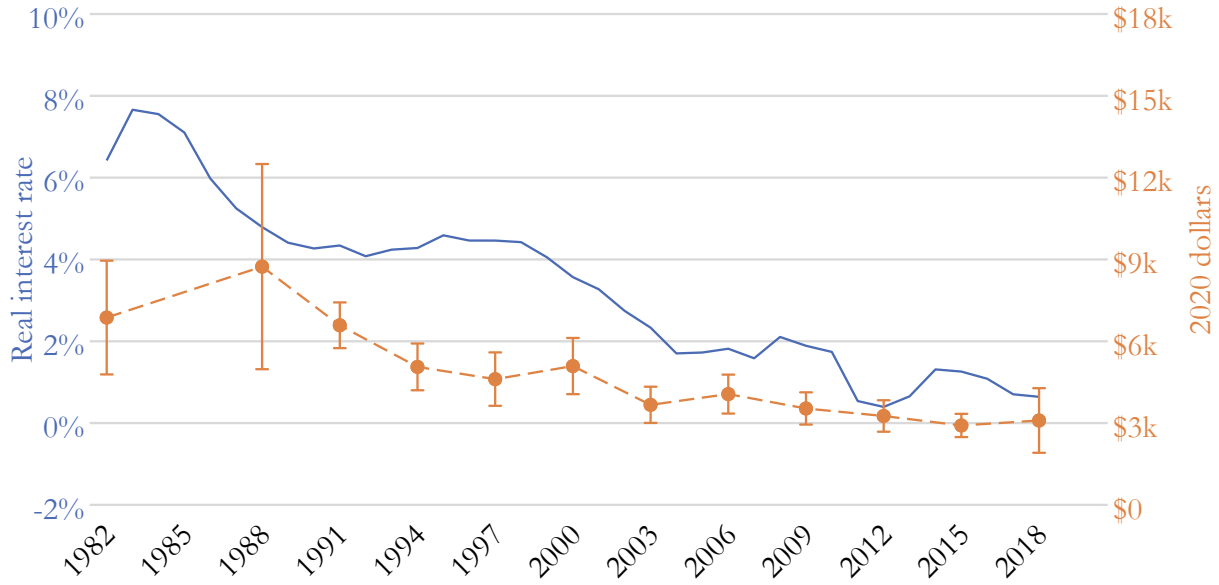
Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Mean calculation is limited to households with non-zero values. Rental income includes income from trusts and royalties.

The second bank of numbers in Table 8 reports the mean amount of income received from all non-retirement plan assets taken together and the mean amount received from each asset type

individually. Both are conditional on the household receiving income from each asset type. Income from all non-retirement plan assets increased by 174 percent among recipient households. The increase is mainly due to a large increase in income from rental properties and, secondarily, capital gains realizations. The increase in total non-retirement plan income among recipient households more than offset the reduction in the percentage of households which received income from this source. In combination, these changes produce the 67 percent increase in non-retirement asset income among all senior households reported in Table 6.

The substantial decline in the share of households receiving interest income is particularly noteworthy. This decline, coupled with only a small change in the average amount of interest income among households that receive interest income, produced a 60 percent reduction in the average amount of interest income among all households. This indicates a sizeable reduction in the extent to which seniors rely on interest income. In 1982, interest income accounted for 16 percent of retiree income. In 2018, it accounted for only 3 percent.

Figure 10. Real interest rates and mean interest income among seniors



Notes: Income data are from SCF. Interest income is inflation-adjusted using the PCE price index and includes only income from assets held outside o retirement plans. The real interest rate is equal to the three-year rolling average (centered on the middle year) of the average nominal interest rate of 10-year treasury bonds minus the annual growth in the PCE price index.

Although some of this reduction is likely to be the result of a shift of interest-bearing assets into retirement plans, a larger portion is due to changes in interest rates over time. As shown in Figure 10, real interest rates underwent a large decline from historic highs in the 1980s to historic

lows during and after the Great Recession. The decline in interest rates coincides with the steep drop in interest income among senior households.[42]

The creation of IRAs and 401k plan led naturally to questions among policymakers and economists about whether the growth in their assets was the result of an increase in household savings or merely a shift from other forms of (taxable) savings to these tax-deferred savings vehicles. This question produced a rich literature on household savings behavior. The general conclusion from this research is that, while there is evidence of some shift of savings into IRAs and 401k plans, these savings vehicles have contributed to an increase in total household savings.[43]

3.4 Income Growth: Social Security Income

In Table 6, we reported that average inflation-adjusted Social Security income among senior households increased by 66 percent from 1982 to 2018. Since the share of households that receive Social Security benefits is roughly the same in 2018 as it was in 1982, the mean benefit level among recipients rose by a similar amount (67 percent). While not out of line with the increase contemplated by the 1977 Social Security law that established the modern monthly benefit schedule, the increase is higher. That law was designed to ensure that initial Social Security benefits payable at the program's normal retirement age would increase over time with the growth in worker earnings. From 1982 to 2018, the Social Security Administration's wage index, rose by 54 percent. There are many reasons why the relationship between the growth in mean household benefits and Social Security's wage-indexed earnings is only an approximate one. Changes over time in household composition, the age composition of recipients, the age at which seniors choose to retire, and changes in Social Security benefit rules all affect the relationship between the two.

Nevertheless, it is worthwhile to provide a partial reason for the relatively larger increase in benefits. Toward this end, Table 9 reports recipiency rates and the average Social Security income amount among recipients by household type and, among married couple households, average benefits of household heads and spouses. The left-hand columns show that the percent of married couple heads and heads of single female households that received Social Security benefits is unchanged from 1982 to 2018. The average benefit levels of heads of both types of households,

[42] The inflation-adjusted rate is calculated as the difference between the average nominal interest rate on 10-year Treasury bonds in each year and the growth in the yearly growth in the PCE price index. To smooth the trend, we use a three-year rolling average.

[43] See for example, Venti and Wise (1987), Poterba, Venti, and Wise (1995), and Poterba, Venti, and Wise (1998).

shown in the right-hand side columns, increase at about the same rate as Social Security's average wage index.

Table 9. Social Security participation and benefits among senior households (2020 dollars)

	Participation rate		Mean benefit among recipients		Mean benefit growth
	1982	2018	1982	2018	
Married couples	93%	92%	$18,000	$31,000	78%
Head	90%	89%	$12,300	$20,000	62%
Spouse	72%	75%	$5,600	$11,800	109%
Single female	91%	92%	$11,000	$17,100	57%
Single male	95%	88%	$12,600	$18,600	47%

Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Mean benefit is limited to members with positive Social Security income.

Meanwhile, the percentage of spouses (who are almost entirely female) increases by 4 percent, from 72 percent in 1982 to 75 percent in 2018. Their average benefit level doubles over the same period. These increases account for all of the higher growth in the average benefit of married couples relative to that of households headed by single persons. The larger increase among married couples, who constitute about half of all senior households, also accounts for larger increase the average household Social Security benefit among all households relative to the Social Security wage index.

4 A Backward Glance at Price-Indexing

During the 1970s Social Security debates and in the years since, Congress has considered various proposals to price index, rather than wage index, Social Security initial benefits. These proposals share a common goal of ensuring that initial Social Security benefits received by typical retirees in future years are at least as high in real terms as the initial benefit received by the typical new retiree in a base year. Since consumer prices typically rise more slowly than wages, price-indexed initial benefits usually rise more slowly over time than wage-indexed initial benefits. This slower growth allows Social Security benefits to be financed with lower payroll taxes.

This section considers how Social Security benefits, senior household incomes, and the Social Security Trust Fund's financial status would have been affected had Congress adopted a price-indexing approach rather than wage-indexing in 1977. The price-indexing analysis is designed to illustrate the quantitative impact of a price-index policy relative to the wage-indexing policy and should not be regarded as our preferred policy. The form of price indexing we examine is one of the

three methods proposed by the President's Commission to Strengthen Social Security.[44] The Commission's so-called "Model 2" plan was designed to hold the inflation-adjusted value of initial benefits in any given year that are payable at Social Security's normal retirement age to those payable in a base year.[45] In computing a worker's initial benefits, the Commission's plan retained the wage-indexing approach, but applied an adjustment that removed the increase in initial benefits that was due to real wage growth since the base year, leaving only the increase due to prices.[46] The Commission's approach did not alter the distribution of Social Security benefits from the distribution produced by wage indexing. It thereby isolated the impact that price versus wage indexing would have on benefit levels and allowed the Commission to address any distributional changes it was contemplating to be addressed separately.

The price-indexing policy considered here, like the wage-indexing policy enacted by Congress in 1977, begins with workers who reach Social Security's full retirement age of 65 in 1982. Our policy sets initial benefits for these workers at approximately the same levels as those payable under Congress' wage-indexing formula.[47] Initial benefits for workers reaching Social Security's full retirement age in each year thereafter are determined by the Commission's price-indexing method, which uses the CPI-W to index benefits to prices. Benefits of workers who reach the program's full retirement age prior to 1982 are not affected by the policy. Figure 11 illustrates the policy's effect on initial benefits of "typical" workers who turn age 65 in 1982 and later years. Typical workers are defined as those who have annual earnings equal to the average wage index in each year of their

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[44] The Commission's plan differed from the Hsiao Committee's plan, which was the chief price-indexing alternative to wage indexing at the time the 1977 law was debated. The Hsiao committee's plan used the growth in the consumer price index, instead of economy-wide wages, to update a worker's past earnings to obtain the worker's average monthly indexed earnings. Similarly, the CPI was used to update the bend points in the Social Security benefit formula to arrive at a worker's primary insurance amount. Under this method, the inflation-adjusted value of initial benefits would increase over time along with real wages increases. But they would increase at a slower rate than under wage indexing. Also, this method would reduce both Social Security replacement rates and the degree of progressivity in its benefits over time.

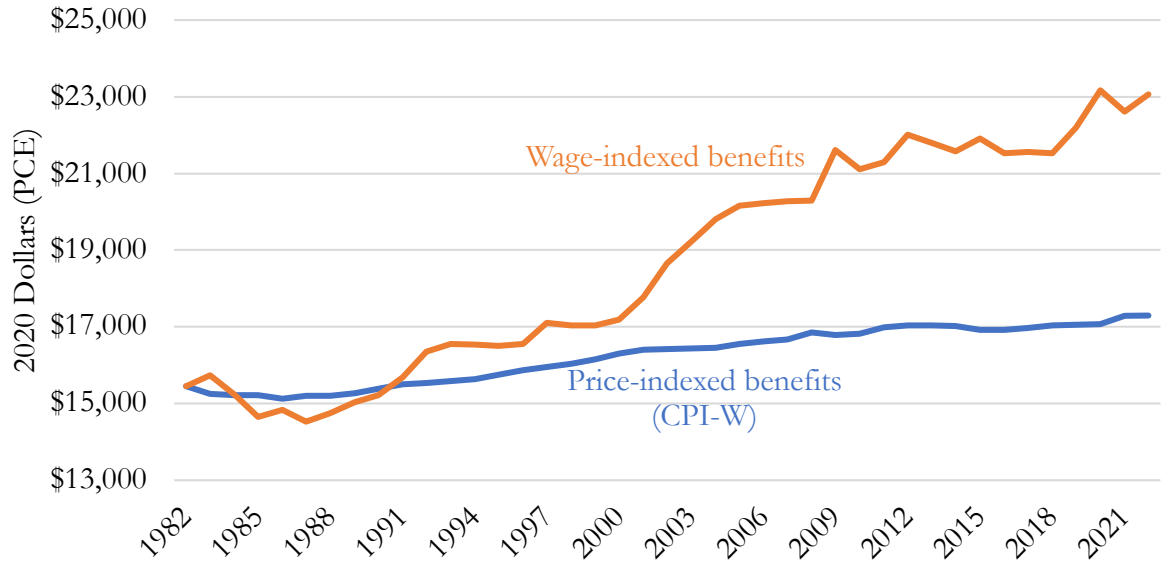
[45] Specifically, the adjustment yields the same real benefits over time to individuals with the same wage-indexed earnings history.

[46] Technically, the price-indexed initial benefit in any year is obtained by multiplying the wage-indexed benefit by the ratio of the growth in prices (using the CPI-W) relative to wages from the base year to the year in question. President's Commission to Strengthen Social Security (2001), page 120.

[47] The price indexing policy differs in one respect than the actual wage-indexing policy. The latter contained a five-year transition period that allowed workers born between 1917 and 1922 to receive the higher of their wage-indexed benefit or the benefit they would have received under the prior law after a modest downward adjustment. Most Social Security recipients who received higher benefits under the transition provisions than they would have received under wage-indexing, were those born 1917 and, therefore reached Social Security's normal retirement age in 1982, the first year of our SCF data series. By 1988, the second year of our SCF data series, few recipients did so. For example, 40 percent of recipients who turned age 65 in 1982 received the higher transitional benefit. By 1988, only 2 percent of recipients who were born in 1921 received transitional benefits. Our policy assumes that benefit levels for persons who reached age 65 between 1982 and 1987 were determined by the wage-indexing formula. Thus, for a small portion of senior households, our approach overstates the actual benefit change.

career.[48] Initial wage-indexed benefits, shown by the orange line, increase from one year to the next by a lagged increase in the Social Security Administration's National Average Wage Index.[49] Initial price-indexed benefits are shown by the blue line. Importantly, because the CPI-W tends to grow faster than PCE price index, price-indexed benefits would still have risen in real dollars when using the PCE price index to account for inflation.

Figure 11. Initial SS benefits with wage and price indexing



Notes: Initial benefits are set at the normal retirement age. Price-indexed benefits grow with the CPI-W, but prices are indexed to the PCE price indexed.

Over most of the period covered by our analysis, price-indexed initial benefits would have been less than wage-indexed benefits, and this difference would have grown over time. This would be expected since, as we noted earlier, wages normally grow faster than prices. However, during the late 1970s and early 1980s the reverse was true. Unusual economic conditions, which often occur during economic recessions, caused prices to grow faster than wages for four consecutive years from 1979 to 1982. Starting in 1983, the relationship between price and wage growth returned to normal with wage growth exceeding price growth. But because the impact of price indexing in any given year depends on the cumulative growth in prices relative to wages from the base year to that year, price-indexed initial Social Security benefits would have been higher than wage-indexed benefits

[48] Our definition of the "typical" worker is different than a worker with "scaled medium earnings" in Social Security Trustees Report (2021), table V.C7. The Trustees' scaled medium earnings creates a stylized earnings history that reflects actual Social Security data. See Clingman and Burkhaltar (2022) for more details.
[49] The earnings and national wage data are obtained from the Social Security Trustees Report (2021), table V.C7.

until 1990.[50] Thereafter, initial benefits for the typical new retiree would have been lower under the price-indexing approach. For example, initial benefits would have been only 6 percent lower for the typical worker who reached Social Security's full retirement age in 1998, 17 percent lower for the typical worker who reached that age in 2008, and 21 percent lower for the typical worker who reached that age in 2018.

Determining how price indexing would have affected mean Social Security benefits levels and household income among all senior households requires calculating initial benefits under price indexing for Social Security recipients in the SCF. The SCF identifies whether each survey respondent and spouse received Social Security benefits at the time of the survey, each recipient's age, and the number of years that each recipient has been receiving Social Security benefits. Information on an individual's age allows for the determination of whether the person would have been affected by price indexing or would have been grandfathered under the prior law. The information on age and how long the recipient was receiving Social Security benefits allows determination of whether each recipient retired at Social Security's normal retirement age, chose early retirement benefits, or opted to retire later and received delayed retirement credits.

We used this information and the Social Security benefit formulas to estimate each recipient's initial wage-indexed Social Security benefit, i.e., the benefit to which the individual was entitled at Social Security's full retirement age. Each recipient's price-indexed benefit was obtained by adjusting the recipient's wage-indexed initial benefit by the cumulative growth in prices, as measured by the CPI-W, relative to the cumulative growth in Social Security's national average wage index from 1977 to the year in which the recipient reached age 60.[51]

4.1 Impact on Benefits

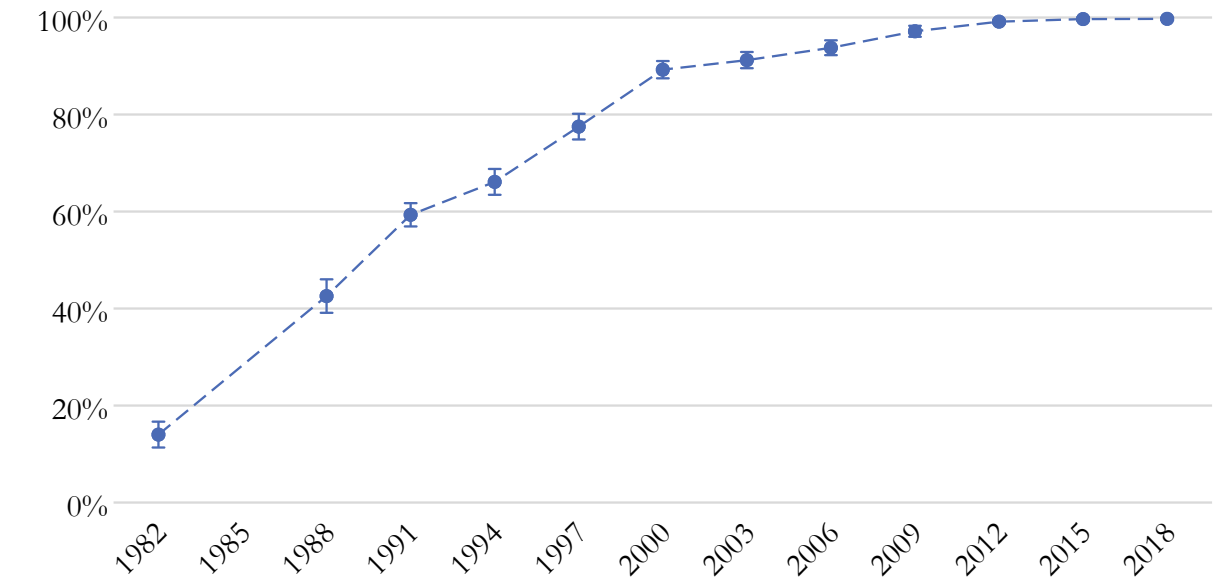
Figures 12 and 13 show how price indexing would have affected senior household Social Security income in each year relative to the current law's wage-indexing policy. Figure 12 shows the proportion of senior households in which the head or the spouse's benefits would have been impacted by our price-indexing policy. The proportion is small in 1982 because the policy would

[50] The length of time between when wages began to grow faster than prices and when initial benefits began to be larger than price-indexed benefits warrants and explanation. Under wage-indexing, earnings up to age 60 are included in a worker's AIME, unless the workers unindexed earnings after age 60 and prior to receiving Social Security would increase the worker's AIME. Our example assumes away any post-age 60 earnings. Thus, workers who reached Social Security's full retirement age in 1982 would have an AIME based on the national average wage index up to 1977. Workers who reached the program's full retirement age in 1992 would have an AIME based on the national average wage index up to 1987.

[51] If respondents reported enrolling in Social Security prior to age 60 (typically DI recipients), we use the ratio of price growth to wage growth from 1977 to two years before their reported enrollment year.

only affect persons who reached age 65 in 1982 or later and thus consists of households with members who chose early retirement benefits. The proportion impacted by the policy grows rapidly to 42 percent of senior households in which either the head or spouse was receiving Social Security by 1988 and around 90 percent or higher by 2003.[52] The policy would have impacted virtually all senior households that were receiving Social Security from 2012 forward in time.

Figure 12. Share of senior household SS recipients affected by price-indexing

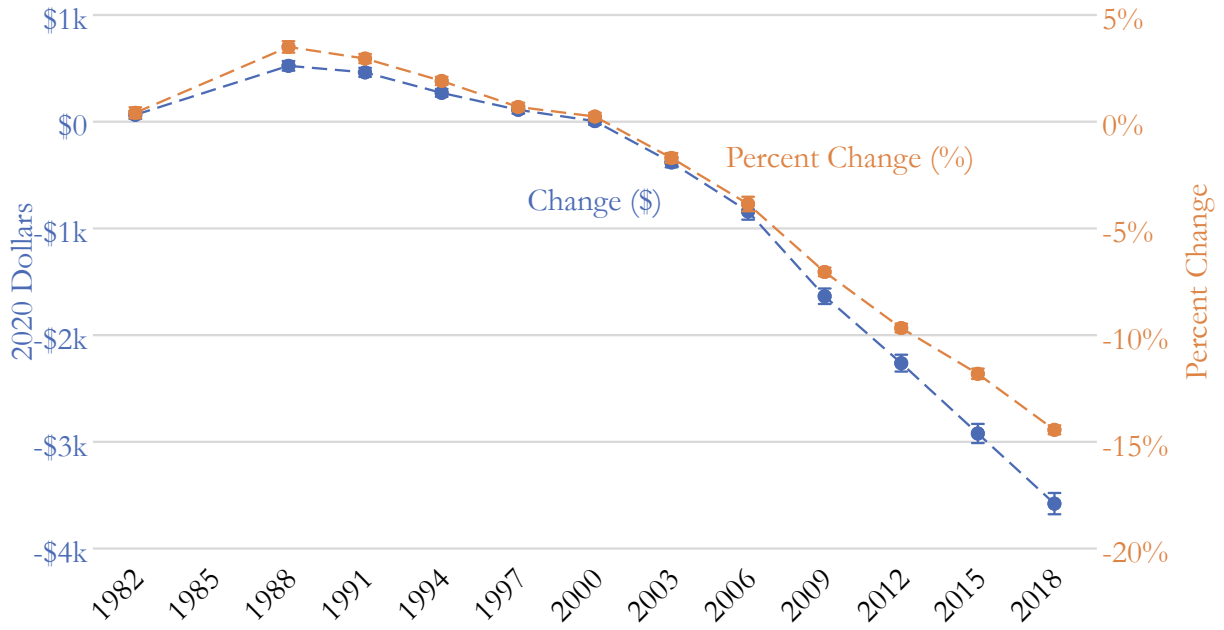


Notes: Data are from SCF. Bars reflect the 95 percent confidence interval.

Figure 13 shows the effect price indexing would have had on the Social Security benefits among senior households whose benefits were impacted by the policy. The blue line shows the change in average benefits in dollar terms and the orange line shows the percent change from the benefits actually received. The average affected senior would have experienced slightly higher benefits through 2000. This result reflects the fact that the 2000 senior population includes many recipients who would have benefited from the higher price-indexed benefits during the 1980s. The impact of price indexing prior to the mid-2000s is small, whether measured in dollar terms or as a percent of wage-indexed benefits. Its impact becomes more substantial in 2009, when the average benefit reduction begins to exceed $1,000 annually. By this point in time, over 90 percent of all Social Security recipients would have been affected by the policy, and most of this group would have

retired after the point where price-indexed initial benefits would have been below wage-indexed benefits (in 1991).[53] By 2018, price indexing would have reduced the mean Social Security income among recipient households by 15 percent from its wage-indexed level.

Figure 13. Effect of price-indexing on affected senior households



Notes: Data are from SCF. Price-indexing change affects recipients turning 65 in 1982 or later. Bars reflect the 95 percent confidence interval.

4.2 Impact on Senior Household Income

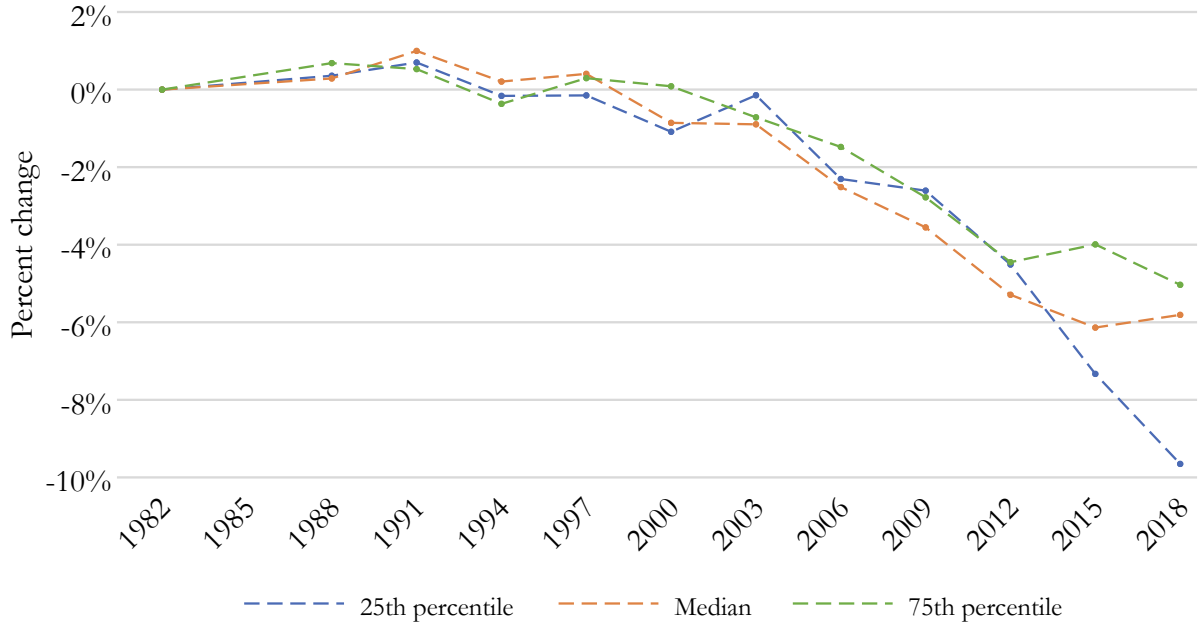
The impact that price indexing would have had on senior household income is shown in Figure 14. The effect would have been negligible across the income distribution up to at least 2003. Even after 2003, the policy would have reduced median senior household income by only 6 percent in any year. The impact of price indexing on the income of lower- and upper-income senior households is similar to the median.[54] The policy would not have materially affected median income of lower-income senior households (i.e. the 25th percentile) until the middle of the last decade. By 2018, its impact would have risen to a 10 percent reduction. The policy's impact on the median income of upper-income senior households (i.e. the 75th percentile) is also small until the middle of

[53] The average benefit changes reported in Figure 13 reflect a mixture of households, some which receive higher benefits from price indexing, some which receive lower benefit, and others whose benefits are not affected by the price-indexing policy because they had not reached age 65 by 1982. The benefit increases among households which are positively affected by the price-indexing policy is small. In most years, the increase is 4 percent and reaches 5 percent only in 1994. The benefit reductions among households adversely affected by the price-indexing policy ranges from 0 percent to 4 percent in the years prior to 2003.

[54] The impact of price-indexing on the proportionate change in Social Security benefits does not vary by the size of Social Security benefits. All initial benefit levels are adjusted by the growth in prices relative to the growth in wages.

the last decade. The policy would have reduced the median income among upper-income senior households by only 5 percent in 2018. The smaller percentage impact on upper-income compared to lower-income households is due to differences in Social Security's share of household income between the two groups. Recall that Social Security accounted for only about 20 percent of household income among upper-income households in any year. Among lower-income households, it accounted for 73 percent of household income in 1982 and 63 percent in 2018.

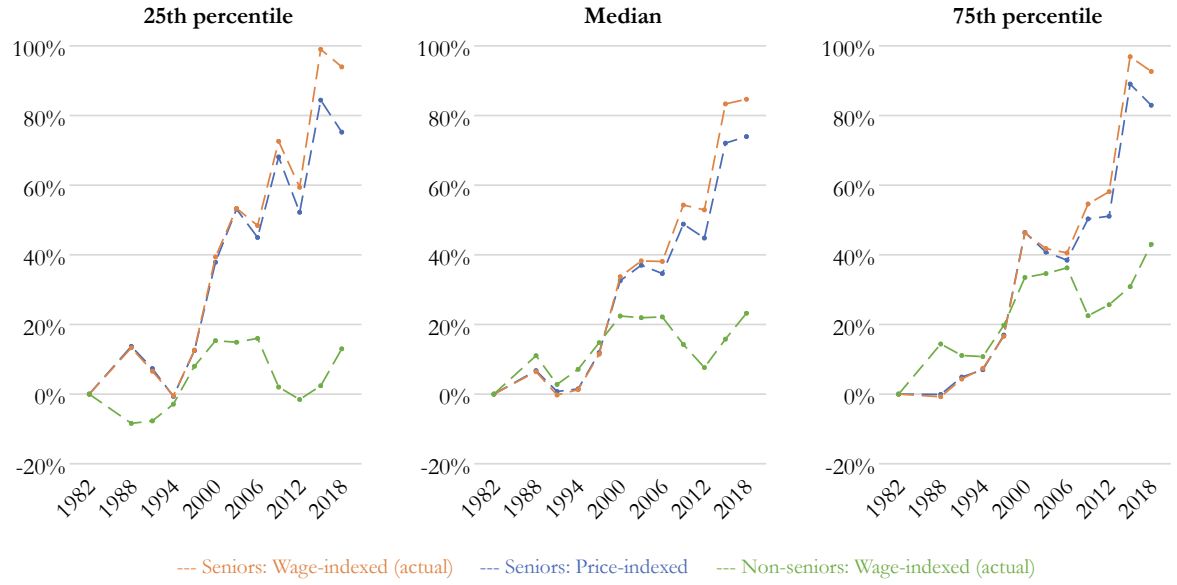
Figure 14. Percent change in senior household income with price-indexing policy



Notes: Data are from SCF. Bars reflect the 95 percent confidence interval.

The reduction in incomes from the price-indexing policy would have only modestly altered the substantial growth in senior household income. Figure 15 shows the growth in senior incomes across the income distribution under the wage- and price-indexing policies. The median would have increased by 74 percent from 1982 to 2018, down only slightly from its actual 85 percent increase. The median among lower-income households would have also risen by 75 percent from 1982 to 2018. The upper-income median would have risen by 83 percent over the same period. These increases are far larger than the 23 percent increase in the median income of all non-senior households.

Figure 15. Real growth in household income under wage- and price-indexed SS benefits



Notes: Data are from SCF. Data are inflation-adjusted using the PCE price index. Bars reflect the 95 percent confidence interval.

4.3 Impact on Trust Fund

During the Social Security debates of the 1970s, experts warned that a wage-indexing policy was not sustainable. If adopted, they argued, wage indexing would put Social Security on a path to insolvency. As the baby-boom generation reached retirement age, the growth in the number of Social Security recipients would outstrip the growth in the number of workers. Under such demographic conditions, wage indexing, which held the ratio of benefits to wages constant, would necessarily cause Social Security outlays to rise faster than revenues. The expert predictions proved prescient. In all the annual Social Security Trustees Reports issued since 1985, the trustees have declared that the program's trust fund would be depleted within 75 years. Since 2010, the Social Security trust fund has run annual deficits on a cash basis—by far the longest string of consecutive cash deficits in its history. Annual deficits, including receipts of interest payments from the treasury, are projected to continue without interruption in the future. Unless Social Security taxes are increased or benefits are reduced, the Social Security program is projected to be insolvent in 2035.

Although the effect of price indexing on household income would have been modest, its impact on the Social Security program's financial status and outlook would likely have been substantial because the number of Social Security recipients is large. To calculate its impact, we aggregated the effect price indexing would have on Social Security benefits across all SCF

households (including those currently enrolled in the Social Security Disability Insurance program). We then applied the aggregate reduction in each survey year from 1982 to 2018 to official Social Security outlays and net revenues from the taxation of Social Security benefits. Estimates for the years in between surveys were obtained by linearly extrapolating the results from each pair of adjacent surveys. The estimates were extended to future years to determine the long-term effect of price indexing on the trust fund's solvency.[55]

Figure 16. OASDI cash surpluses under wage- and price-indexing

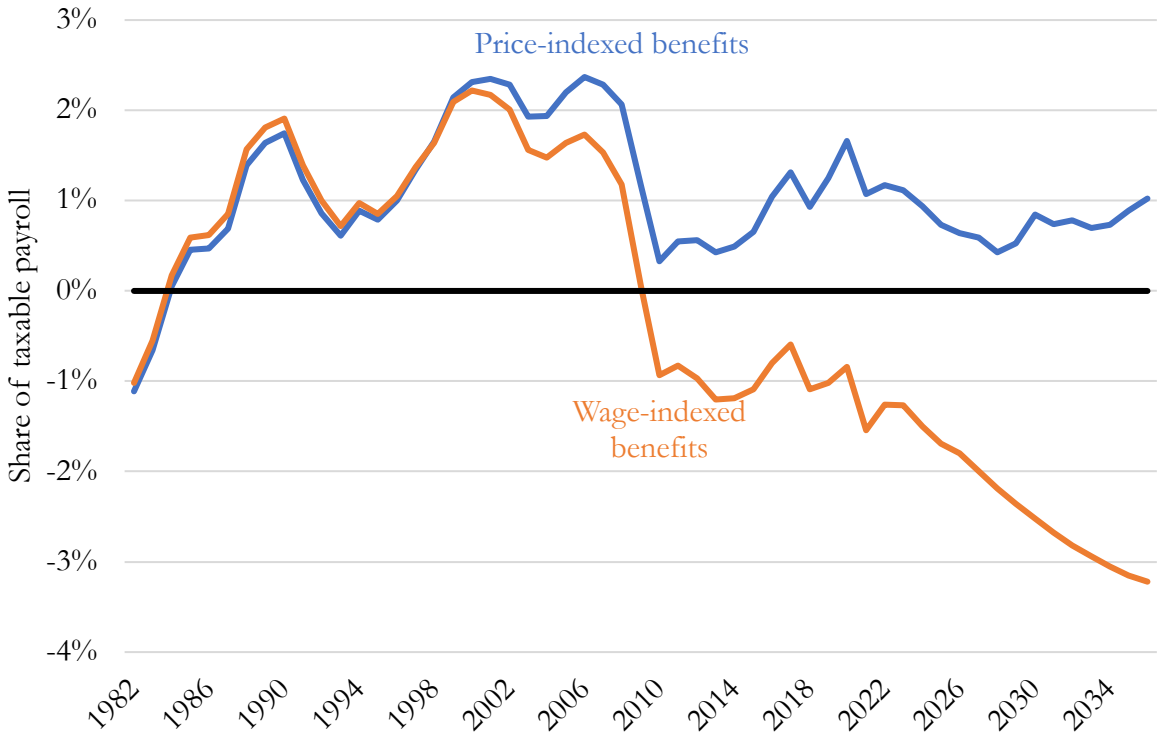


Figure 16 shows how price indexing would have affected the OASDI trust funds' annual surplus as a percent of taxable payroll. As shown, the policy would have had little impact on the aggregate annual surplus until the beginning of the last decade. Each year thereafter, its impact would have been material and would have grown larger over time. Instead of incurring annual cash deficits in each year since 2010 as has been the case with wage indexing, the program would have generated annual tax revenue surpluses. As a result, this year the trust fund balance would have been nearly twice its current level and rising, instead of declining, in future years. The Social Security

[55] For future years, we estimate the projected average age of Social Security recipients among those 62 or older. The reduction in benefits is equal to the ratio of the growth in the CPI-W to average wage index from 1977 to the year the average-aged Social Security recipient would reach age 60. To estimate the average age, we calculate the probability of Social Security enrollment by age and sex using pooled CPS data (from 2017 to 2019). We then use U.S. Census Bureau population projections to estimate the annual Social Security population by age.

trustees would have declared the trust fund to be solvent and Social Security's looming financial crisis would have been averted.

5 Conclusion

The SCF, supplemented by the CPS, paints a clear picture of changes in income among senior households since the early 1980s. Both surveys show a substantial and broad-based growth in senior household income. Both surveys show that this growth has been between three times and four times faster than the increase in income among non-senior households. As a result, the median senior household disposable income, after adjusting for household size, has reached parity or near parity with the median among younger households. Increased retirement plan income, labor earnings from greater employment and higher wages, have been the most important contributors to the growth in senior household incomes. For most seniors, rising Social Security benefits have played only a modest role.

The focus of this paper has been on income as opposed to consumption trends. Consumption, which is in some respects preferable to income as a measure of well-being among seniors, exhibits a similar upward trend both in absolute and relative terms. Consumer Expenditure Survey data from 1984 to 2018 show that real mean expenditures among senior consumer units rose by 71 percent. Non-senior consumer units only experienced an increase of 28 percent over the same period. Like income trends, the increase in consumption is particularly strong among older seniors. From 1984 to 2018, consumer units with respondents age 75 and older experience an inflation-adjusted increase of 84 percent.[56]

The strong growth in senior incomes raises an important consideration for future Social Security policy. During the 1977 Social Security deliberations over wage indexing, there was little consideration of the likely impact of IRAs, which had just been created in 1974. Nor was consideration given to the potential impact 401ks would have upon their adoption in 1978. The lack of consideration is understandable given the uncertainty about how workers and employers would respond to the increased savings incentives created by these retirement vehicles. But in the years since, these vehicles have proven to be an important and growing source of retirement income for all seniors—especially for seniors in the upper half of the income distribution. In conjunction with longer working careers, they have played a crucial role in the remarkable growth of senior household

[56] Recent CEX data are available at https://www.bls.gov/cex/tables.htm. Historical CEX data is available at: https://www.bls.gov/cex/csxstnd.htm.

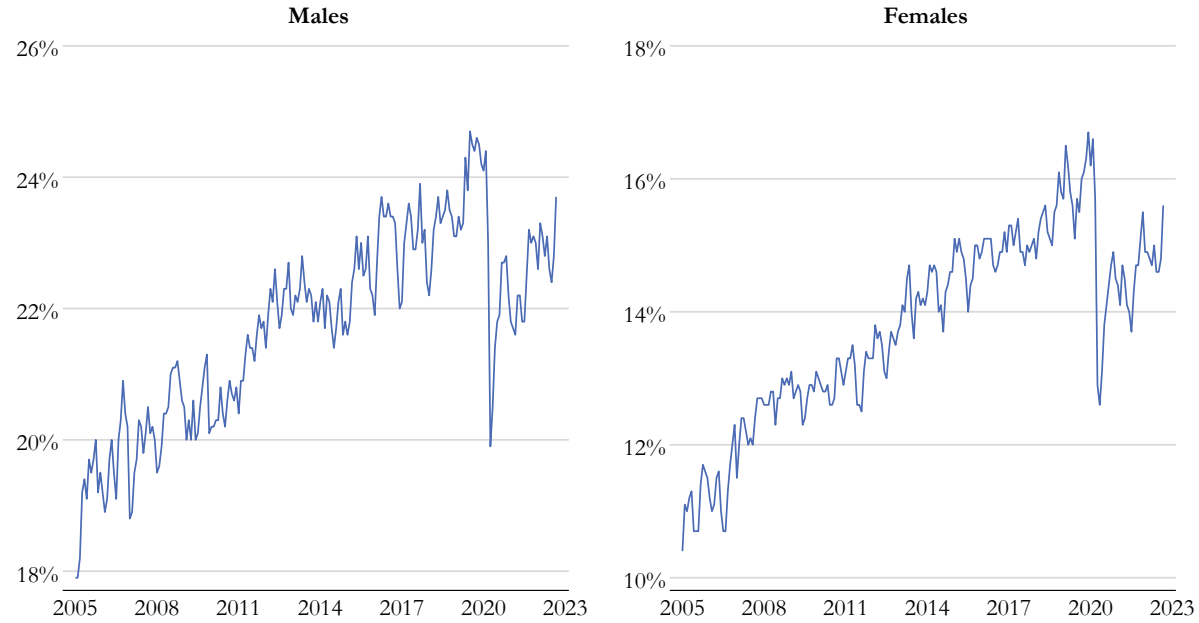
income and have, thereby, lessened the need for reliance on Social Security benefits by a large portion of retirees.

As policy makers consider changes to Social Security to ensure its solvency, our findings indicate that revising Social Security's wage-indexing policy should be a high priority. In retrospect, wage indexing was a major policy mistake. From the policy's implementation to 2018, inflation-adjusted senior household income would have risen in both absolute terms and relative to relative to income of the working age households without indexing initial benefits to wages. Though unnecessary to achieve the program's goal of keeping improvement in senior's livings standards on par with those of non-seniors, wage-indexing put Social Security on a virtual certain path to insolvency. Our findings also suggest that increasing Social Security's degree of progressivity should be a component of any program reform. Changes in labor market behavior and the greater availability of defined contribution retirement plans has allowed all seniors, but particularly middle- and upper-income seniors, to be able to rely less on Social Security for retirement income support.

The main caveat to these policy conclusions revolves around whether the income trends we've documented will continue. Forecasting future income trends is beyond the scope of the paper. But recent employment, retirement plan participation, and wealth data can serve as a leading indicator of the income outlook for future seniors.

The COVID-19 pandemic upended labor markets and may have long-term effects on employment rates among seniors. Employment data, however, suggest that the pandemic's adverse effect on seniors work effort may be temporary. Figure 17 shows the employment-to-population ratios among seniors from 2005 to 2022. The effect of the COVID-19 pandemic is evident for both males and females. The initial pandemic shock caused the employment ratios among both to decline by about 4 percentage points from February 2020 to April 2020. Since then, their employment ratios have risen. As of September 2022, the male employment ratio has regained 84 percent of its reduction and the female employment ratio has regained 73 percent of its reduction. Although no firm conclusions can be drawn from these data, there is little evidence that the pandemic shock has led to either a permanent reduction in employment among seniors, or anything more than a temporary disruption in its growth.

Figure 17. Employment-to-population ratios among seniors



Notes: Data are from the Current Population Survey. Rates are not seasonally adjusted.

Retirement plan participation and asset balances, however, are a different story. Compared to households headed by persons age 65 and older today, enrollment in defined contribution retirement plans and median asset values of households headed by persons who are nearing retirement age, have been no higher at similar stages in their working careers. Also, using the SCF, Gale, et al. (2020) find that median net wealth for those age 55 to 64 declined from 2004 to 2016 while mean net wealth stayed relatively flat; similar trends are observed for those age 45 to 54.

Sources Cited

Bee, Adam and Joshua Mitchell (2017). "Do older Americans have more income than we think?" *SESHD Working Paper #2017-39*. Available at: https://www.census.gov/content/dam/Census/library/working-papers/2017/demo/SEHSD-WP2017-39.pdf.

Beshears, John, James J. Choi, David Laibson and Brigitte C. Madrian (2018). "Household finance," In *Handbook of Behavioral Economics*, B. Douglas Bernheim, Stefano DellaVigna, and David Laibson (eds). Elsevier: 2018. Available at: https://www.hbs.edu/faculty/Pages/item.aspx?num=54725.

Biggs, Andrew G. (2020). "Changes to household retirement savings since 1989," *AEI Economic Perspectives.* Available at https://www.aei.org/wp-content/uploads/2020/05/Changes-to-Household-Retirement-Savings-Since-1989.pdf?x91208.

Betson, David and Robert Michael (1993). "Recommendation for the construction of equivalence scales." Unpublished memorandum prepared for the Panel on Poverty and Family Assistance, committee on National Statistics, National Research Council.

Boskin, Michael J., Ellen L. Dulberger, Robert J. Gordon, Zvi Griliches, and Dale W. Jorgenson (1998). "Consumer prices, the Consumer Price Index, and the cost of living." *Journal of Economic Perspectives* 12(1): 3-26.

Chang, Fwu-Ranq (1990). "Uncertain lifetimes, retirement, and economic welfare," *Economica* 58: 215-32.

Chen, Anqi, Alicia H. Munnell, and Geoffrey T. Sanzenbacher (2018). "How much income do retirees acturally have? Evalualting the evidence from five national datasets," *Center for Retirement Research at Boston College, CRR WP 2018-14*. Available at: https://crr.bc.edu/wp-content/uploads/2018/11/wp_2018-14__.pdf.

Clark, Robert L. and Ann A. McDermed (1990). *The Choice of Pension Plans in a Changing Regulatory Environment.* Washington D.C.: AEI Press.

Clingman, Michael and Kyle Burkhaltar (2022). "Actuarial Note Number 2022.3," *Office of the Chief Actuary, Social Security Administration.* Available at: https://www.ssa.gov/OACT/NOTES/ran3/an2022-3.pdf.

Cogan, John F. and Daniel L. Heil (Forthcoming). "The construction of income data from the Survey of Consumer Finances: 1983 to 2019," Unpublished.

Costa, Dora (1998). *The Evolution of Retirement: An American History, 1880-1990*. Chicago: The University of Chicago Press.

Coile, Courtney (2019). "Working longer in the United States: Trends and explanations," In *Social Security Programs and Retirement around the World: Working Longer*. Courtney C. Coile, Kevin Milligan, and David A. Wise (eds). Chicago: University of Chicago Press.

Coile, Courtney C., Kevin Milligan, and David A. Wise (2018). "Social Security programs and retirement around the world: Working longer – introduction and summary." *NBER Working Paper No. 24584*. Available at: https://www.nber.org/system/files/working_papers/w24584/w24584.pdf.

Congressional Budget Office [CBO] (2019). *The Budget and Economic Outlook: 2019 to 2029*. Available at: https://www.cbo.gov/system/files?file=2019-01/54918-Outlook.pdf.

Czajka, John L. and Gabrielle Denmead (2008). "Income data for policy analysis: A comparative assessment of eight surveys." *Final report.* Washington, DC: Mathematica Policy Research.

Czajka, John L. and Gabrielle Denmead (2011). "What we're missing: How to obtain better estimates of retirement income in our major household surveys." *Paper presented at the Association for Public Policy Analysis and Management Fall Research Conference, November 3-5, 2011, Washington, DC.*

Czajka John L. and Gabrielle Denmead (2012). "Income measurement for the 21st century: Updating the Current Population Survey," *Final Report*. Washington, DC: Mathematica Policy Research.

Danziger, Sheldon, Jacques Van der Gaag, and Eugene Smolensky (1984). "Implications of the relative economic status of the elderly for transfer policy." In *Retirement and Economic Behavior*. Henry J. Aaron and Gary Burtless (eds). Washington, DC: Brookings Institute, 175-96.

Dettling, Lisa J., Sebastian J. Devlin-Foltz, Jacob Krimmel, and Sarah J. Pack (2015). "Comparing micro and macro sources for household accounts in the United States: Evidence from the Survey of Consumer Finances," *Finance and Economic Discussion Series* 86: 1-69.

Gale, William G., Hilary Gelfond, Jason Fichtner, and Benjamin H. Harris (2020). *The Wealth of Generations, with Special Attention to the Millennials*. Washington, DC: The Brookings Institution. Available at: https://www.brookings.edu/wp-content/uploads/2020/05/Generations-Working-Paper-2.pdf

Gale, William G., Swati Joshi, Christopher Pulliam, and John Sabelhaus (2022). *Simulating Income Tax Liabilities in the Survey of Consumer Finances*. Washington, DC: The Brookings Institution.

Gordon, Robert J. (2006). "The Boskin Commission Report: A retrospective one decade later." *NBER Working Paper 12311*. Available at: https://www.nber.org/papers/w12311.

Gustman, Alan L. and Thomas L. Steinmeier (2001). "Retirement and wealth," *NBER Working Paper No. w8229*. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=266199.

Haber, Carole and Brian Gratton (1994). *Old Age and the Search for Security: An American Social History,* Bloomington, Indiana: Indiana University press.

Hurd, Michael D. (1990). "Research on the elderly: Economic status, retirement, and consumption and savings," *Journal of Economic Literature* 28(2): 565-637.

Ippolito, Richard, (2005). "Toward explaining the growth of defined contribution plans," *Industrial Relations* 34(1): 1-20.

Mulligan, Casey B. and Xavier Sala-i-Martin (2004). "Internationally common features of public old-age pensions and their implications for models of the public sector," *Advances in Economic Analysis and Policy* 4(1).

Poterba, James M. (2014). "Retirement security in an aging population," *American Economic Review, Papers and Proceedings*: 1-30.

Poterba, James M., Joshua Rauh, Steven F. Venti, and David A. Wise (2009). "Lifecycle Asset Allocation Strategies and the Distribution of 401(k) Retirement Wealth." In *Developments in the Economics of Aging*. David A. Wise (ed). Chicago: University of Chicago Press: 15-56.

Poterba, James M., Steven Venti, and David Wise (1995). "Do 401k Contributions Crowd Out Other Private Savings," Journal of Public Economics, (58).

Poterba, James M., Steven Venti, and David Wise (1998). "Personal Retirement Savings and Asset Accumulation," In *Frontiers in the Economics of Aging*, David Wise (ed). Chicago: University of Chicago Press.

President's Commission to Strengthen Social Security (2001). *Strengthening Social Security and Creating Personal Wealth for All Americans*. Available at: https://www.ssa.gov/history/reports/pcsss/Final_report.pdf.

Purcell, Patrick J. (2009). "Income of Americans aged 65 and older, 1968 to 2008," *Congressional Research Service, RL33387*.

Schieber, Sylvester J. (1995). "Why do pension benefits seem so small?" *Benefits Quarterly* 11(4): 57–70.

Venti, Steven and David Wise (1987). "IRAs and Retirement Savings," in *Taxes and Capital Formation*, Martin Feldstein (ed), University of Chicago Press.

Woods, John R., (1996). "Pension benefits among the aged: Conflicting measures, unequal distributions." *Social Security Bulletin* 59(3): 3–30.

Appendix A. Non-senior household demographic characteristics

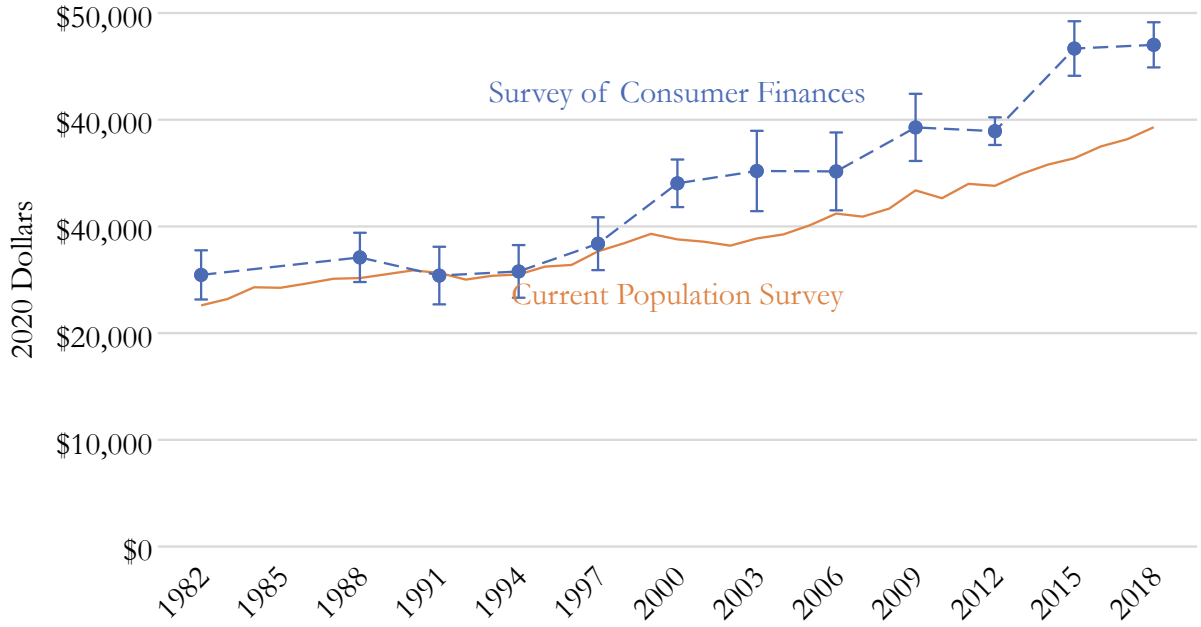
Table A1. Demographic characteristics of non-senior householders

	1982	2018
Marital status		
Married	67%	58%
Single Female	20%	23%
Single Male	12%	18%
Education		
High school or less	55%	37%
Some college	23%	29%
Bachelors or higher	22%	36%

Notes: Data are from SCF.

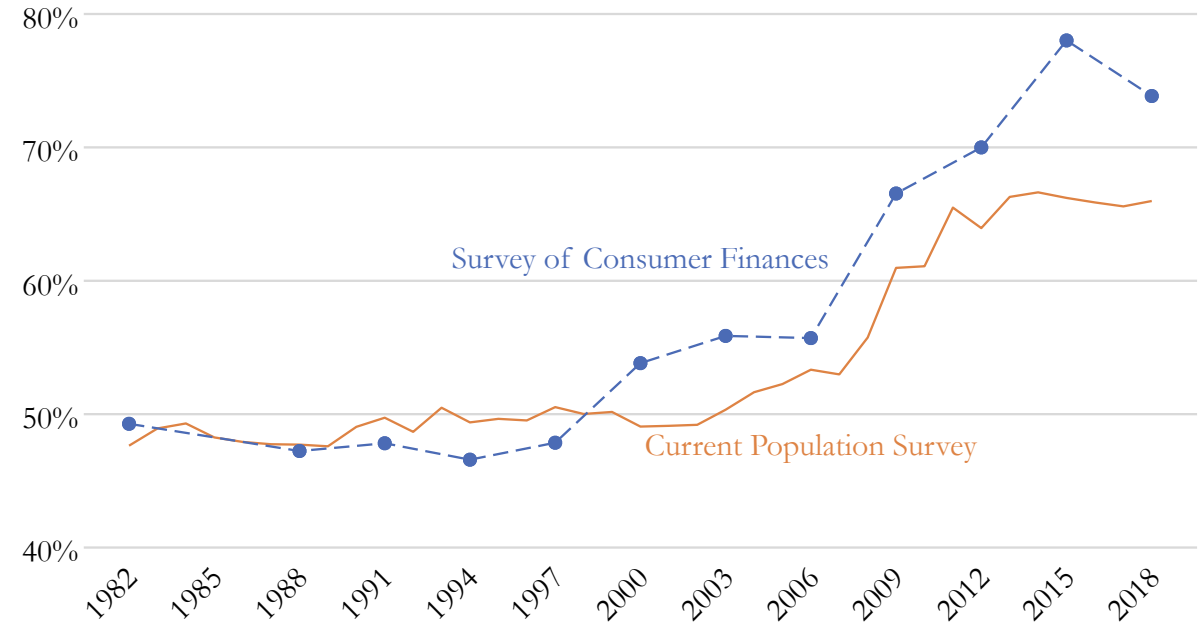
Appendix B. Comparisons to the Current Population Survey

Figure B1. Median income for senior households: SCF vs CPS



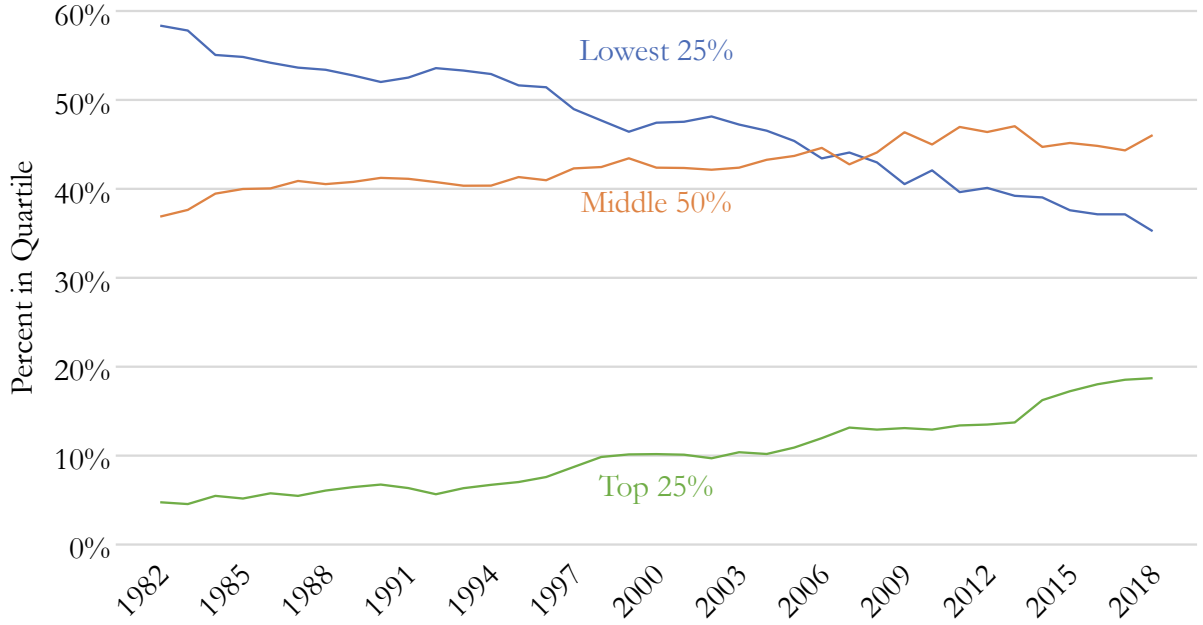
Notes: Income is inflation-adjusted using the PCE price index. Bars reflect the 95 percent confidence interval.

Figure B2. Median senior income relative to non-senior income: CPS vs SCF



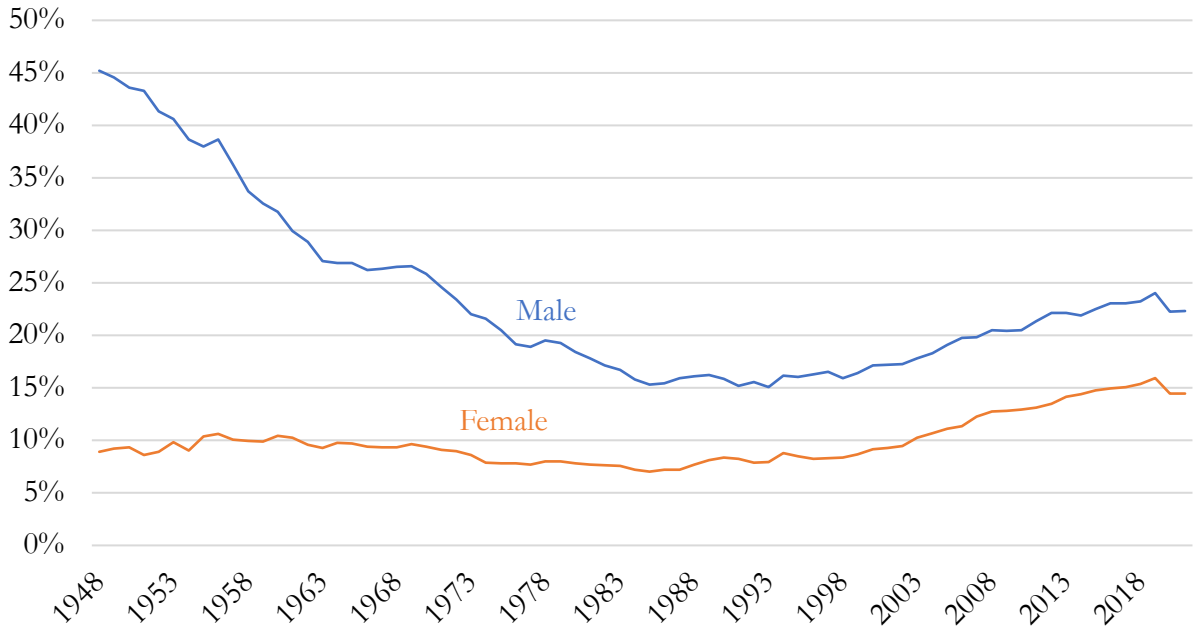
Notes: Data are from SCF and CPS. Income is inflation-adjusted using the PCE price index.

Figure B3. Share of senior households by non-senior quartiles (CPS)



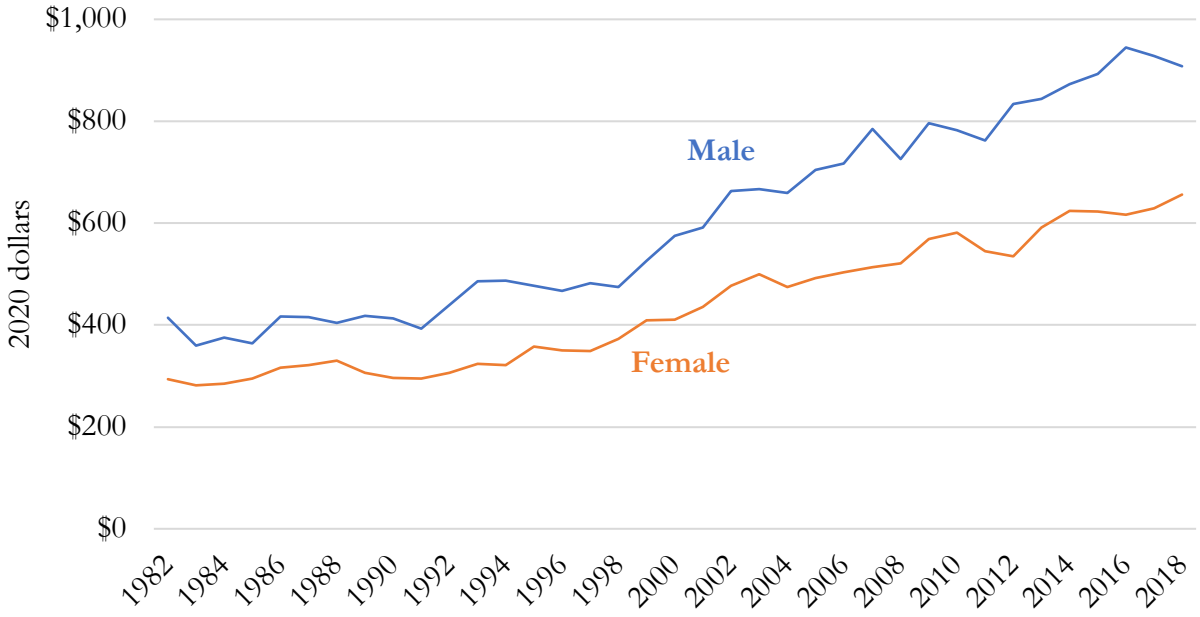
Notes: Data are from CPS.

Figure B4. Employment rates among seniors (CPS)



Notes: Data are from CPS.

Figure B5. Median weekly wages by sex in senior households (CPS)



Notes: Data are from CPS. Wages are inflation-adjusted using the PCE price index. Data includes household head and spouse (if present).

Appendix C. Distributional Analysis

C.1. Demographic Characteristics of Lower- and Upper-Income Senior Households

Differences in demographic characteristics play an important role in accounting for income differences between lower- and upper-income senior households. Table C1 shows these demographic characteristics. In 2018, less than one-third of all lower-income senior households are married couples. In contrast, more than two-thirds of upper-income households are married couples. These percentages show little change over time. The trend in the composition of households in which fewer females and more males are living on their own that we observed among all senior households is present among both lower- and upper-income senior households.

Table C1. Demographic characteristics of senior heads by income level

	Lower half		Upper half	
	1982	2018	1982	2018
Marital status				
Married	34%	27%	70%	71%
Single Female	56%	53%	23%	17%
Single Male	10%	21%	8%	12%
Age				
65-69	21%	29%	49%	36%
70-74	32%	25%	25%	28%
75 and older	47%	46%	26%	36%
Education				
High school or less	90%	53%	65%	22%
Some college	7%	26%	17%	25%
Bachelors or higher	3%	21%	19%	53%

Notes: Data are from SCF.

Levels of educational attainment among both lower- and upper-income senior household heads have increased substantially over time. Despite this growth, just over half of lower-income seniors had completed high school and only 21 percent had completed college in 2018. The opposite is true among upper-income seniors: just over half have completed college and 22 percent have completed only high school. Although educational differences between lower- and upper-income seniors have declined over time, the gap remains substantial. Age of the household head is also an important factor that distinguishes lower- and upper-income households heads. Heads of lower-income households tend to be older throughout the years covered by our data, but the age gap has been closing.

C.2. Earnings by Income Level

The strong growth of labor earnings among all SCF senior households occurs separately among those in the lower- and upper-halves of the senior income distribution. As shown in Table C2, mean labor earnings nearly quadrupled among the former group and doubled among the latter group. While labor earnings account for a far larger share of income among upper-income households (27 percent over the period analyzed), earnings among lower-income households have grown relative to total income. In 1982, earnings accounted for 5 percent of income among lower-income seniors, by 2018 the figure had doubled to 10 percent.

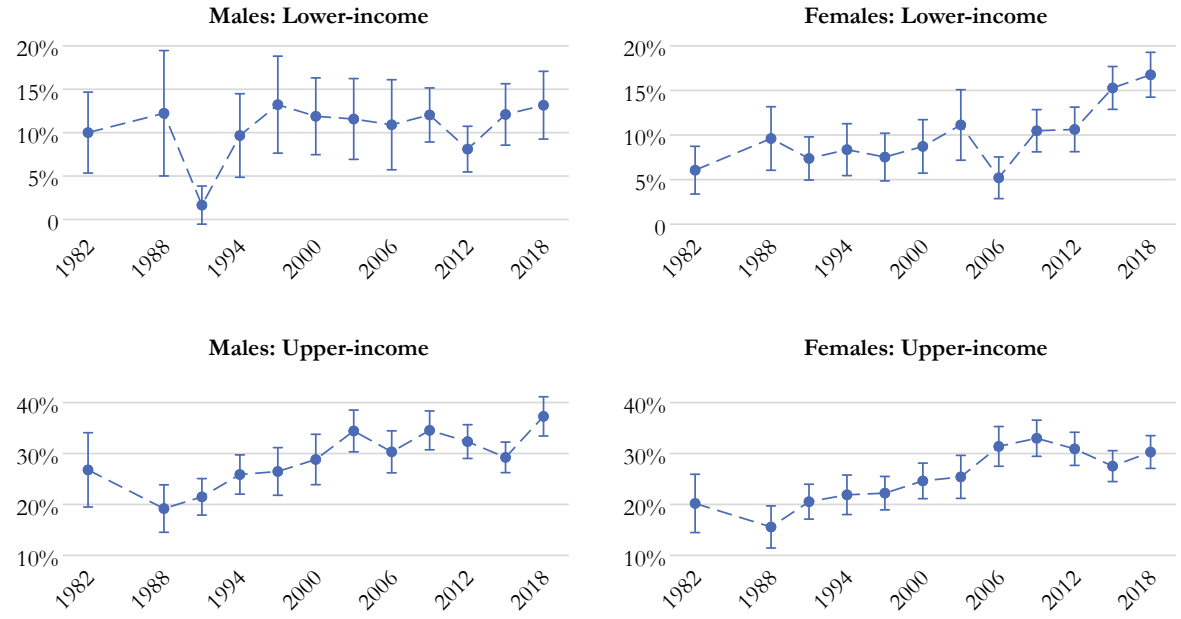
Table C2. Earnings among seniors by income level

	Lower half	Upper half
Level (2020 Dollars)		
1982	$700	$20,100
2018	$2,600	$42,800
Growth Rate	298%	113%
Share of all income		
1982	5%	28%
2018	10%	27%

Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Income distribution is limited to households with senior heads.

With one exception, the large increase in employment observed for all senior men and women is also present among men and women in lower- and upper-income senior households taken separately (see Figure C1). The exception is males in the bottom half of the income distribution for whom there are relatively few observations.

Figure C1. Employment rates by sex and income level in senior households (SCF)



Notes: Data are from SCF. Employment rates are for household head and spouse (if present).

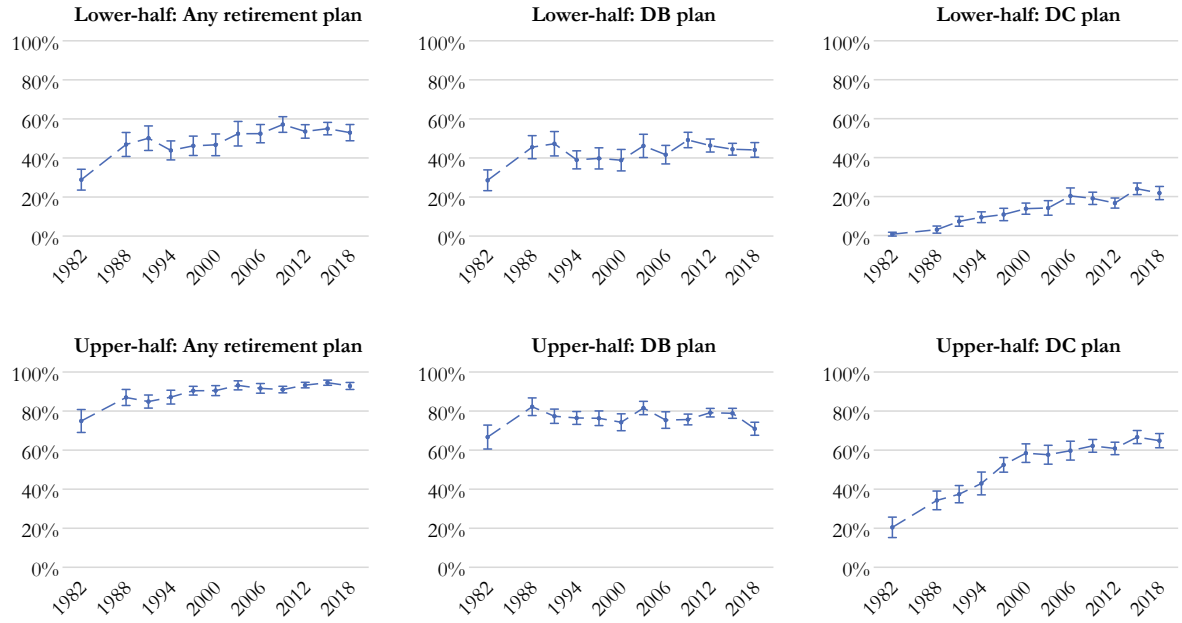
C.3. Retirement Plan Income by Income Level

Retirement plans have been a crucial source of income growth among both lower- and upper-income households during the years covered by our data. Income from retirement plans more than doubled among lower-income households and more than tripled among upper-income households. Both defined benefit and defined contribution plans have played an important role in this growth, but the former has been more important for lower-income seniors. Among lower-income seniors, 71 percent of the growth in retirement plan income is from defined benefit plan payments. Among upper-income seniors, defined benefit plan payments account for about half of the growth.

As was the case with labor earnings, there are large differences in retirement plan income between lower-and upper-income senior households. But in contrast to labor earnings, the differences in retirement plan income between the two income groups has been widening over time. In 1982, the mean retirement plan income among upper-income senior households was five times the mean among lower-income senior households. In 2018, it was eight times larger. Most of this increasing differential is due to more rapid growth in defined contribution plan income among upper-income senior households. Thus, while retirement plans have been an important income

source for all seniors, they have been particularly beneficial for those in the upper half of the senior income distribution.

Figure C2. Retirement plan participation rates in senior households by income level



Notes: Data are from SCF. Defined contribution plan includes IRA withdrawals. Bars reflect the 95 percent confidence interval.

The increase in mean retirement plan income among both groups has been accompanied by substantial increases in both retirement plan enrollment and mean retirement income among enrollees. As shown in Figure C2, the retirement plan participation rate among upper-income seniors, rose from 76 percent in 1982 to 90 percent in the late 1990s. It has remained between 90 percent and 95 percent since then. The participation rate among lower-income senior households started at only 30 percent in 1982, but it rose much faster to over 50 percent by 2003, where it has remained since. Participation in defined contribution plans accounts for virtually all of the increase in among both income groups. It has increased substantially among both lower- and upper-income senior households. The gains are particularly large among upper-income seniors, rising from 20 percent in 1983 to 65 percent. Participation among lower-income senior households, however, has also risen considerably, from close to zero in 1983 to 22 percent in 2019.

The growth in total retirement income is strong among retirement plan enrollees in both income groups, but the substantial gap that existed between the lower-and upper-income retirement plan enrollees in 1982 has widened over time. As shown in Table C3, the mean income of upper-income enrollees in 1982 was twice the mean among lower-income enrollees. In 2018, it was four

times higher. Income from defined benefit plans and defined contribution plans appear to contribute roughly equal amounts to the increase in retirement plan income among both income groups.

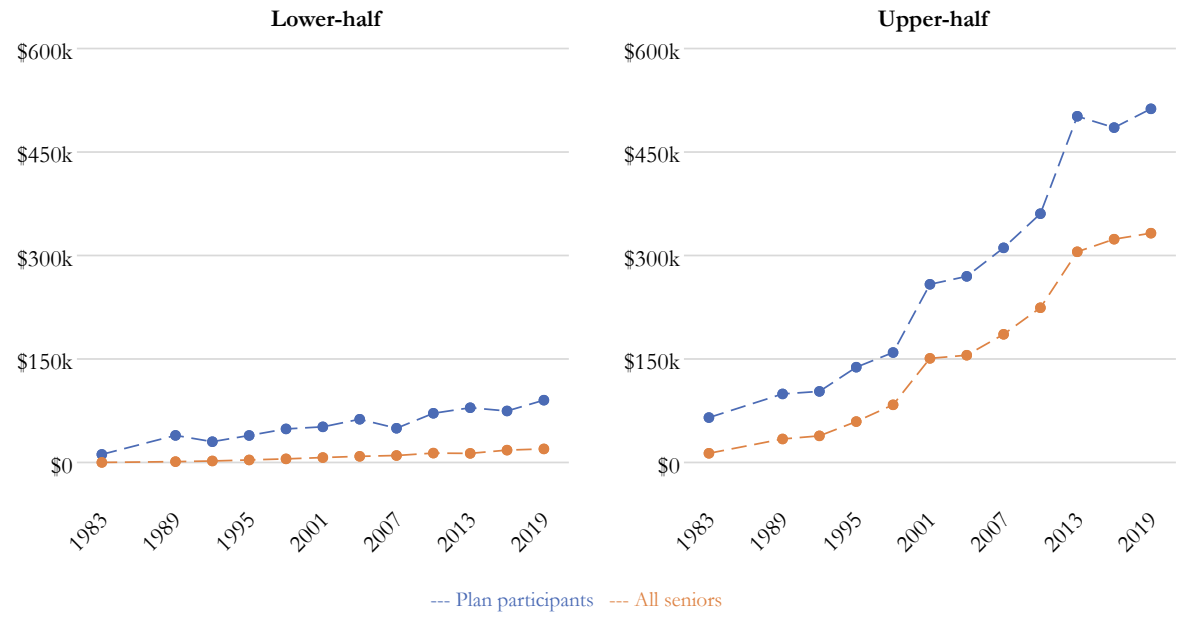
Table C3. Mean retirement income among senior households with plan by income level

	Lower half			Upper half		
	Any	DB	DC	Any	DB	DC
1982	$5,500	$5,600	$1,100	$11,400	$12,300	$2,200
2018	$9,400	$9,600	$3,500	$38,600	$32,700	$19,400
Growth	71%	72%	206%	237%	165%	770%

Notes: Data are from SCF. Income is in 2020 dollars using the PCE price index. Defined contribution plan income include IRAs. Income distribution is limited to households with senior heads.

As shown in Figure C3, asset balances of defined contribution plans have grown substantially among both lower-and upper-income senior households. But, as was observed for retirement plan income, the growth has been larger among upper-income households than it was among lower-income households.

Figure C3. Mean DC assets among participating seniors by income level (2020 Dollars)



Notes: Data are from SCF. Assets are inflation-adjusted using the PCE price index. Defined contribution plan includes IRAs.

C4. Non-Retirement Plan Income by Income Level

Average income levels from non-retirement plan assets, like labor earnings and retirement plan income, differ substantially between lower- and upper-income households. But unlike these two income sources, the growth in non-retirement plan asset income differs substantially between two income groups. Table C4 shows average income levels from assets in this category and the percentage of recipients for lower- and upper-income senior households separately. The average level of non-retirement plan asset income among lower-income households, always negligible, declined by 45 percent between 1982 and 2018. Meanwhile, the average among upper-income households increased by 72 percent.

Table C4. Mean non-retirement investment income among senior households by income-level (2020 dollars)

	Lower half			Upper half		
	Share receiving	Mean among recipients	Mean among all HH	Share receiving	Mean among recipients	Mean among all HH
1982	43%	$2,700	$1,200	86%	$31,300	$27,100
2018	20%	$3,300	$700	59%	$78,500	$46,600
Growth	-54%	21%	-45%	-31%	151%	72%

Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Income distribution is limited to households with senior heads.

Among both income groups, the percentage that receive any non-retirement plan income for this source declined due to the aforementioned reduction in the receipt of interest income. Among lower-income households, this decline more than offset the 21 percent increase in average non-retirement plan asset income among those who report receiving such income. The 21 percent increase was driven by increases in dividends and rental income. Among upper-income households, the opposite is the case. A substantial increase in rental income and to a lesser extent, dividends and capital gains realizations, outweighed the reduction in interest income.

C5. Distributional Analysis: Social Security

Table C5 shows the share of households that receive Social Security benefits and the mean benefit of households in the two halves of the senior income distribution. The share of households that receive benefits is similar between the two groups. In 1982, the mean household Social Security benefit among upper-income households is substantially higher than among those in the lower half in both 1982 and 2018. This differential grows over time, as the mean benefit among upper-income households rises faster than among lower-income households.

Table C5. Social Security participation among senior households by income level (2020 dollars)

	Lower half		Upper half	
	Participation rate	Mean benefit	Participation rate	Mean benefit
1982	90%	$11,600	94%	$17,400
2018	93%	$17,800	90%	$31,000
Growth	--	53%	--	78%

Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Mean benefit is limited to households with positive Social Security income. Income distribution is limited to households with senior heads.

About half of the differential in mean benefits between lower- and upper-income senior households in both years is due to higher benefit levels among upper-income household heads. This is shown in Table C6, which reports mean benefit levels of household heads. The difference between the mean benefits of lower- and upper-income household heads of $3,200 in 1982 accounts for 54 percent of the difference in total household benefits (reported in Table C5). The difference of $6,300 in 2018 is 46 percent of the difference in total household benefits.

Table C6. Social Security participation among senior heads by income level (2020 dollars)

	Lower half		Upper half	
	Participation rate	Mean benefit	Participation rate	Mean benefit
1982	90%	$10,200	92%	$13,400
2018	92%	$15,700	88%	$22,000
1982 to 2018 Growth	--	54%	--	64%

Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Mean benefit is limited to heads with positive Social Security income. Income distribution is limited to households with senior heads.

The remainder of the difference is due to two factors related to spouses' benefits. First, 70 percent of upper-income households are married couples in both years. Among lower-income households, married couples constitute only 34 percent in 1982 and only 27 percent in 2018. participation rates differ between spouses in the two income groups. Although the share of spouses receiving benefits differs between the two income groups, upper-income households are twice as likely to have two Social Security recipients than lower-income households. Second, mean benefits among spouses upper-income households are significantly higher than those in lower-income households. Moreover, as shown in Table C7, the differential between the two is growing over time.

Table C7. Social Security participation among spouses in senior households by income level (2020 dollars)

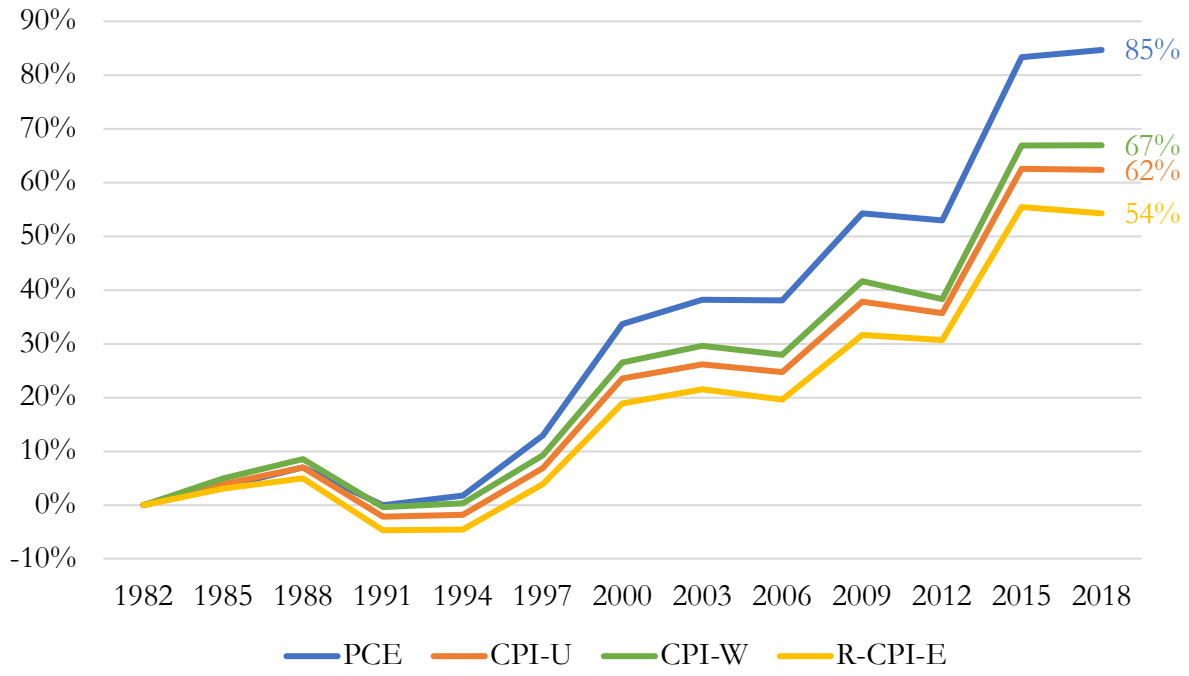
	Lower half		Upper half	
	Participation rate	Mean benefit	Participation rate	Mean benefit
1982	68%	$4,300	75%	$6,200
2018	79%	$8,000	74%	$13,300
1982 to 2018 Growth	--	87%	--	113%

Notes: Data are from SCF. Income is inflation-adjusted using the PCE price index. Mean benefit is limited to spouses with positive Social Security income. Income distribution is limited to households with senior heads.

Appendix D. Effect of inflation metric on income growth rates

Throughout our analysis, we use the PCE price index to inflate income and asset values. Here we show the effects of alternative inflation metrics on income trends. Three alternative metrics are examined: the CPI-U, the CPI-W, and the R-CPI-E.[57] The CPI-U is widely used to update benefit levels and income thresholds for many federal entitlement programs and, until 2018, it was used to update price-indexed provisions in the U.S. tax code. The CPI-U, however, has long been criticized for overstating increases in the cost of living.[58] The Social Security Administration uses the CPI-W to calculate the annual cost-of-living adjustments for Social Security recipients. The R-CPI-E is a research price index developed by the Bureau of Labor Statistics to estimate cost of living chains for Americans age 62 and older.[59] The R-CPI-E allows us to account for differences in cost-of-living trends for senior versus non-senior households.

D1. Median senior income growth under alternative price indices



[57] For the PCE, CPI-U, and CPI-W, we use the average annual value of the index. The R-CPI-E series begins in December 1982 so we use the December value of the index.

[58] The Advisory Commission to Study the Consumer Price Index (also known as the Boskin Commission) highlighted several of the early deficiencies of the index. For an overview of the Commission's findings see Boskin, et al (1998). The Bureau of Labor Statistics implemented some, but not all, of the Boskin Commission's proposed changes; see Gordon (2006) for an overview.

[59] A description of the R-CPI-E is available at https://www.bls.gov/cpi/research-series/r-cpi-e-home.htm.

Figure D1 shows the aggregate growth in real median income among senior households using the PCE and the alternative metrics. Each alternative metric estimates higher rates of inflation than the PCE, and thus the aggregate growth in median senior incomes falls. Senior incomes growth least under the R-CPI-E, but still rise by over 50 percent over the period analyzed. Figure D2 shows the growth in median income among non-seniors under the alternative indices. We do not include the R-CPI-E as it is intended to estimate cost-of-living changes among seniors and near seniors only.

D2. Median non-senior income growth under alternative price indices