

## Retirement Preparation and Wealth Distribution Among Early Savers

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### Abstract:

This paper develops a new combined wealth measure in the Survey of Consumer Finances, augmenting existing data on net worth with improved DB pension wealth and estimates of expected Social Security wealth. We used this combined wealth concept to explore retirement preparation among groups of households in their pre-retirement years (40-49 and 50-59), and also explore the concentration of wealth. We find evidence supporting short-falls in retirement preparation among the younger cohort. We also show that including DB pension and Social Security wealth results in markedly lower measures of wealth concentration. Trends toward higher concentration over time are also somewhat moderated.

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The wealth that households accumulate during their working years – through pensions, housing equity, and other types of assets – is crucial in providing income to sustain them in retirement. There is a large literature evaluating the adequacy of retirement resources among retirees and households transitioning into retirement, while there is also a growing literature using wealth data to explore inequality in the distribution of economic resources – beyond a more traditional emphasis on income and consumption. This paper uses the Survey of Consumer Finances (SCF) to make contributions to each of these areas of research.

The SCF is the only household survey that provides coverage of high-net-worth households in the U.S., but the wealth concept in the survey is incomplete. Importantly, household wealth in the SCF does not adequately reflect the asset value of defined benefit (DB) pensions. Further, it does not include the value of the future Social Security benefits that workers accrue over their lifetime. These additional forms of wealth are crucial resources to retirees but also impact decisions leading up to retirement. Crucially, they disproportionately benefit households below the top portion of the wealth distribution. As such, they are vital to our understanding the full distribution of wealth, and also to assessing the adequacy of savings of the cohort of workers who will be transitioning into retirement in the future.

We develop an expanded definition of household wealth [“combined” wealth], augmenting the asset and debt information collected in the SCF with estimates of the asset value of both traditional defined benefit (DB) pensions and expected Social Security benefits. We use this combined wealth concept to evaluate the resources of groups of workers approaching retirement age. Most of the retirement adequacy literature focuses on recently retired, or about-to- retire workers. Here we review preparation among households in their 50s, and also among a cohort of “early savers” in their 40s. Consistent with much of the existing literature, we find that expected

retirement income is adequate for most households, but leaves a substantial – and growing – number in or near poverty during their retirement years.

We also use the expanded resource concept to calculate levels and changes in the distribution of wealth. Some of the existing research exploring the distribution of wealth uses data that does actually not include households in the very top of the wealth distribution, and most of it does not reflect either the implied asset value of DB pensions or Social Security. Incorporating the asset-value of expected retirement benefits, particularly Social Security, has a dramatic equalizing effect on the distribution of wealth.<sup>1</sup> For example, among households with heads ages 40-49, the top five-percent share of wealth excluding retirement plans (DB, DC) and Social Security is 69 percent. Once these assets are included, the top five-percent wealth share falls to 47 percent. There is also a slight moderation on the over-time trend toward greater inequality once we incorporate all forms of retirement wealth.

In the remainder of this paper, we:

- Briefly review the retirement adequacy and the wealth inequality literatures, drawing attention to the contributions that we make in this paper;
- Describe the primary data we in this analysis – the SCF – as well as the methods and additional data sources we use in estimating household level earnings histories used to calculate expected Social Security benefits, and;
- Present our findings, both for retirement preparation, and for the distribution of wealth.

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<sup>1</sup> Wolff (2015) is the primary exception here, as he also uses the SCF and predicts earnings histories. His focus is primarily on the Gini Coefficient and broad inequality trends, not specifically top-end concentration. There are also a number of methodological differences between this paper and Wolff's.

## 2. Literature Review

The areas of retirement income adequacy and wealth concentration have each generated extensive literatures. Here we provide a very brief overview of each of these literatures, particularly focused on identifying the contribution we are making in this paper.

### *2A. Retirement Adequacy*

The extensive literature evaluating the adequacy of income for current and future retirees has been spurred on by dramatic changes in the demography of an aging country and equally dramatic changes in our retirement system which has transformed from a primarily DB pension system to an overwhelming DC system in just a few decades. The now-ubiquitous 401(k) plan was first introduced into law in 1978. As of late 1980s, traditional defined benefit pensions were still the typical plan for households with heads between 40 and 59. In 1989, nearly a third (29%) of these households were covered only by a traditional defined benefit pension, 20 percent by a DC plan only, and 21 percent were covered by both types of plans (**Figure 1, Table 1**). By 2013, seven percent had only a DB plan, 11 percent have both types of plans, and 41 percent rely exclusively on DC plans for their work-based pension. This transformation of the pension system has made benefits more flexible and portable, virtues appreciated by most workers. But, it has also shifted risk and decision-making from employers to workers, fueling considerable anxiety about retirement preparation.

As this transformation of the pension system has unfolded, a number of researchers have worked to understand the consequences for the adequacy of retirement income for older Americans. On the central question of the status of the adequacy of retirement income, the literature is divided. Some papers have identified large shortfalls in the adequacy of retirement savings (Bernheim

(1992), Munell (NRRI (2006, 2014), Haveman et al (2006), Munnell, Orlova, Webb (2013)).

Others have concluded that household financial preparation for retirement is in much better shape, and any shortfalls are largely concentrated among specific, more vulnerable, groups such as single retirees (Engen, Gale, and Uccello (1999), Sholz, et al (2006), Love, McNair, Smith (2008)).

One of the methodological factors that differentiate these – and other – studies is the way they define “adequacy.” Adequacy is typically determined by comparing anticipated household income in retirement to pre-retirement income. Replacement rates are “adequate” if they provide a smoothed level of consumption across working life into retirement with a potential step-down adjustment at the point of retirement.<sup>2</sup>

Another approach to defining adequacy assumes declining levels of consumption over the retirement period, based on models where households smooth the marginal utility of consumption over the lifecycle using assumptions on preference parameters and changes in consumption when children leave home (Sholz, Seshadri, and Khitatrakun (2006), Engen, Gale, and Uccello (1999)).

Differences in these first two approaches to defining adequacy go a long way to reconciling the competing findings from the more optimistic and pessimistic findings on retirement adequacy. When Sholz et al (2006) assume a more standard life-cycle rule using annual consumption as a function of lifetime resources, they find 49 percent of households have inadequate savings as compared to only 16 percent under their declining rate optimized path of consumption. Similarly, when Munnell, Rutledge, and Webb (2014), adjust the adequacy rules in the NRRI, to

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<sup>2</sup> See Biggs and Springstead (2008) for a discussion of alternative standards of adequacy of replacement rates.

incorporate the same optimal rates of asset drawdown as implied in Sholz et al (2006), the share of households (heads age 51-61) with inadequate retirement resources falls from 35 percent to 24 percent. When they further incorporate the assumption Sholz et al (2006) use about the decline in consumption when children leave the home, the share of households with inadequate savings fall further to 11.5 percent.

A third approach is to use an external benchmark to indicate socially acceptable levels of consumption in retirement (Wolff (2002), Haveman, Holden, Wolfe, and Romanov (2006), and Love, Smith, McNair (2008)). One implication of the replacement rate or smoothed consumption approaches to defining “adequacy” is that, because they are determined relative to the household’s own income history, poor households who are able to maintain the same poverty-level consumption in retirement are considered to have “adequate” resources. Households with much higher absolute standards of living might be considered to have inadequate resources. Hurd and Rohwedder (2011) use observed consumption paths over retirement from panel data (HRS) as a benchmark, identifying adequacy among recent retirees as sufficient income to afford retirement consumption and still be able to leave a bequest.

Most research on retirement income adequacy uses data from the Health and Retirement Survey (HRS). The HRS is a high quality household survey of older Americans with a battery of questions on household income and resources. In recent years, researchers have been able to link the HRS to individual SSA earnings histories, and through employer-specific pension plans. Studies with the HRS either explore adequacy among current retirees (Hurd and Rohwedder (2011), Moore and Mitchell (1997)) or used self-reported, expected pension and benefits income to explore adequacy for those about to retire (Engen, Gale, and Uccello (1999), Love, Smith, McNair (2008)).

The HRS offers many advantages to researchers in this field, but has some limitations as well. Because of the survey design, the HRS cannot tell us anything about the savings or anticipated retirement adequacy among younger workers. A number of studies using the HRS evaluate adequacy among workers as young as 51 (Munnell, Orlova, Webb (2013); Gustman and Steinmeier (1999), and; Scholz, Seshardi, and Khittrakun (2006)). Also, because it does not include high net-worth households, the HRS cannot be used to fully evaluate the implications of Social Security on wealth concentration. And, while the ability to match to SSA earnings is important, not all respondent agree to the match, and researchers need to estimate earnings for the missing records. Also, there is some evidence of bias introduced by the selection of respondents who agree to the match (Bricker and Engelhardt (2014)).

A number of studies have also explored retirement adequacy using the Survey Consumer Finances. Because the SCF samples the entire age distribution, these studies have looked at retirement income among younger cohorts of savers. All of these studies use the self-reported DB pension responses in the SCF, and use out-of-sample data to predict earnings histories into the survey for calculating future Social Security benefits.

Kennickell and Sunden (1997)) use the age/earnings profile from one year of CPS data to predict earnings histories to households under age 65. Wolff (2002, 2006, 2007, 2015), predicts earnings histories within the SCF using respondent-provided current and past-job information and earnings history questions, and an in-sample prediction of future earnings based on a simple human capital earnings regression. He then uses those predicted retirement incomes to evaluate adequacy in several years of the SCF among relatively younger cohorts than are evaluated using the HRS (47 to 64 years olds (Wolff 2002, 2006) and 40 to 55 year olds (Wolff 2007)).

The National Retirement Risk Index (NRRI), developed by Alicia Munnell and her colleagues at Boston College's Center for Retirement Research, also uses the SCF to evaluate retirement adequacy. The NRRI imputes earnings histories into the SCF through a statistical match to the linked HRS/SSA earnings data. The NRRI calculates adequacy across the full age distribution. Since the HRS only includes workers in their 50s and above, a number of additional assumptions are needed to predict earnings histories and futures for younger workers.

## *2B. Wealth Distribution*

The fact that wealth – particularly financial assets – is highly concentrated at the top of the distribution has long been acknowledged, and, in fact, is the motivation for the unique sampling strategy employed in the Survey of Consumer Finances. Results from the 1989 SCF indicate that the top one percent of households held 16 percent of all income, but 30 percent of net worth (Bricker et al, 2016). Most research exploring the distribution of wealth in the US relies on the SCF (Bricker et al (2016), Keister and Moller (2000); Wolff (1995), Kennickel (2006)). Some wealth distribution research uses the PSID, which also includes questions on assets and debt (Quadrini (1999), Banks, Bludell, and Smith (2003)). These studies yield lower estimates of wealth concentration because the PSID does not adequately sample high wealth households and it does not ask about some asset-types that are disproportionately held by the wealthy (Juster, Smith, and Stafford (1999); Pfeffer, Schoeni, Kennickel, and Andreski, 2016). The top 5 percent wealth share for 1989 was 47 percent in the PSID, but 57 percent in the SCF (Wolff, 2006).

It is well known that wealth is highly concentrated, and that accurate measurement of its concentration is highly dependent on the use of data that includes high wealth households. The extent to which the concentration of wealth has risen over time, however, is in dispute. Analysis of net worth in the SCF suggests top wealth shares have increased somewhat, with the top one



percent share climbing to 35 percent by 2013 (Bricker et al, 2016). Saez and Zucman (2016) point to certain short-comings of the SCF, including the deliberate exclusion of the richest 400 households from the data and the treatment of pension wealth, and propose an alternative wealth measure based on income tax data. Similar to the wealth-prediction model used by the Federal Reserve since 1989 to draw its high-wealth sample for the SCF, Saez and Zucman (2016) use a well-known ‘gross capitalization’ technique to predict wealth based on flows of capital income reported on federal income tax forms and rates of return estimated from the Financial Accounts and other macro-data sources. They find that wealth predicted from tax returns rises much faster than reported wealth – with the top one percent share climbing from 28 percent in 1989 to 42 percent by 2012.

The estimates presented by Saez and Zucman are highly sensitive to the rates of return assumed for different types of assets. Bricker et al (2016) show that using a market-based rate for fixed-income assets, as opposed to the macro-data based estimate employed by Saez and Zucman, generates levels and trends in predicted wealth concentration much closer to what is found in the SCF. Bricker et al also develop an augmented version of the SCF, incorporating the wealth of the 400-richest households and allocating wealth for DB pension plans and find the trend in the top one-percent wealth share is the same as the trend reported in the main survey, but is several percentage points lower.

Each of these papers improves our understanding of trends in the distribution of wealth, but neither uses a wealth concept that includes the implied asset value of Social Security benefits. Devlin-Foltz et al (2016) show that inclusion of improved measures of DB pension wealth results in somewhat lower measures of wealth concentration in the SCF, and we build directly on that work. The absence of Social Security from the discussion of wealth concentration is troubling for

a number of reasons. Social Security benefits represent the single-largest source of retirement income for more than 60% of retired households (Social Security Administration, 2016). Since accumulation of wealth to finance retirement is the dominant reason for savings, and Social Security may ‘crowd out’ private savings for many lower income households, discussions of wealth distribution, especially in the context of economic policy, that do not include the value of Social Security are limited at best and potentially misleading.

### **3. Data and Methods**

To improve the measurement of wealth concentration, and extend the research on retirement income adequacy to a younger cohort of households, we use the SCF and develop an expanded measure of wealth that incorporates both improved estimates of DB wealth as well as the asset-value of Social Security among the 40-59 year old population. We build directly on the work of Devlin-Foltz et al (2016) who impute the value of DB wealth to current workers in the SCF using labor market and pension plan characteristics in the survey along with high quality external data on DB plan assets, as well as Kennickell and Sunden (1997) who impute Social Security wealth into the 1989 and 1992 SCFs using a single year of the Current Population Survey to predict earnings histories. In this section we discuss the Survey of Consumer Finances and also describe the methods we use in estimating earnings histories of survey respondents and calculating future Social Security benefits.

#### *3A. SCF*

The primary data source we use is the nine waves of the Federal Reserve Board’s triennial Survey of Consumer Finances (SCF) conducted between 1989 and 2013. Several features of the SCF make it appropriate for exploring retirement income adequacy and the distribution of

wealth. The survey collects detailed information about households' financial assets and liabilities, and has employed a consistent design and sample frame since 1989. As a survey of household finances and wealth, the SCF includes some assets that are broadly shared across the population (bank savings accounts) as well some that are held more narrowly and that are concentrated in the tails of the distribution (direct ownership of bonds).

To support estimates of a variety of financial characteristics as well as the overall distribution of wealth, the survey employs a dual-frame sample design. A national area-probability (AP) sample provides good coverage of widely held assets and debts. The AP sample selects household units with equal probability from primary sampling units that are selected through a multistage selection procedure, which includes stratification by a variety of characteristics, and selection proportional to their population. Because of the concentration of assets and non-random survey response rates by wealth, the SCF also employs a list sample which is developed from statistical records derived from tax returns under an agreement with IRS's Statistics of Income (SOI).<sup>3</sup> This list sample consists of households with a high probability of having high net worth.<sup>4</sup> The SCF combines the observations from the AP and list sample through weighting. The weighting design adjusts each sample separately using the information available for each sample. The final weights are adjusted so that the combined sample is nationally representative of the population and assets.<sup>5</sup> These weights are used in all calculations.

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<sup>3</sup> See Bricker et al (2014) and Bricker et al (2016) for recent discussions of the sampling strategy, the list sample, and the weights used in the SCF. See Wilson and William J. Smith (1983) and Internal Revenue Service (1992) for a description of the SOI file. The file used for each survey largely contains data from tax returns filed for the tax year two years before the year the survey takes place.

<sup>4</sup> For reasons related to cost control on the survey, the geographic distribution of the list sample is constrained to that of the area-probability sample.

<sup>5</sup> The SCF weights were revised in 1998 to incorporate home ownership rates by race (Kennickell, 1999). Weights for earlier years were updated to reflect the revised methodology.

The primary purposed of the SCF is to collect information about household balance sheets.

Assets measured in the SCF include the value of all financial and nonfinancial assets, including residential and non-residential real estate and privately-held businesses, reported by the respondent at the time of the interview.<sup>6</sup> Questions on household debt reflects all types of debt, including credit cards, mortgage debt, student loans, business debts, and other miscellaneous forms of debt.<sup>7</sup>

One short-coming of the SCF, for the purposes of this research, concerns future DB pension plans and Social Security benefits for the working population. Respondents enrolled in DB pension plans are asked questions about expected future benefits. Many workers, particularly those not close to retirement age, know very little about their plans or future benefits, and the information collected from these questions is not a good reflection of what they will actually receive (Starr-McCluer and Sunden, 1999). The SCF asks all respondents about their anticipated retirement age, but does not ask future retirees about their expected Social Security benefits.

In this paper, instead of using the expected future benefit responses provided by DB plan participants, we use the estimated DB pension wealth for SCF households developed by Devlin-Foltz, Henriques, and Sabelhaus (2016). In that research, the authors distribute aggregate household sector DB assets from the Financial Accounts of the United States (FA) across and between current and future beneficiaries using fixed real discount rates, life tables, benefits currently received for those receiving, wages and years in the plan for those not-yet-receiving

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<sup>6</sup> Assets do not include – and the SCF does not collect information on the value of defined benefit pensions or the implied annuity value behind future or current Social Security benefits of respondents.

<sup>7</sup> The unit of analysis in the SCF is the “primary economic unit” (PEU) which refers to a financially-dependent related (by blood, marriage, or unmarried partners) group living together. This concept is distinct from either the household or family units employed by the Census Bureau, but is conceptually closer to the latter, and throughout this paper PEUs are referred to as “families.” Single individuals living alone are included and simply considered a “family” of one.

benefits, and the assumption that current beneficiaries have first claim to DB plan assets. Devlin-Foltz, Henriques, and Sabelhaus (2016) find that inclusion of the implied assets from future pension benefits modestly reduces inequality in the distribution of wealth, but they do not include implied wealth from future Social Security benefits. To develop estimates of future Social Security benefits, and their implied asset value, we first need to estimate earnings histories [and projections] of respondents and their spouses for the SCF.

### *3B. Methodology for Estimating Earnings Histories in SCF using CPS cohorts*

To construct a full earnings history and projections going forward for SCF respondents, we apply the growth in earnings over one's working life implied by the shape of CPS earnings estimates for individuals most similar to the SCF respondent based on birth year, occupation, education level, and sex.

From the 1989-2013 SCF data we take respondents over age 40 at the time of the interview (with spouses being at least 30 years old) and use the information they provided to the SCF on current occupation, earnings, and tenure as well as any retrospective occupation, earnings, tenure information in addition to future work expectations. For each respondent and spouse, we estimate a full history of past earnings and project forward using CPS estimates described below – using CPS data from 1964 to 2013 – by assuming a real growth of one percent in wages in the future.

Respondents in the CPS and SCF are categorized into types depending on where they lie within one of 20 possible birth-year cohorts (three-year cohorts beginning in 1924-26 and ending 1981-83), 3 education levels (less than high school, high school or equivalent, some college/degree), and 5 broad occupation categories ((1) management, professional, and related, (2) service, (3)

sales and office, (4) construction, maintenance, production, transportation, and (5) the self-employed of all occupations).

In addition, for some ages we also use more broadly defined education-occupation types (for men and women each) for the ages an individual's birth year cohort is not observed in the CPS. For instance, the youngest person whose historical and future earnings we want to estimate is born in 1983 and 30 years old at the time of the 2013 SCF interview. The estimates will be based on earnings for those also born in 1983 who are up to age 33 in the 2016 CPS. To forecast earnings growth after age 34, we use coefficient estimates based off of the more general education-occupation type model. Similarly, for the oldest birth year in the earliest (1989) SCF, 1924, we use the more general education-occupation type coefficients to fill in earnings prior to when they would have others in their birth year observed in the 1964 CPS. Those born between 1942 and 1951 will be fully covered in the CPS.

For each of the types,  $g$ , we estimate the following regression on log income in the CPS

$$\ln(y^g) = \beta_0^g + \beta_1^g age + \beta_2^g age^2 + \beta_3^g age^3 + \beta_4^g age^4 + \beta_{PT}^g PartTime$$

to back out an individual's permanent individual effect,  $\beta_{0i}$ , at the time of the SCF survey

$$\beta_{0i} = \ln(y_i) - \beta_1^g age_i + \beta_2^g age_i^2 + \beta_3^g age_i^3 + \beta_4^g age_i^4 + \beta_{PT}^g PartTime_i$$

and then apply  $\beta_{0i}$ ,  $\beta_1^g$ ,  $\beta_2^g$ ,  $\beta_3^g$ ,  $\beta_4^g$ ,  $\beta_{PT}^g$  going forward and back in age for the SCF respondent.<sup>8</sup> An individual in the SCF who reports a longest prior occupation type that is

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<sup>8</sup> There are 750 possible types: 600 of the more specific cohort-occupation-education-sex combinations, 120 cohort-education-sex combinations (applied when occupation is unclear), and 30 occupation-education-sex combinations (applied when estimating earnings when outside the ages the birth year cohort is observed in the CPS or some information is missing).

different from his current occupation will have different coefficients applied to the relevant years. Earnings profiles coming from CPS models for broadly defined types are shown in the Appendix.

As an example, suppose we have a 2013 SCF respondent who is 50 years old at the time of the survey, reports current full-time earnings of \$55,000 in his current job of 8 years (**Figure 2**). The longest prior job he reports, which lasted 12 years, was in a different occupation and ended 14 years ago with his earning \$38,000. He reports having worked full-time every year since age 20 and expects to end work at age 65. The earnings history and projection for this individual would look something like the following:

The estimates we use assume that there is no transitory component to an individual's income but rather that each has only a permanent effect that does not vary over time. It is more realistic to assume some component of earnings is transitory, and that this transitory effect is given more weight as we move away from the year of reported earnings in the SCF, so that the total individual effect moves towards one's group average constant component. This not being a model of individual decision making makes that issue somewhat less pronounced but will affect each individual's estimated Social Security wealth, and will be addressed in future versions.

### *3B.i. Details of Social Security benefits calculations*

Armed with an earnings profile for each individual from ages 20 through 61, one can apply Social Security benefit calculations for each household. First, nominal earnings are indexed to age 60, the highest 35 of which are used to calculate each individual's averaged indexed monthly earnings (AIME). The AIME is transformed to a monthly payment using the primary insurance amount (PIA) formula and the appropriate actuarial adjustment, based on birth cohort. We

assume all individuals begin benefits at age 62, which provides a lower bound for total household Social Security wealth (SSW). Future benefits are discounted to survey year using a 3% real discount factor and survival rates which vary by cohort (relying on birth tables from 1980, 1990 and 2000).

Spouses are entitled to their own benefits (if eligible) but also spouse and survivor benefits. We assign spouse benefits based on whether spouse benefits are larger than spouse's worker benefits at age 62. If marriages are less than 10 years at age 62, the spouse does not receive spousal or survivor benefits.

The measure of SSW we use is net of expected future contributions. Thus, for every year (after the survey) that we have an estimated annual earnings, we calculate expected tax payments of 6.2% and subtract all future contributions from the gross SSW measure calculated (as detailed above).

### *3B.ii. Creating the combined wealth measure*

The combined wealth measure that we analyze below is created by summing the implied wealth of Social Security benefits, net of contributions and including future projected work up until the time of retirement, with the current (at time of survey) wealth from DB pensions and from all other assets and debt. This will understate the amount of non-Social Security wealth households will accumulate prior to retirement. In future, we will explore approaches to incorporating anticipated growth of these other forms of wealth (to measure expected household wealth at the age of retirement).

### *3C. Retirement Preparation Concepts*



At this early stage of our analysis, we use two simple measures of household preparation for retirement. The first is wealth to income ratios. These divide the wealth concept we are discussing by the current reported household income. The second is an annuity measure of wealth. We compare the estimated annuity amount to the poverty level for elderly households, either 1 or 2 person households depending on the current marital status of the respondent.<sup>9</sup> We also calculate the share of the population falling below various multiples of the poverty threshold. For both basic measures of adequacy, we explore trends over time and levels among various population sub-groups. In future, we will explore income replacement ratios similar to what is seen in much of the literature, incorporating a variety of approaches to reflecting smoothing of consumption over the life-cycle.

#### 4. Results

In this section we describe the results, for both retirement income adequacy and wealth concentration, from our combined wealth measure, supplementing SCF net worth with improved DB pension estimates and predicted Social Security wealth. We show results over time for each SCF cross-section from 1989 to 2013, and for both the 40-49 and 50-59 year old cohorts. We first show means, medians, and total levels of various wealth categories. Next we show wealth to income ratios, followed by annuitized poverty measures. Then we calculate wealth percentile ratios and concentration measures.

#### 4A. Retirement Wealth and Combined Total Wealth

##### 4A.i. Components of Retirement Wealth (**Table 2, Figure 3**)

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<sup>9</sup> The annual annuity amount is based on an assumed five percent rate, and the number of periods is based on the self-reported expected lifespan of the respondent, averaged with spouse if present.

The average wealth in defined contribution plans held by both age-groups has followed a familiar path, rising substantially in the years before the financial crisis and declining after. Among 50-59 year olds, mean DC balances were \$50,000 in 1989 and had risen to \$160,000 as of 2007, falling back to \$140,000 by 2013. Mean DC balances are considerably lower among the 40-49 age group and hit a plateau in 2001 (\$80,000), showing little change in the years since. The data indicate both substantial preparation prior to age 40, but a substantial amount of retirement wealth accumulation is taking place as households move closer to retirement.

Over the 1989 to 2013 period, we see declines in DB wealth as a share of total retirement wealth for both age groups. Up through the mid-1990s for 40-49 year olds, and the early 2000s for the 50-59 age group, mean household DB wealth exceeded DC wealth. Since 1998, mean DB wealth among the younger age group has remained relatively steady, hovering around \$50,000. Among the older group, DB wealth continued to rise, but now constitutes a slightly smaller share of total retirement wealth. DB wealth for 50-59 year olds was \$145,000 in 2010 and fell to \$115,000 in 2013. A large part of the difference in DB wealth we observe between the two age groups is mechanical. As workers get closer to retirement age, more assets will have been put aside by their employer to fund the future payments (how an actuary would fund the plan).

Predicted Social Security wealth (SSW) accounts for the largest portion of retirement wealth for both age groups. Mean SSW rose from \$95,000 in 1989 to \$125,000 in 2013 among 40-49 year olds, and from \$170,000 to \$210,000 over the same period for 59-59 year olds. SSW rises along with earnings growth in the working population, and has fallen slightly since the mid-2000s among the younger age group and since 2010 among the older group. The broad growth in SSW broadly comes from two sources: increased real wages and increased labor force participation of women.

#### 4A.ii. Combined Wealth Measures (**Table 2, 3, Figure 4**)

It is well-known that the 2007 financial crisis and housing market crash led to large losses of wealth throughout the economy. The bulk of these losses occurred in assets that are not specifically identified as forms of retirement saving. “Non-retirement” wealth here includes housing and other forms of financial and non-financial wealth, and only excludes DC and DB plan wealth and implied Social Security wealth.

Combined wealth among 40-49 year olds rose from \$520,000 in 1989 to \$715,000 in 2007, and fell back to \$610,000 in 2013. Among 50-59 year olds it rose from \$745,000 in 1989 to \$1.3 million in 2007, before falling to \$1.1 million 2013.

Compared to the mean values just reported, the median of the distribution of combined wealth rose less between 1989 and 2007 and fell relatively farther after the financial crisis. For the younger age group we see median combined wealth levels in 2013 that are lower than in 1989, and 2013 levels are only slightly higher than 1989 for the older group. Median combined wealth among 40-49 year old was \$280,000 in 1989 and \$230,000 in 2013. For 50-59 year olds, median wealth was \$420,000 in 1989 and \$470,000 in 2013.

#### 4A.iii. Combined Wealth Across the distribution (**Tables 4, 5**)

The individual components of the combined wealth measure we are using here have very different distributions. We explore the wealth levels at different points in the distribution in two ways. First, we look at the distribution of each of the separate components (non-retirement wealth, DC wealth, DB wealth, Social Security wealth net of financing, and combined wealth which includes all of these components), by age and year. This highlights the fact that some

components of combined wealth are distributed more equally than others, with results shown in Table 4.

Since most households have no DB pension wealth, the values at the 10<sup>th</sup>, 25<sup>th</sup>, and 50<sup>th</sup> percentiles of DB pension wealth are zero for both age groups. The bottom of the DC pension distribution is similarly low. Most households have some form of DC plan, but the median of the DC wealth distribution was just \$7,000 in 2013 among 40-49 year olds and \$11,000 among 50-59 year olds. Both non-retirement wealth and Social Security wealth are far more broadly distributed than either DB or DC wealth. Non-retirement wealth is very concentrated at the top, but – especially prior to the financial crisis – households at the bottom of the distribution do have some non-retirement wealth. Social Security is the only asset where the lower tail of the distribution represents substantial wealth, with the 10<sup>th</sup> percentile being valued at \$35,000 in 2013 among 40-49 year olds and \$80,000 among 50-59 year olds. Among all of the components of the combined wealth measure we have constructed, Social Security is distributed most equally.

Second, we choose a specific distribution (various points in the distribution of wealth including retirement plans) and show the levels of each of the wealth components at those points. This highlights the composition of total wealth at various points in the distribution.

These results, shown in **Table 5**, make it very clear that households at the bottom of the wealth distribution rely heavily on Social Security, which for all wealth at the 10<sup>th</sup> percentile of the wealth distribution for both age groups and close to 90 percent of combined wealth of households at the 25<sup>th</sup> percentile. By contrast, Social Security only accounts for less than one-fifth of combined wealth for households at the 90<sup>th</sup> percentile of the distribution, for both age groups.

## 4B. Retirement Preparation Measures

### 4B.i. Wealth to Income Ratios (**Figure 5, Table 6A,B**)

Over most of the period between 1989 and 2007, combined wealth to income ratios (WTI) rose for different parts of the distribution (P25, P50, and P75) for both 40-49 and 50-59 age groups. Following the financial crisis, median combined WTI fell for all groups. Median combined (WTI) for 2007 was 4.6 among 40-49 year olds and 8.6 among 50-59 year olds, by 2013 these ratios had fallen to 3.7 and 7.9 respectively.

Following the financial crisis, retirement plan (DB + DC) WTI dipped slightly for both age groups, but Social Security wealth counteracted that decline. Overall retirement wealth WTI (DC + DB + SSW) was flat between 2001 and 2013 for 40-49 year olds and actually rose among the older age group. The decline in the combined wealth (WTI) ratio after 2007 is primarily due to decline in non-retirement wealth.

### 4B.ii. Annuitized wealth to poverty thresholds (**Table 7, Figure 6**)

The mean annuitized wealth to poverty ratio was rising among both age groups in the periods leading up to 2001. It started to decline in the early 2000s, and fell more sharply in the wake of the financial crisis. Among 50-59 year olds this indicator rose steadily, climbing from 5.9 to 9.6 between 1989 and 2001. By 2013, however, the annuitized wealth to poverty ratio for this group had returned to 1989 levels. For 40-49 year olds, movement in this indicator was considerably more muted over the entire period, rising less and falling less, but by 2013 the annuitized measure hit 3.1, well below 1989 levels.

Removing housing from the annuitized wealth measure produces a smaller ratio that follows a parallel path as the original indicator, at least until 2007. The decline in the annuitized wealth to poverty ratio is attenuated somewhat once we exclude housing.

When we calculate the share of households falling below various multiples of the poverty threshold we see loosely consistent patterns, with the “below poverty” share falling early in the period and then rising later, at first slowly then sharply. One important distinction in the trends suggested by the two ways of comparing the annuitized wealth to poverty thresholds is that the share below poverty declines only in the first half of the 1990s. In the latter 1990s, when the mean annuity to poverty threshold is rising most, we see the share below poverty flattening out and starting to rise. Among 50-59 year olds, share below the poverty threshold (1X) was 16.1 percent in 1989 and 9.0 percent at its low-point in 1995, before climbing to 19.2 percent in 2013.

The annuitized wealth measures leave a substantial number of 40-49 year olds below the poverty threshold regardless of the multiple. Forty-four percent have annuitized wealth below the poverty level, and just over two-thirds fall below twice the poverty level.

#### 4C. Wealth Distribution (**Tables 8, 9, Figure 7, 8, 9**)

Looking to ratios of wealth from the 90<sup>th</sup> and the 50<sup>th</sup> percentiles of the distribution, we see inequality rising over the 1989 to 2013 period, and that inclusion of Social Security and retirement plan wealth has an impact on both the level of inequality at its trend. Among 40-49 year olds, the P90/P50 of non-retirement wealth rose from 5.1 in 1989 to 13.4 in 2013; among 50-59 year olds it climbed from 6.4 to 8.9 (**Figure 7**). After including both retirement plan wealth and SSW, the P90/P50 rose only from 3.2 in 1989 to 5.1 in 2013. For 50-59 year olds,

essentially all of the increase had taken place by 2001, with the P90/P50 rising from 3.5 in 1989 to 3.9 in 2001, and then to 4.0 by 2013.

When we calculate the share of wealth held at the top of the distribution within these age cohorts, ranked by wealth separately for each age group, we find similar results. Including Social Security results in significantly lower top shares and also shows less growth in top shares.

The top five percent share of non-retirement wealth among 40-49 year olds rose from 51 percent in 1989 to 69 percent in 2013, with nearly all of that increase occurring since 2001 (**Figure 9**).

Among the older group of households, much of the increase in the top five percent share of non-retirement wealth occurred between 1989 and 1995, when it jumped from 50 percent to 59 percent. Following the financial crisis, the top five percent share climbed again, reaching 64 percent in 2013.

Including both retirement plan and Social Security wealth results in substantially lower estimates of top wealth shares. Among 40-49 year olds, the addition of retirement plan wealth decreases the top five percent share to 58 percent, and SSW lowers it further still to 47 percent. The effect on top shares among the older group is similar, with the top five percent share of the combined wealth measure falling to 42 percent in 2013.

The trend toward rising concentration is also moderated once we include pensions and Social Security. Between 1989 and 2013, the top five percent share of non-retirement wealth rose 18 percentage points, while the top share of wealth including retirement plans rose 11 points, and wealth inclusive of retirement plans and SSW rose only 8 points. Among 50-59 year olds, the top five percent shares for each of these measures rose 14, 10, and 8 points, respectively.

The effects of including retirement plan and Social Security wealth on the levels and trends in the top 10 percent wealth share is very similar, and is shown in **Figure 8** and **Table 9**.

## 5. Conclusion

When we look at the retirement preparation of a younger cohort of households, we see a substantial number households with expected incomes that are inadequate, based on the annuitized wealth to poverty thresholds measure. The share of households, both in their 40s and in their 50s with predicted retirement incomes below the poverty rate has been rising over most of the last two decades. We also find that incorporating Social Security into wealth concentration measures results in lower top shares that are rising somewhat less over time than what we see looking at the standard net worth concept.

This effort remains a work-in-progress on a number of dimensions. Among the limitations to the current set of results are the fact that all non-Social Security assets of near-retirement cohort of workers based on currently accrued asset values. Realistically, most members of the cohort, particularly the youngest members, will work more years building additional DC plan wealth, and also save or inherit more, building their non-retirement wealth. Future version of this paper will project other wealth forward along the same lines as we have done for earnings.

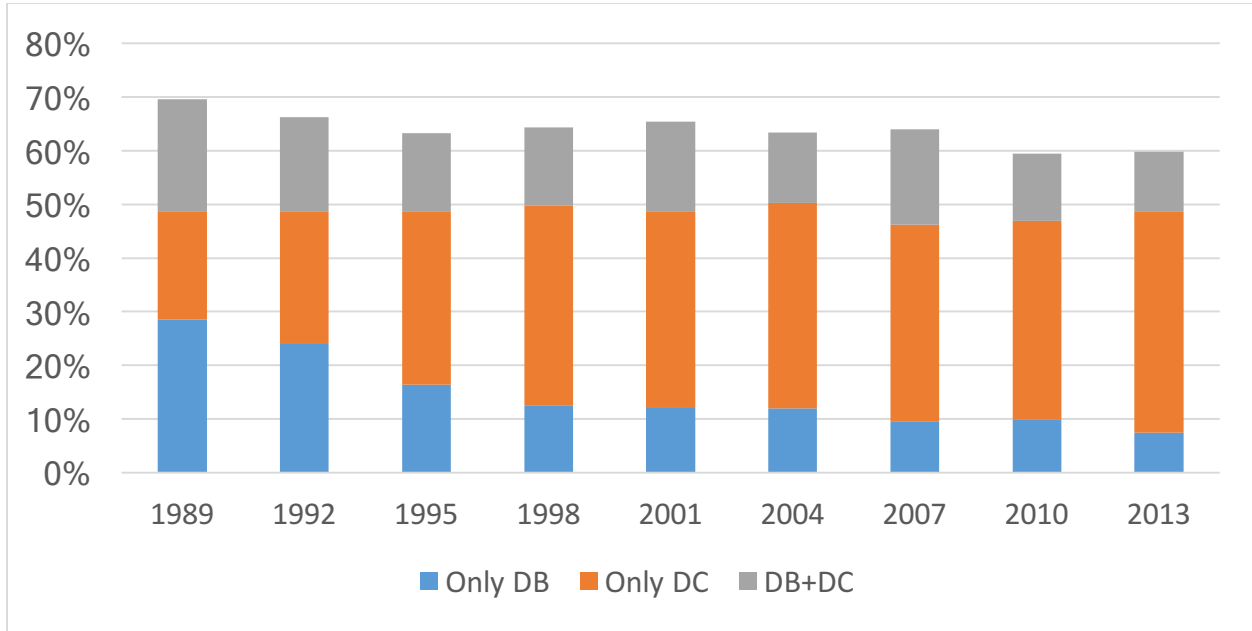
In addition, the current imputed earnings histories used to estimate SS wealth do not reflect employment shocks experienced by individual workers. All workers are currently assigned the average rate of growth to workers in the same birth-year, educational attainment, and occupation cohort, which are then applied to the worker-specific earnings of current and past job. In the future, we will incorporate shocks (zero or partial earnings years) to earnings history.



\*\*\*\*\* DRAFT \*\*\*\*\* DO NOT CITE. DO NOT CIRUCLATE \*\*\*\*\*

At this stage our retirement preparation measures also remain somewhat rudimentary. Our annuity calculations are rather simplistic and can be made more complex in ways that better reflect the actual scenarios that are faced by retirees. Also, we currently do not incorporate taxes into our analysis aside from our treatment of net value of Social Security to reflect FICA taxes.

**Figure 1. Trends in Plan Participation Among 40-59 Year Old Household Heads**



**Figure 2. Construction of earnings history for hypothetical household: 50-year old middle income earner**

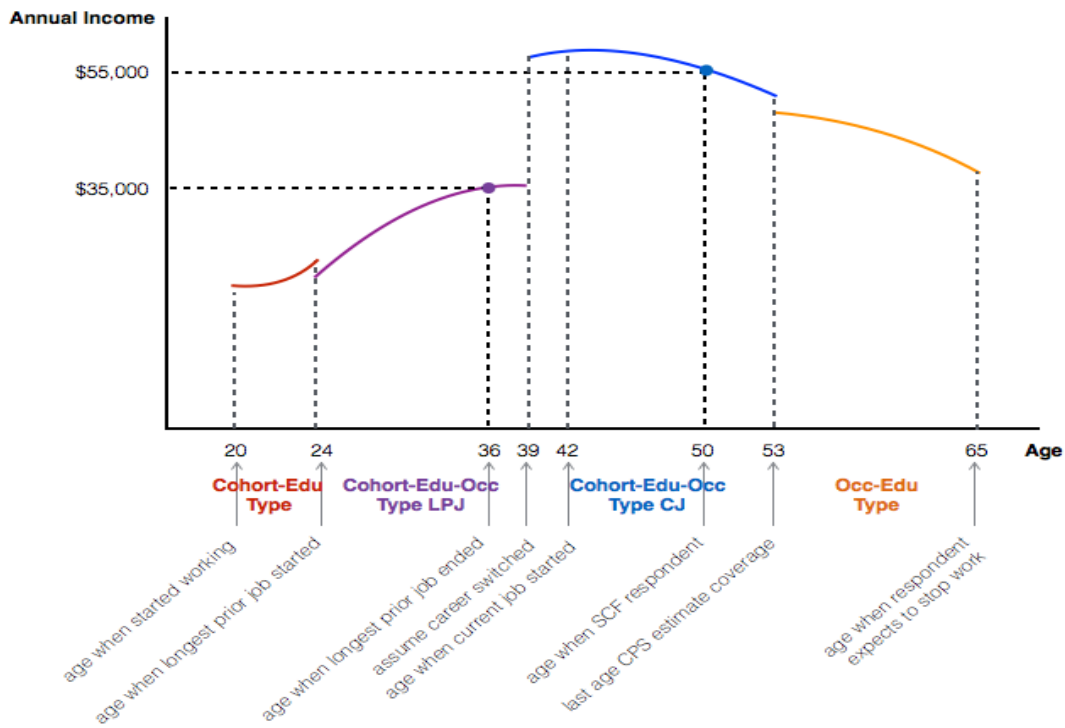


Figure 3. Mean Retirement Wealth by Type, Age Group and Year

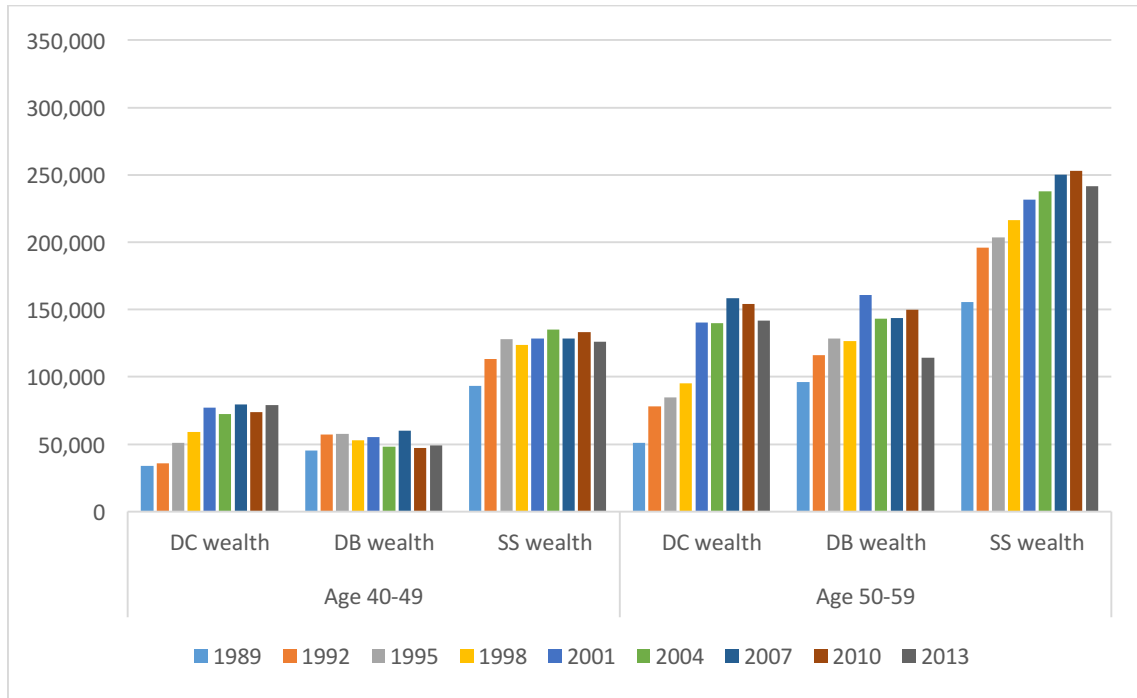


Figure 4. Mean Total Wealth by Wealth Concept, Year and Age-Group

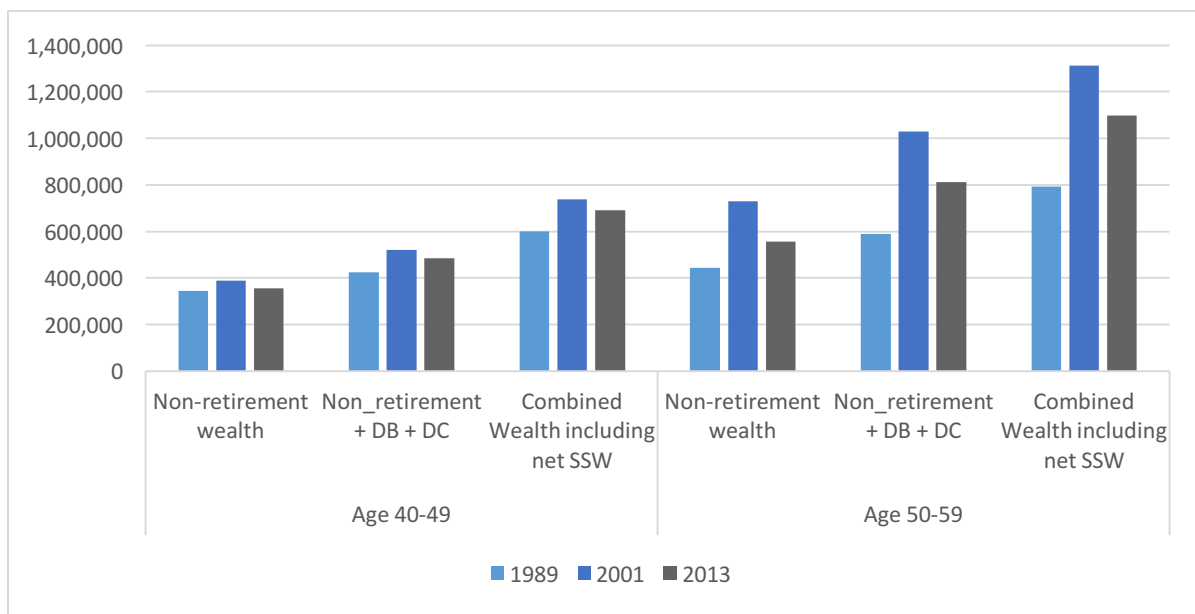
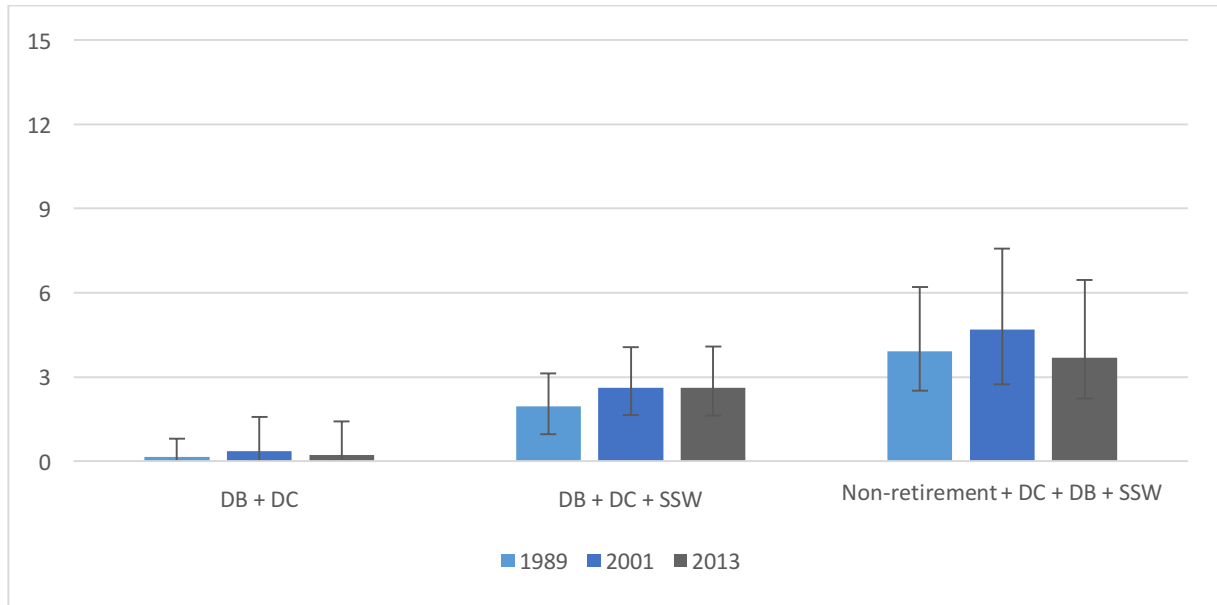


Figure 5. Wealth to Income Ratios by Year, Wealth Concept, and Age Group

5A. 40-49 year old household heads



5B. 50-59 year old household heads

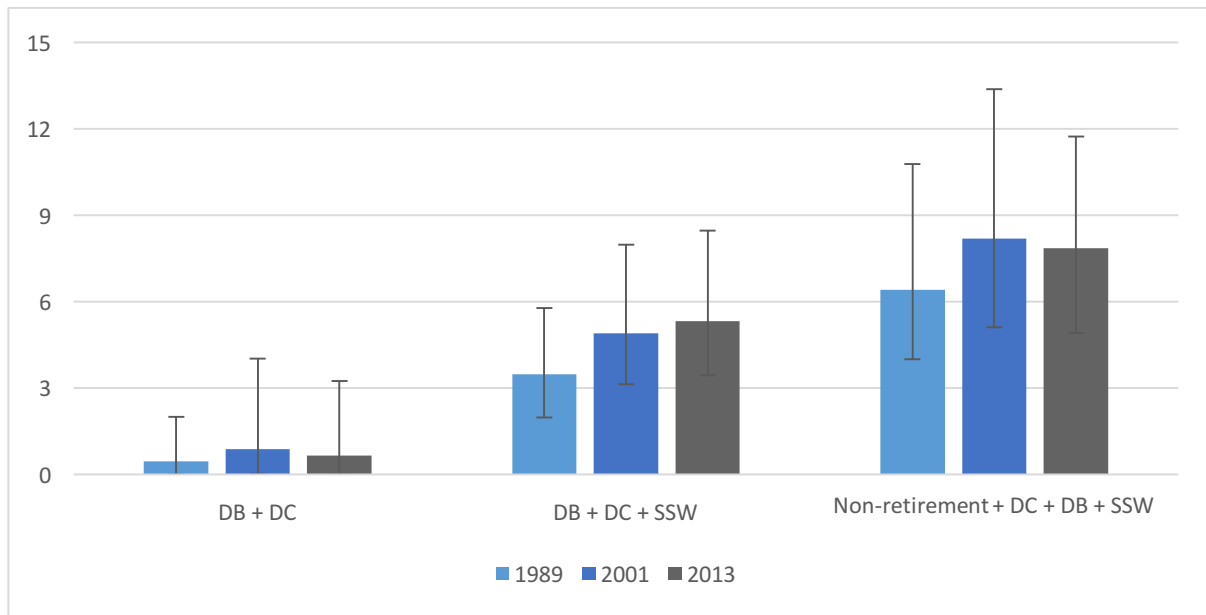
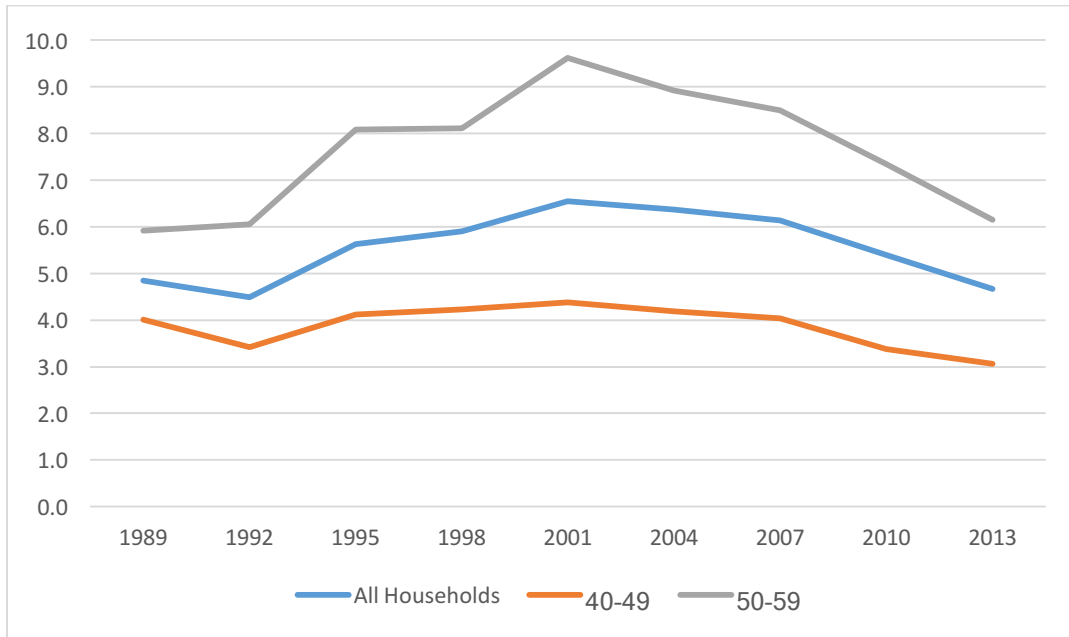


Figure 6. Annuitized Stream of Total Wealth to Poverty Ratio

6A. Mean Ratio



6B. Share of Households below 1.5 X Poverty Threshold

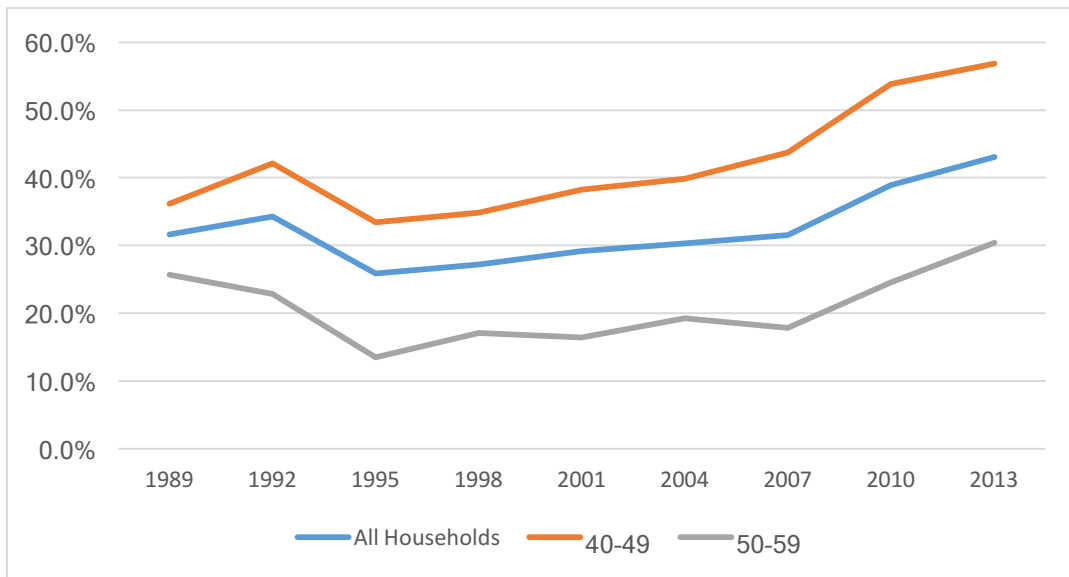


Figure 7. Distribution of Wealth by Retirement Wealth Concept, Year, Age Group, and Distribution Measure

7A. Mean/Median Ratio



7B. 90/50 Ratio

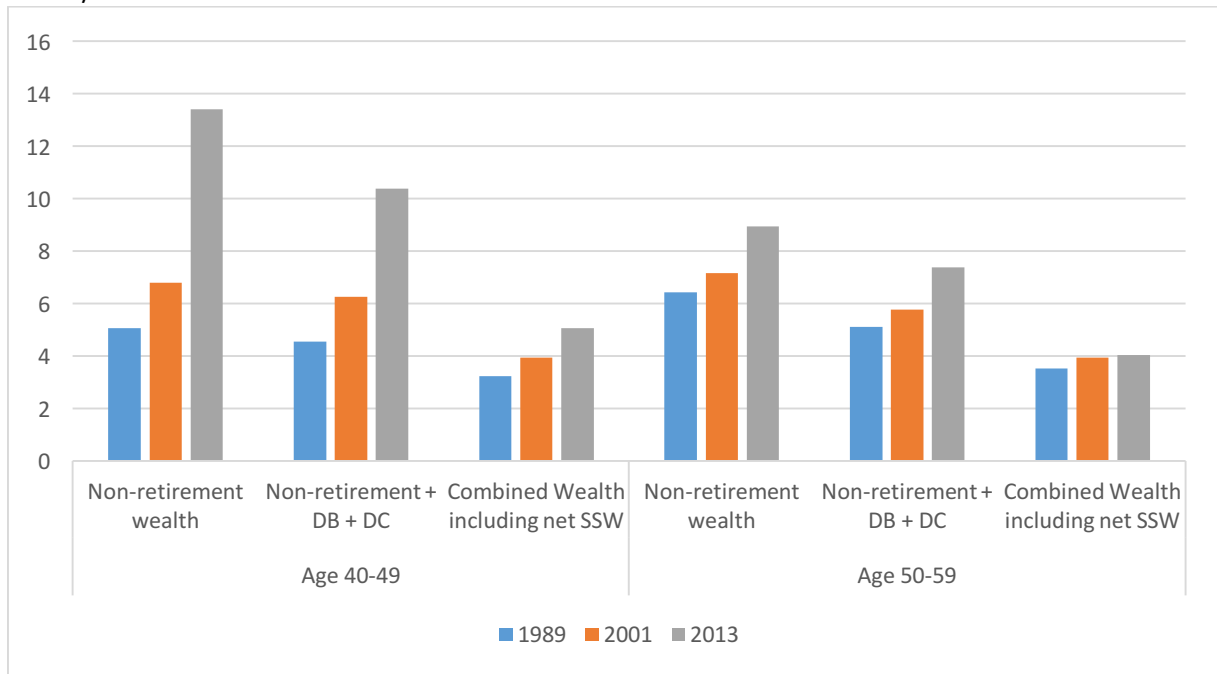
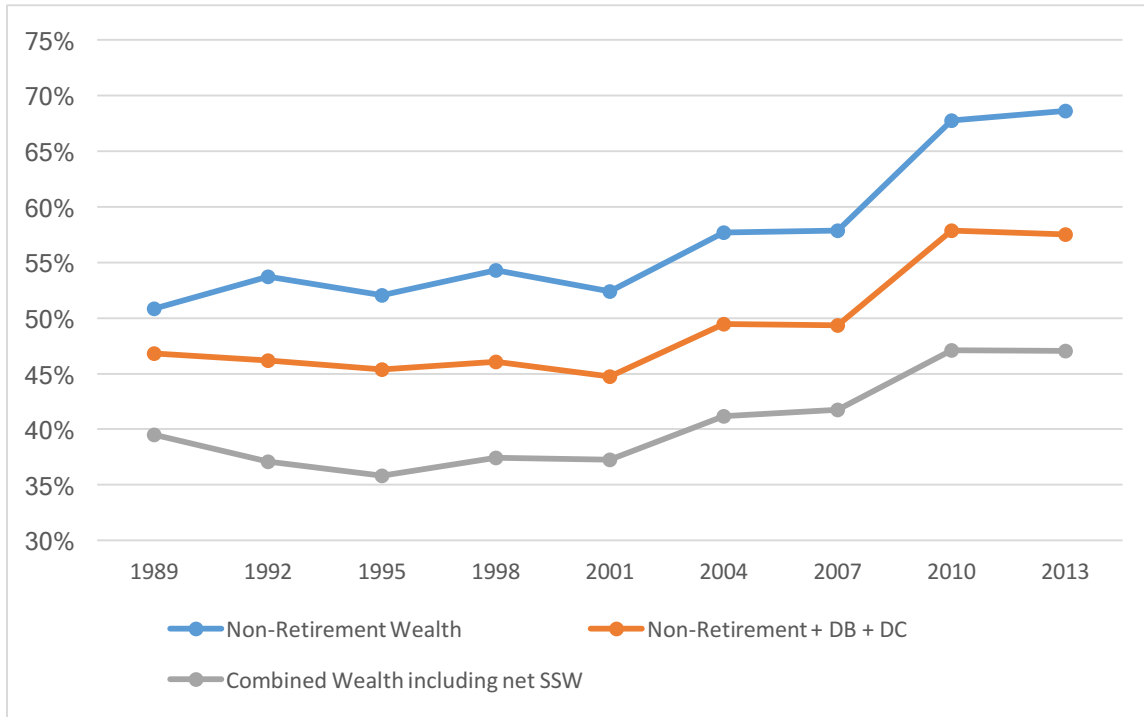


Figure 8. Top 5% Share by Age Group – Ranked by Wealth Including DC, DB Plans

8A. 40-49 year olds



8B. 50-59 year olds

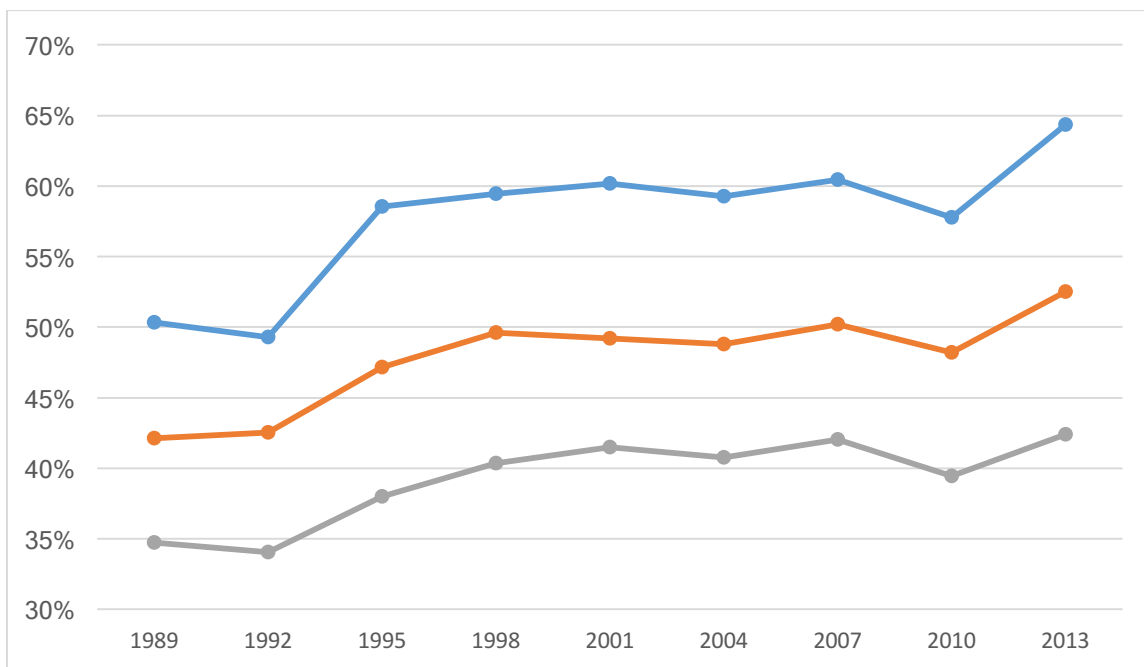
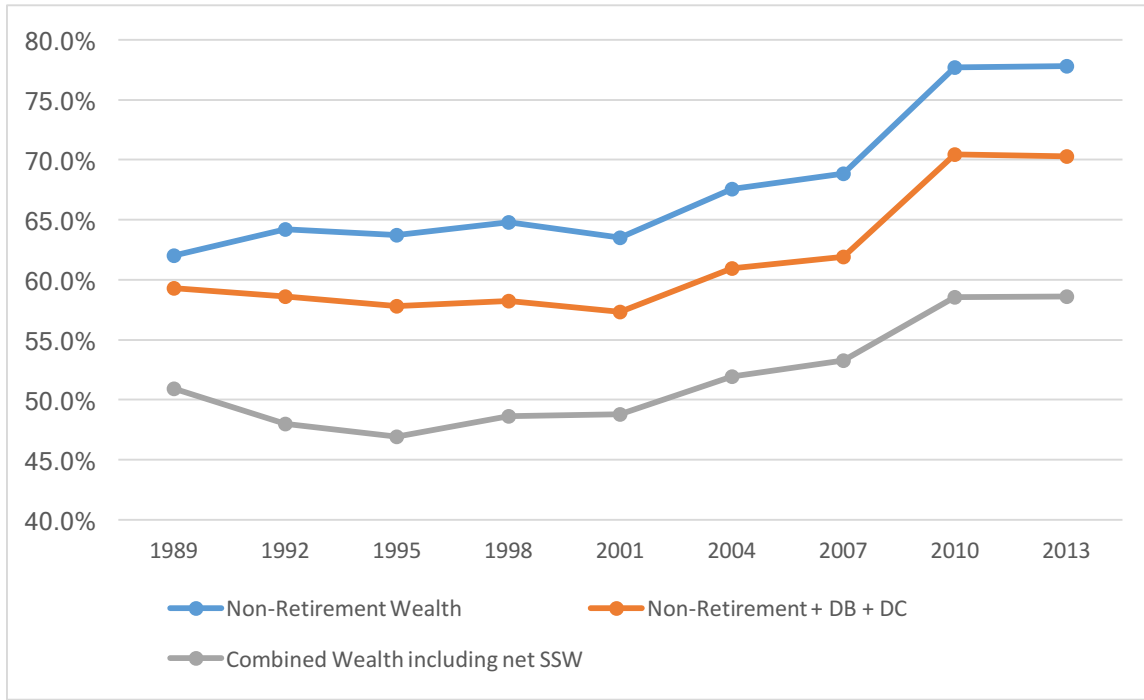


Figure 9. Top 10% Share by Age Group – Ranked by Wealth Including DC, DB Plans

9A. 40-49 year olds



9B. 50-59 year olds

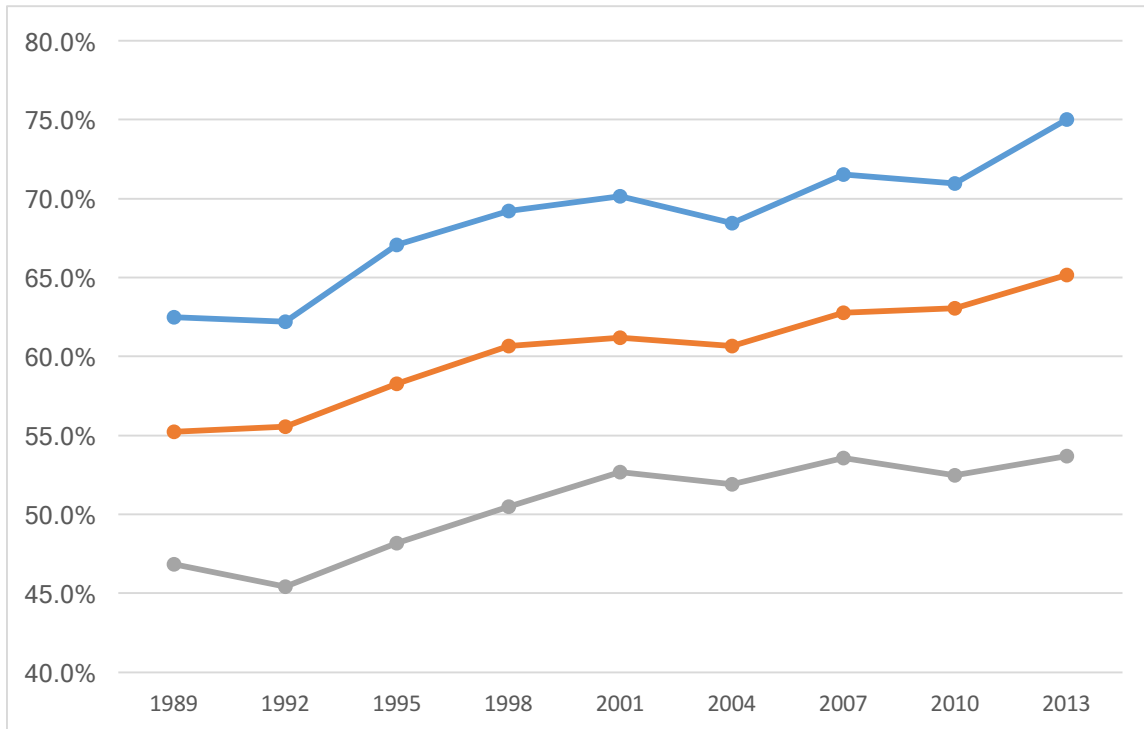




Table 1. Pension Coverage from Current Job, Household Head 40-59, Working, Household Characteristics

Year	Any Coverage	Only DB	Only DC	DB and DC
1989	70%	29%	20%	21%
1992	66%	24%	24%	18%
1995	63%	16%	32%	15%
1998	64%	12%	37%	15%
2001	65%	12%	36%	17%
2004	63%	12%	38%	13%
2007	64%	9%	37%	18%
2010	60%	10%	37%	13%
2013	60%	7%	41%	11%

Table 2. Mean Retirement wealth by type, year and age group, real 2013 \$

		1989	1992	1995	1998	2001	2004	2007	2010	2013	% change 1989 to 2013
Age 40-49	Non-retirement wealth	345,672	290,698	283,679	334,848	388,483	425,204	445,248	361,631	356,230	3.1%
	DC wealth	34,115	35,890	50,927	59,187	77,047	72,546	79,441	73,718	79,317	132.5%
	DB wealth	45,214	57,446	57,613	52,979	55,158	48,123	60,072	47,115	48,963	8.3%
	DC + DB wealth	79,329	93,336	108,540	112,166	132,205	120,669	139,513	120,833	128,280	61.7%
	Non-retirement wealth + DB + DC	425,001	384,034	392,220	447,014	520,687	545,873	584,761	482,463	484,510	14.0%
	SS wealth	93,542	113,465	128,043	123,777	128,380	135,299	128,519	133,276	126,214	34.9%
	Total Retirement (DC + DB + SS)	172,870	206,801	236,583	235,943	260,585	255,968	268,032	254,109	254,494	47.2%
	Combined Wealth	518,542	497,499	520,262	570,791	649,068	681,172	713,280	615,739	610,724	17.8%
Age 50-59	Non-retirement wealth	443,172	447,847	494,718	556,105	728,497	731,337	773,628	610,101	555,880	25.4%
	DC wealth	51,021	78,130	84,791	95,099	140,595	140,001	158,510	154,399	141,796	177.9%
	DB wealth	96,041	116,254	128,687	126,807	160,671	143,428	143,864	149,783	114,292	19.0%
	DC + DB wealth	147,063	194,384	213,478	221,906	301,266	283,429	302,374	304,183	256,088	74.1%
	Non-retirement wealth + DB + DC	590,234	642,231	708,196	778,011	1,029,762	1,014,766	1,076,002	914,284	811,967	37.6%
	SS wealth	155,399	195,958	203,345	216,172	231,678	237,949	250,113	252,885	241,596	55.5%
	Total Retirement (DC + DB + SS)	302,462	390,342	416,823	438,078	532,944	521,378	552,487	557,068	497,684	64.5%
	Combined Wealth	745,634	838,189	911,541	994,183	1,261,440	1,252,715	1,326,114	1,167,169	1,053,564	41.3%
Age 40-59	Non-retirement wealth	388,432	354,535	363,749	430,301	528,939	566,362	599,799	488,216	460,006	18.4%
	DC wealth	41,530	53,049	63,776	74,680	103,298	103,649	116,655	114,822	111,793	169.2%
	DB wealth	67,505	81,335	84,579	84,829	98,744	92,068	99,508	99,420	82,920	22.8%
	DC + DB wealth	109,034	134,384	148,354	159,509	202,042	195,718	216,163	214,242	194,713	78.6%
	Non-retirement wealth + DB + DC	497,466	488,919	512,104	589,810	730,981	762,080	815,962	702,458	654,719	31.6%
	SS wealth	120,670	146,975	156,613	163,637	171,051	182,631	185,746	194,212	186,188	54.3%
	Total Retirement (DC + DB + SS)	229,704	281,359	304,967	323,146	373,093	378,349	401,909	408,454	380,901	65.8%
	Combined Wealth	618,136	635,894	668,717	753,447	902,032	944,711	1,001,708	896,670	840,908	36.0%

Table 3. Median Retirement Wealth by Type, Year and Age Group, real 2013\$

		1989	1992	1995	1998	2001	2004	2007	2010	2013	% change 1989 to 2013
Age 40-49	Non-retirement wealth	125,086	89,118	84,296	93,135	106,420	104,928	110,029	52,299	41,650	-66.7%
	DC wealth	177	1,015	3,795	8,577	9,193	6,166	11,228	6,430	6,800	3738.7%
	DB wealth	0	0	0	0	0	0	0	0	0	-
	DC + DB wealth	11,211	11,891	17,157	27,590	26,264	21,887	22,456	13,509	14,119	25.9%
	Non-retirement wealth + DB + DC	173,057	145,015	144,184	162,121	174,820	184,470	179,646	99,654	92,407	-46.6%
	SS wealth	91,619	110,972	123,145	119,583	120,101	128,409	123,254	130,226	121,436	32.5%
	Total Retirement (DC + DB + SS)	138,832	155,365	173,526	175,827	175,909	185,287	175,484	165,881	171,502	23.5%
Combined Wealth	281,751	275,201	279,222	301,969	322,237	324,262	319,607	243,880	229,773	-18.4%	
Age 50-59	Non-retirement wealth	146,269	144,753	136,934	132,910	172,426	183,609	171,976	109,917	93,834	-35.8%
	DC wealth	1,536	4,874	7,589	8,577	15,759	13,565	31,438	12,110	11,204	629.2%
	DB wealth	47	34	0	0	0	0	0	0	0	-
	DC + DB wealth	35,412	56,867	45,536	55,322	78,793	65,739	79,718	48,101	42,713	20.6%
	Non-retirement wealth + DB + DC	242,757	241,703	253,292	261,245	339,121	360,398	353,786	237,978	209,281	-13.8%
	SS wealth	157,874	189,902	200,394	212,631	232,409	218,246	231,812	237,704	227,230	43.9%
	Total Retirement (DC + DB + SS)	222,841	286,595	285,542	310,884	346,671	342,844	363,185	339,380	323,751	45.3%
Combined Wealth	416,756	458,940	457,503	512,747	578,350	620,141	624,521	488,819	469,460	12.6%	
Age 40-59	Non-retirement wealth	133,912	107,641	102,761	109,231	129,402	135,893	136,420	75,355	64,200	-52.1%
	DC wealth	542	1,625	5,313	8,577	11,950	10,085	18,273	8,574	9,000	1559.7%
	DB wealth	0	0	0	0	0	0	0	0	0	-
	DC + DB wealth	17,339	20,037	27,322	35,738	39,396	36,994	41,624	25,721	27,432	58.2%
	Non-retirement wealth + DB + DC	195,847	189,521	176,115	188,848	235,059	238,644	258,030	153,717	142,159	-27.4%
	SS wealth	122,794	135,668	148,023	151,561	150,634	160,299	164,295	170,982	164,015	33.6%
	Total Retirement (DC + DB + SS)	164,238	190,707	204,447	221,403	230,915	230,403	242,001	235,527	232,567	41.6%
Combined Wealth	328,324	333,530	343,613	368,656	419,803	423,344	447,031	346,553	331,789	1.1%	

Table 4 Distribution of Components of Combined Wealth by Age Group, 1989, 2001, 2013

Age group:	40-49					50-59				
P10	Non-retirement Wealth	DC wealth	DB wealth	Net SSW	Combined Wealth	Non-retirement Wealth	DC wealth	DB wealth	Net SSW	Combined Wealth
1989	190	0	0	3,651	32,328	3,393	0	0	3,760	58,594
2001	2,037	0	0	44,900	70,241	3,562	0	0	84,436	124,134
2013	-13,000	0	0	34,918	46,542	-1,100	0	0	80,077	99,469
P25										
1989	24,041	0	0	46,042	123,467	56,080	0	0	81,302	184,149
2001	26,293	0	0	72,923	139,797	44,911	0	0	136,117	273,836
2013	4,989	0	0	66,130	97,930	8,675	0	0	134,898	200,110
P50										
1989	125,086	177	0	91,619	281,751	146,269	1,536	47	157,874	416,756
2001	106,420	9,193	0	120,102	322,237	172,426	15,759	0	232,409	578,350
2013	41,650	6,800	0	121,436	229,773	93,834	11,204	0	227,230	469,460
P75										
1989	288,534	18,076	31,917	149,931	497,586	323,176	45,189	116,373	238,271	788,940
2001	311,962	72,227	2,381	178,392	696,931	424,144	117,008	169,769	329,623	1,203,714
2013	177,400	80,800	0	186,207	526,630	299,550	135,000	14,055	339,172	1,001,507
P90										
1989	632,990	74,110	138,372	189,321	906,291	941,087	148,221	327,196	288,011	1,469,333
2001	722,911	219,964	223,579	237,249	1,268,884	1,233,768	372,953	579,278	388,621	2,268,966
2013	558,025	236,231	127,813	244,811	1,163,361	838,775	417,860	388,963	438,114	1,890,827

Table 5. Wealth Levels at Points of the Non-retirement + DB + DC Wealth Distribution, by Age group, 1989, 2001, and 2013

Age group:	40-49					50-59				
	AT P10 of Networth + DB + DC distribution					AT P10 of Networth + DB + DC distribution				
	Non-retirement Wealth	DC wealth	DB wealth	Net SSW	Combined Wealth	Non-retirement Wealth	DC wealth	DB wealth	Net SSW	Combined Wealth
1989	2,540	779	267	39,808	43,393	9,818	657	865	72,499	83,839
2001	4,921	705	264	63,648	69,537	9,472	439	743	134,142	144,796
2013	-6,973	2,933	110	69,255	65,326	-76	252	156	96,994	97,327
	AT P25 of Networth + DB + DC distribution					AT P25 of Networth + DB + DC distribution				
1989	33,567	2,634	2,976	84,882	124,059	65,134	5,777	3,037	127,339	201,287
2001	34,794	6,208	2,192	98,166	141,361	64,006	13,662	4,228	193,146	275,042
2013	8,968	2,259	874	92,080	104,182	18,618	7,281	2,103	191,098	219,099
	AT P50 of Networth + DB + DC distribution					AT P50 of Networth + DB + DC distribution				
1989	135,214	7,823	30,854	124,291	298,182	183,835	28,925	35,410	153,070	401,241
2001	121,032	33,006	26,467	133,199	313,704	193,881	54,672	94,451	240,068	583,073
2013	55,438	24,367	13,119	118,340	211,264	129,524	45,936	38,545	232,360	446,364
	AT P75 of Networth + DB + DC distribution					AT P75 of Networth + DB + DC distribution				
1989	285,831	19,338	86,244	88,982	480,395	324,603	65,956	192,524	215,215	798,299
2001	360,390	97,783	91,666	159,514	709,354	436,834	185,195	307,599	291,352	1,220,980
2013	202,963	99,539	62,278	161,450	526,231	308,395	181,541	203,696	305,526	999,158
	AT P90 of Networth + DB + DC distribution					AT P90 of Networth + DB + DC distribution				
1989	657,698	86,827	112,624	137,171	994,319	864,151	127,213	316,542	230,290	1,538,195
2001	726,129	206,355	185,375	173,383	1,291,242	1,236,532	325,729	514,769	321,545	2,398,576
2013	566,191	236,290	206,275	181,092	1,189,848	884,377	372,883	407,634	362,695	2,027,589

Note: Each statistics is actually calculated as the mean of the wealth concept for households (by age group and year) within +/- five percentage points of the cut point of the non-retirement + DB + DC wealth distribution. So, the values for P10 of the non-retirement + DB + DC distribution is the mean of the wealth concept for households between the 5th and 15th percentiles of the non-retirement + DB + DC distribution.

Table 6A. Distribution of Wealth to Income Ratio by Wealth Concept, Year, and Age-Group

6A. Age 40-49									
Panel A. Private Pension Wealth to Income Ratio									
	1989	1992	1995	1998	2001	2004	2007	2010	2013
P25	0	0	0	0	0	0	0	0	0
P50	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.2
Mean	0.8	1.1	1.3	1.5	1.3	1.1	1.2	1.1	1.2
P75	0.8	1.2	1.4	1.4	1.6	1.3	1.5	1.2	1.4
P90	1.7	2.7	3.2	4.2	3.7	2.9	3.8	3.3	3.0
Mean/Median	5.3	6.4	4.7	4.3	3.8	3.4	4.1	5.0	5.6
P90/P50	11.1	15.1	11.8	11.9	10.6	9.4	12.6	14.8	13.7
Panel B. Retirement Wealth to Income Ratio									
P25	1.0	1.5	1.8	1.6	1.6	1.6	1.7	1.7	1.6
P50	2.0	2.5	2.8	2.6	2.6	2.6	2.7	2.7	2.6
Mean	2.6	3.7	4.0	3.6	3.4	3.3	3.4	3.6	3.6
P75	3.1	3.9	4.2	4.2	4.1	4.0	4.0	4.3	4.1
P90	4.7	6.2	6.9	6.7	6.4	6.0	6.8	6.6	6.6
Mean/Median	1.3	1.5	1.4	1.4	1.3	1.3	1.2	1.3	1.4
P90/P50	2.4	2.5	2.5	2.6	2.4	2.3	2.5	2.5	2.5
Panel C. Total Wealth to Income Ratio									
P25	2.5	2.6	3.0	2.9	2.7	2.9	2.9	2.4	2.2
P50	3.9	4.4	4.6	4.5	4.7	4.6	4.6	4.0	3.7
Mean	5.5	6.8	6.6	6.4	6.4	6.2	6.2	5.9	5.7
P75	6.2	6.7	7.4	7.2	7.6	7.1	7.9	6.9	6.5
P90	10.4	11.1	12.2	11.5	11.8	11.0	11.5	10.8	10.6
Mean/Median	1.4	1.6	1.4	1.4	1.4	1.4	1.4	1.5	1.6
P90/P50	2.6	2.6	2.6	2.6	2.5	2.4	2.5	2.7	2.9

Table 6B. Distribution of Wealth to Income Ratio by Wealth Concept, Year, and Age-Group

6B. Age 50-59									
Panel A. Private Pension Wealth to Income Ratio									
	1989	1992	1995	1998	2001	2004	2007	2010	2013
P25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P50	0.5	0.6	0.7	0.7	0.9	0.9	1.0	0.7	0.6
Mean	1.8	2.2	2.7	2.6	2.7	2.3	2.7	2.5	2.3
P75	2.0	3.1	3.7	3.5	4.0	3.4	3.9	3.5	3.2
P90	4.6	5.7	7.6	7.6	7.7	7.0	8.1	8.0	7.2
Mean/Median	3.9	3.4	3.6	3.7	3.1	2.7	2.8	3.8	3.6
P90/P50	10.0	9.0	10.3	10.8	8.7	8.2	8.4	12.2	11.1
Panel B. Retirement Wealth to Income Ratio									
P25	2.0	3.0	3.1	3.1	3.1	3.0	3.4	3.5	3.5
P50	3.5	4.7	4.9	5.0	4.9	4.8	5.2	5.5	5.3
Mean	4.8	6.7	6.7	6.5	6.5	6.3	6.7	6.9	6.8
P75	5.8	7.6	7.8	8.1	8.0	8.1	8.5	8.7	8.5
P90	9.9	11.8	13.3	13.2	13.3	12.1	13.3	13.6	13.7
Mean/Median	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3
P90/P50	2.8	2.5	2.7	2.6	2.7	2.5	2.6	2.5	2.6
Panel C. Total Wealth to Income Ratio									
P25	4.0	4.9	5.1	5.2	5.1	5.2	5.4	5.1	4.9
P50	6.4	8.3	8.1	7.8	8.2	8.4	8.6	8.2	7.9
Mean	8.8	11.5	10.5	10.6	11.2	11.4	11.0	10.8	10.4
P75	10.8	12.3	12.4	13.5	13.4	12.8	13.5	13.3	11.7
P90	17.3	19.1	20.8	20.4	22.4	21.8	21.5	20.3	20.1
Mean/Median	1.4	1.4	1.3	1.4	1.4	1.4	1.3	1.3	1.3
P90/P50	2.7	2.3	2.6	2.6	2.7	2.6	2.5	2.5	2.6

Table 7. Annualized wealth stream to poverty ratio, Mean and shares below poverty, by age group

Panel A. All Households (40-59)									
	1989	1992	1995	1998	2001	2004	2007	2010	2013
Mean Income/Poverty Ratio:									
Annuitized Total Wealth	4.8	4.5	5.6	5.9	6.5	6.4	6.1	5.4	4.7
Annuitized Wealth Less Housing	4.2	4.0	5.1	5.4	5.9	5.5	5.3	4.9	4.3
Share of Households below Multiple of Poverty Threshold									
1 X Poverty	21.5%	22.2%	16.2%	17.1%	18.9%	19.3%	21.7%	26.7%	31.2%
1.5 X Poverty	31.6%	34.3%	25.9%	27.2%	29.2%	30.3%	31.5%	38.9%	43.1%
2 X Poverty	41.5%	43.2%	37.0%	35.5%	37.2%	38.9%	39.6%	48.2%	52.2%
Panel B. Age 40-49									
Mean Income/Poverty Ratio:									
Annuitized Total Wealth	4.0	3.4	4.1	4.2	4.4	4.2	4.0	3.4	3.1
Annuitized Wealth Less Housing	3.5	3.0	3.7	3.8	3.9	3.6	3.4	3.1	2.8
Share of Households below Multiple of Poverty Threshold									
1 X Poverty	25.7%	28.6%	20.6%	22.5%	25.7%	27.2%	32.0%	39.5%	44.2%
1.5 X Poverty	36.2%	42.1%	33.5%	34.8%	38.2%	39.9%	43.7%	53.8%	56.8%
2 X Poverty	47.6%	51.7%	46.7%	44.2%	47.0%	49.2%	51.9%	63.5%	66.3%
Panel C. Age 50-59									
Mean Income/Poverty Ratio:									
Annuitized Total Wealth	5.9	6.1	8.1	8.1	9.6	8.9	8.5	7.3	6.1
Annuitized Wealth Less Housing	5.2	5.4	7.4	7.4	8.7	7.8	7.4	6.6	5.6
Share of Households below Multiple of Poverty Threshold									
1 X Poverty	16.1%	12.9%	9.0%	10.1%	9.1%	10.1%	10.2%	14.4%	19.2%
1.5 X Poverty	25.7%	22.8%	13.5%	17.0%	16.4%	19.2%	17.8%	24.6%	30.4%
2 X Poverty	33.8%	30.7%	21.2%	24.1%	23.3%	26.7%	25.9%	33.4%	39.1%



Table 8. Mean/Median and P90/P50 Ratios by Wealth Concept, Age Group and Year

	Mean/Median			90/50		
	1989	2001	2013	1989	2001	2013
Age 40-49						
Non-retirement wealth	2.8	3.7	8.6	5.1	6.8	13.4
Wealth with Private Pensions	2.5	3.0	5.2	4.6	6.3	10.4
- Total Wealth Net SS	1.8	2.0	2.7	3.2	3.9	5.1
Age 50-59						
Non-retirement wealth	3.0	4.2	8.9	6.4	7.2	8.9
Wealth with Private Pensions	2.4	3.0	3.9	5.1	5.8	7.4
- Total Wealth Net SS	1.8	2.2	2.2	3.5	3.9	4.0
Age 40-59						
Non-retirement wealth	2.9	4.1	7.2	5.1	6.8	11.0
Wealth with Private Pensions	2.5	3.1	4.6	5.2	6.0	9.0
- Total Wealth Net SS	1.9	2.1	2.5	3.6	4.0	4.9

Table 9. Top Shares

Top 10% share				Top 10% share			
	Age: 40-49				Age: 50-59		
	Non-Retirement Wealth	Wealth with Private Pension	Combined Wealth		Non-Retirement Wealth	Wealth with Private Pension	Combined Wealth
1989	62.0%	59.3%	50.9%	1989	62.5%	55.3%	46.8%
1992	64.2%	58.6%	48.0%	1992	62.2%	55.6%	45.4%
1995	63.7%	57.8%	46.9%	1995	67.1%	58.3%	48.2%
1998	64.8%	58.2%	48.6%	1998	69.2%	60.7%	50.5%
2001	63.5%	57.3%	48.8%	2001	70.2%	61.2%	52.7%
2004	67.6%	61.0%	51.9%	2004	68.4%	60.7%	51.9%
2007	68.8%	61.9%	53.3%	2007	71.5%	62.8%	53.6%
2010	77.7%	70.4%	58.5%	2010	70.9%	63.1%	52.5%
2013	77.8%	70.3%	58.6%	2013	75.0%	65.2%	53.7%
top 5% Share				top 5% Share			
	Age: 40-49				Age: 50-59		
	Non-Retirement Wealth	Wealth with Private Pension	Combined Wealth		Non-Retirement Wealth	Wealth with Private Pension	Combined Wealth
1989	50.8%	46.8%	39.5%	1989	50.3%	42.1%	34.8%
1992	53.7%	46.2%	37.1%	1992	49.3%	42.5%	34.0%
1995	52.0%	45.4%	35.8%	1995	58.5%	47.2%	38.0%
1998	54.3%	46.0%	37.4%	1998	59.5%	49.6%	40.4%
2001	52.4%	44.7%	37.2%	2001	60.2%	49.2%	41.5%
2004	57.7%	49.5%	41.2%	2004	59.3%	48.8%	40.8%
2007	57.8%	49.3%	41.7%	2007	60.5%	50.2%	42.0%
2010	67.8%	57.9%	47.1%	2010	57.8%	48.2%	39.4%
2013	68.6%	57.5%	47.0%	2013	64.3%	52.5%	42.4%

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## References/Citations

- Banks, James, Richard Blundell, and James P. Smith (2003). "Financial Wealth Inequality in the United States and Great Britain." *The Journal of Human Resources*, vol. 38, (2), pp. 241-279.
- Bernheim, B. Douglas (1992). "Is the Baby Boom Generation Preparing Adequately for Retirement? Technical Report," unpublished, Merrill Lynch.
- Biggs, Andrew G., and Glenn R. Springstead (2008). "Alternate Measures of Replacement Rates for Social Security Benefits and Retirement Income." *Social Security Bulletin*, vol. 68 (2), pp. 1-19.
- Bricker, Jesse, Lisa J. Dettling, Alice Henriques, Joanne W. Hsu, Kevin B. Moore, John Sabelhaus, Jeffrey Thompson, and Richard A. Windle (2014). "Changes in U.S. Family Finances from 2010 to 2013: Evidence from the Survey of Consumer Finances," *Federal Reserve Bulletin*, Vol. 100, no. 4.
- Bricker, Jesse, and Gary V. Engelhardt (2014). "A Test for Selection in Matched Administrative Earnings Data," *Journal of Economic and Social Measurement*, vol. 39, no. 4, pp. 247-255.
- Bricker, Jesse, Alice Henriques, Jacob Krimmel, and John Sabelhaus (2016). "Measuring Income and Wealth at the Top Using Administrative and Survey Data," *Brookings Papers on Economic Activity*, Spring, pp. 261-321.
- Devlin-Foltz, Sebastian, Alice Henriques, and John Sabelhaus (2016). "Is the U.S. Retirement System Contributing to Rising Wealth Inequality?" *The Russell Sage Foundation Journal of the Social Sciences*, vol. 2, no. 6, pp. 59-85.
- Engen, Eric M., William G. Gale and Cori E. Uccello (1999). "The Adequacy of Household Saving." *Brookings Papers on Economic Activity*, vol. 2, pp. 65-187.
- Gustman, Alan L. and Thomas L. Steinmeier (1999). "Effects of Pensions on Savings: Analysis with Data from the Health and Retirement Study." *Carnegie-Rochester Series on Public Policy*. Vol. 50, pp. 271-324.

Haveman, Robert, Karen Holden, Barbara Wolfe and Andrei Romanov (2006). "The Sufficiency of Retirement Savings: A Comparison of Two Cohorts of Retired Workers at the Time of Retirement," La Follette School Working Paper. 2006-019, <http://digital.library.wisc.edu/1793/36278>.

Hurd, Michael D. and Susann Rohwedder (2011). "Economic Preparation for Retirement" in David A. Wise, ed. *Investigations in the Economics of Aging*. University of Chicago Press, pp 77-113.

Internal Revenue Service, 1992, Individual Income Tax Returns, 1990 Internal Revenue Service, United States.

Juster, F. Thomas, James P. Smith, and Frank P. Stafford (1999). "The Measurement and Structure of Household Wealth." *Labour Economics*, vol. 6 (2), pp. 253-275.

Keister Lisa A, and Stephanie Moller (2000). "Wealth Inequality in the United States." *Annual Review of Sociology*, vol. 26, pp. 63-81.

Kennickell, Arthur B. (1999). "Revisions to the SCF Weighting Methodology: Accounting for Race/Ethnicity and Homeownership." FRB Working Paper, Washington: Board of Governors of the Federal Reserve System.

Kennickell, Arthur B. (2006). "Currents and Undercurrents: Changes in the Distribution of Wealth, 1989-2004," Finance and Economics Discussion Series. Washington: Board of Governors of the Federal Reserve System, November, <https://www.federalreserve.gov/pubs/feds/2006/200613/200613pap.pdf>.

Kennickell, Arthur B. and Annika E. Sundén (1997). "Pensions, Social Security, and the Distribution of Wealth (1997). Finance and Economics Discussion Series. Washington: Board of Governors of the Federal Reserve System, October, <https://www.federalreserve.gov/pubs/feds/1997/199755/199755pap.pdf>

Love, David A., Paul A. Smith and Lucy C. Mcnair (2008). "A New Look at the Wealth Adequacy of Older U.S. Households." *Review of Income and Wealth*. vol. 54 (4), pp. 616-642.

- Martha Starr-McCluer and Annika Sunden, (1999). "Workers' Knowledge of Their Pension Coverage: A Reevaluation" in John C. Haltiwanger, Julia I. Lane, James.R. Spletzer, Jules J.M. Theeuwes, Kenneth R. Troske, eds. *The Creation and Analysis of Employer-Employee Matched Data (Contributions to Economic Analysis, Volume 241)*. Emerald Group Publishing Limited, pp.469 - 583
- Munnell, Alicia H., Natalia Orlova, and Anthony Webb (2013). "How Important is Asset Allocation to Americans' Financial Retirement Security?." In Olivia S. Mitchell and Kent Smetters, eds., *The Market for Retirement Financial Advice*. New York: Oxford University Press, pp. 89-106.
- Munnell, Alicia H., Matthew S. Rutledge, and Anthony Webb (2014). "Are Retirees Falling Short? Reconciling the Conflicting Evidence." Center for Retirement Research at Boston College 2014-16, November, <http://crr.bc.edu/working-papers/are-retirees-falling-short-reconciling-the-conflicting-evidence/>.
- Munnell, Alicia H., Anthony Webb and Luke Delorme (2006). "A New National Retirement Risk Index." *Issue in Brief 48*, Center for Retirement Research at Boston College, June, <http://crr.bc.edu/briefs/a-new-national-retirement-risk-index/>.
- Munnell, Alicia H., Matthew S. Rutledge, and Anthony Webb (2014). "Are Retirees Falling Short? Reconciling the Conflicting Evidence." Center for Retirement Research at Boston College 2014-16, November, <http://crr.bc.edu/working-papers/are-retirees-falling-short-reconciling-the-conflicting-evidence/>.
- Pfeffer, Fabian T., Robert F. Schoeni, Arthur Kennickell and Patrica Andreski (2016). "Measuring Wealth and Wealth Inequality: Comparing two U.S. Surveys." *Journal of Economic and Social Measurement*, vol. 41, pp. 103-120.
- Quadrini, Vincenzo (1999). "The Importance of Entrepreneurship for Wealth Concentration and Mobility." *The Review of Income and Wealth*. vol. 45, (1), pp. 1-19.
- Saez, Emmanuel, and Gabriel Zucman. 2016. "Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data." *Quarterly Journal of Economics*, vol. 131(2), pp. 519-78.
- Scholz, John Karl, Ananth Seshadari and Surachai Khitatrakun (2006). "Are Americans Saving 'Optimally' for Retirement?." *Journal of Political Economy*, vol. 114 (4), pp. 607-643.

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SSA, 2016. *Income of the aged chartbook, 2014*

Wilson, O. H., and J. William J. Smith, 1983, "Access to Tax Records for Statistical Purposes," Proceedings of the Section on Survey Research Methods, American Statistical Association, pp. 595-601.

Wolff, Edward N. (1995). *Top Heavy. A study of the increasing inequality of wealth in America*. New York: Twentieth Century Fund Press.

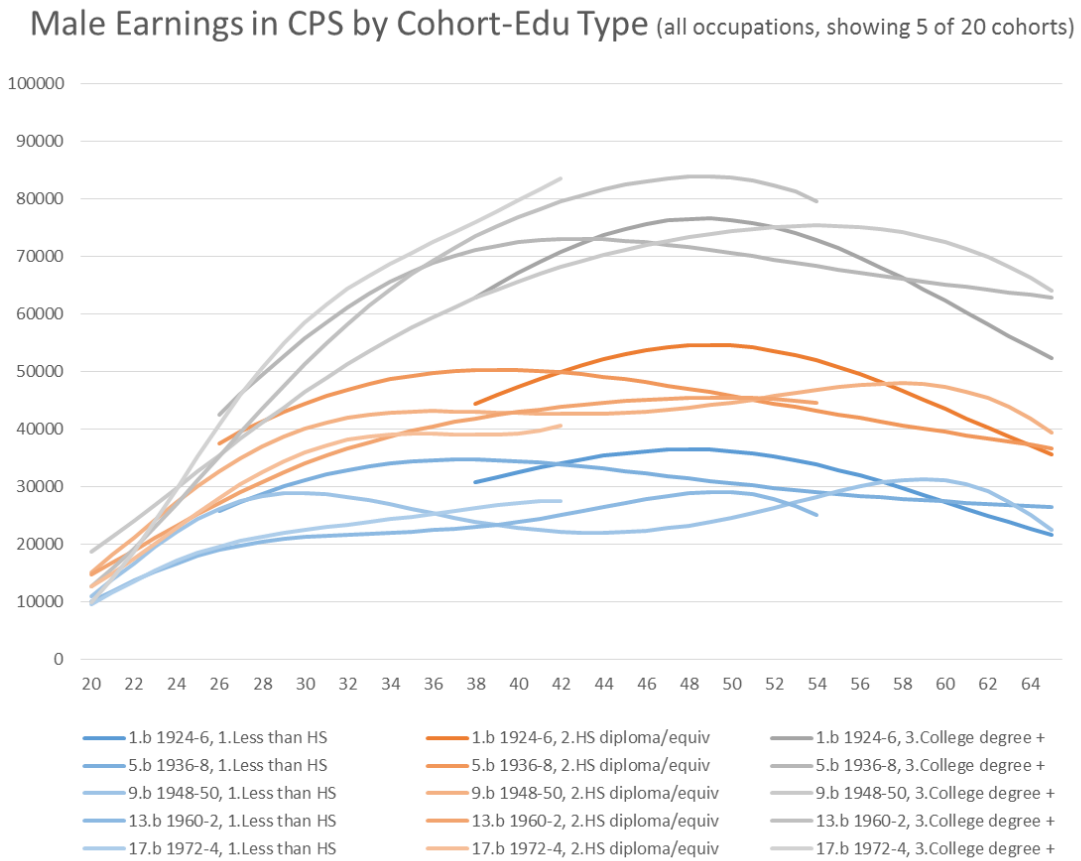
Wolff, Edward N. (2007). "The Retirement Wealth of the Baby Boom Generation." *Journal of Monetary Economics*, vol. 54, pp. 1-40.

Wolff, Edward N. (2015). "U.S. Pensions in the 2000's: The Lost Decade?." *Review of Income and Wealth*, vol. 61 (4), pp. 599-629.

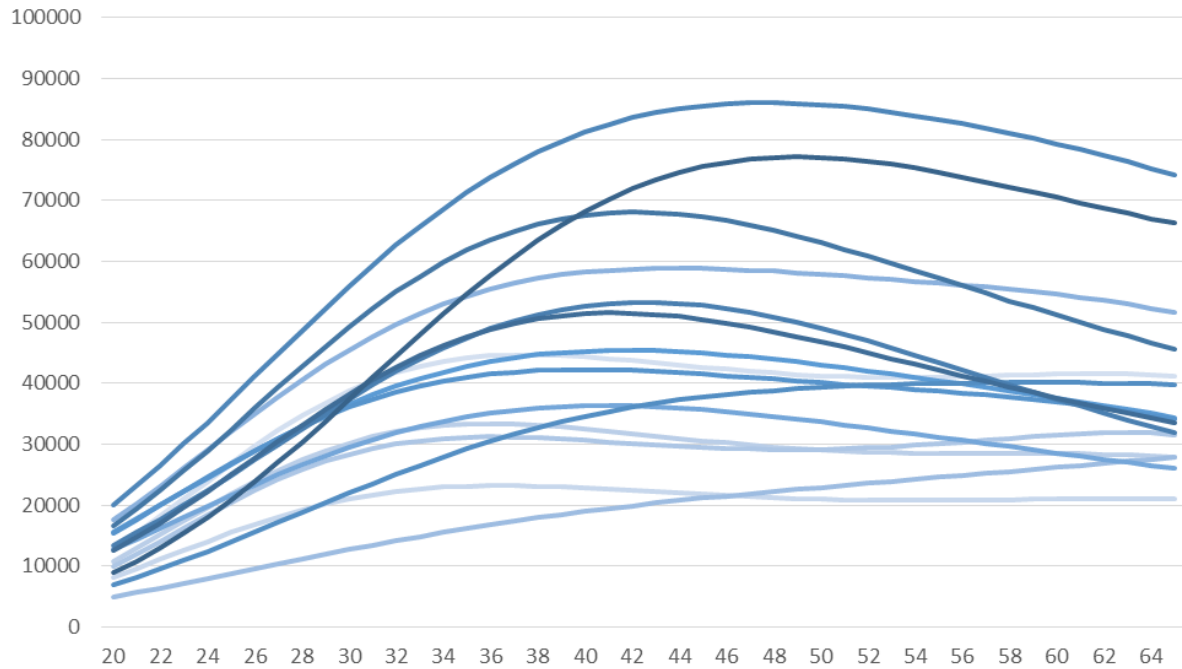
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## Appendix

### Graphs for Appendix:



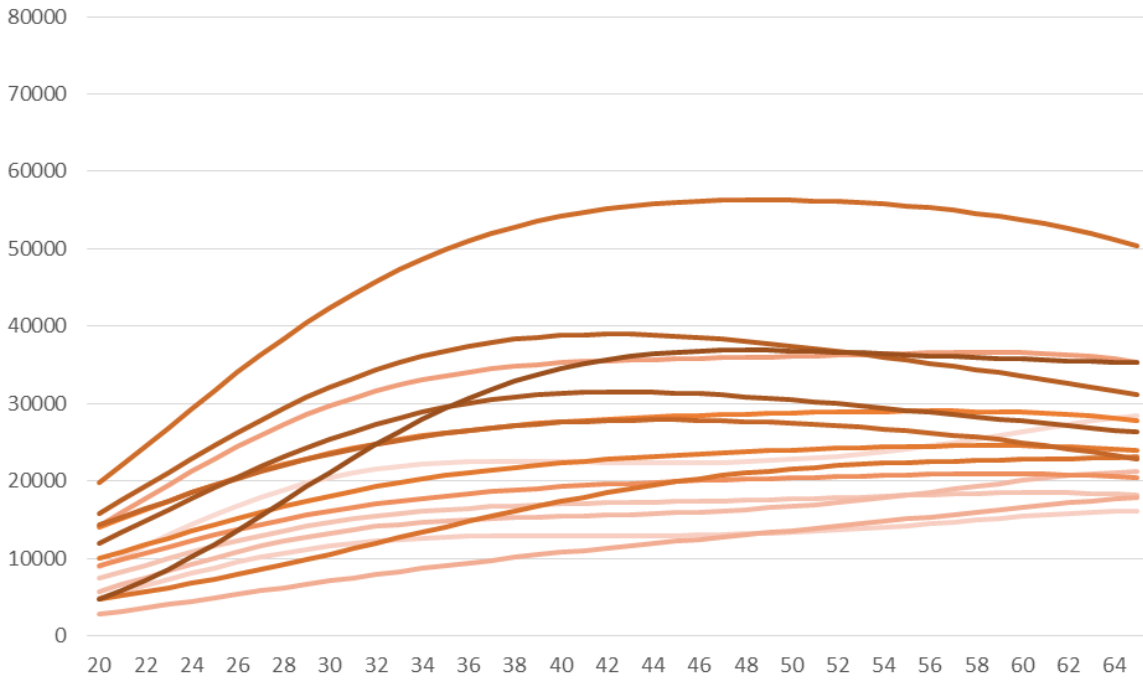
### Male Earnings in CPS by Edu-Occ Type (all birth cohorts)



- 1. Less than HS, 1. Mgt., Prof., related
- 1. Less than HS, 2. Service
- 1. Less than HS, 3. Sales and Office
- 1. Less than HS, 4. Nat. rec., Constr., Maint., Prod., Trans., Material Moving
- 1. Less than HS, 5. Self-Employed, all occupations
- 2. HS diploma/equiv, 1. Mgt., Prof., related
- 2. HS diploma/equiv, 2. Service
- 2. HS diploma/equiv, 3. Sales and Office
- 2. HS diploma/equiv, 4. Nat. rec., Constr., Maint., Prod., Trans., Material Moving
- 2. HS diploma/equiv, 5. Self-Employed, all occupations
- 3. College degree +, 1. Mgt., Prof., related
- 3. College degree +, 2. Service
- 3. College degree +, 3. Sales and Office
- 3. College degree +, 4. Nat. rec., Constr., Maint., Prod., Trans., Material Moving
- 3. College degree +, 5. Self-Employed, all occupations



### Female Earnings in CPS by Edu-Occ Type (all birth cohorts)



- 1.Less than HS, 1.Mgt., Prof., related, gender
- 1.Less than HS, 2.Service, gender
- 1.Less than HS, 3.Sales and Office, gender
- 1.Less than HS, 4.Nat. rec., Constr., Maint., Prod., Trans., Material Moving, gender
- 1.Less than HS, 5.Self-Employed, all occupations, gender
- 2.HS diploma/equiv, 1.Mgt., Prof., related, gender
- 2.HS diploma/equiv, 2.Service, gender
- 2.HS diploma/equiv, 3.Sales and Office, gender
- 2.HS diploma/equiv, 4.Nat. rec., Constr., Maint., Prod., Trans., Material Moving, gender
- 2.HS diploma/equiv, 5.Self-Employed, all occupations, gender
- 3.College degree +, 1.Mgt., Prof., related, gender
- 3.College degree +, 2.Service, gender
- 3.College degree +, 3.Sales and Office, gender
- 3.College degree +, 4.Nat. rec., Constr., Maint., Prod., Trans., Material Moving, gender
- 3.College degree +, 5.Self-Employed, all occupations, gender