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Wealth Concentration in the United States Using an Expanded Measure of Net Worth

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Abstract:
Defined benefit (DB) pensions and Social Security are two important resources for financing retirement in the United States. However, these illiquid, non-market forms of wealth are typically excluded from measures of net worth. To the extent that these broadly held resources substitute for savings, measures of wealth inequality that do not account for DB pensions and Social Security may be overstated. This paper develops an alternative, expanded wealth concept, augmenting precise net worth data from the Survey of Consumer Finances with estimates of DB pension and expected Social Security wealth. We use this expanded wealth concept to explore the concentration of wealth among households aged 40 to 59 and find that (1) including DB pension and Social Security results in markedly lower measures of wealth concentration and that (2) trends toward higher wealth inequality over time, while moderated, are still present.

JEL Classifications: D14, D31, D63, G51, I31, J15
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1. Introduction

Wealth and its distribution across households are sensitive to the elements of net worth that are measured. Because components of wealth—savings accounts, housing, stocks, and retirement plans, for example—have very distinct distributions, any inclusion or exclusion of certain components carries different implications for our understanding of wealth inequality. Defined benefit (DB) pensions, provided voluntarily by employers, and Social Security—the national public pension program—are two important resources in the United States for financing retirement that are often excluded from data due to challenges in measuring these illiquid, non-market forms of wealth. To the extent that (a) financing retirement years is a significant motivator for households to save and (b) the broad availability of DB pensions and Social Security in retirement substitute for other forms of savings, accounting for only market wealth results in incomplete measures of wealth and representations of household wealth concentration. In this paper, we estimate an expanded measure of wealth that includes estimates of non-market wealth from both employer-sponsored DB pensions and future Social Security for those just beginning the last half of their working life and show the impact that using this broad measure of wealth has on estimates of wealth inequality in the United States, as well as trends over time. We further illustrate the impact Social Security has on these measures by simulating distributions under a scenario in which expected future Social Security Trust Fund shortfalls are addressed through a reduction in benefit payouts.

One reason that the illiquid and non-market resources of DB pensions and Social Security are typically excluded from studies of wealth concentration is that they are not directly available in household-level survey data. Our work addresses this issue by taking data from the Survey of Consumer Finances (SCF), estimating work histories to predict future Social Security income streams, and combining these results with estimated accrued DB assets and other market wealth holdings to form an expanded wealth measure. We look at households aged 40 to 59, who are building up to peak wealth accumulation before drawing down assets in retirement.[1] Our estimates show that the value of DB pensions and Social Security are significant relative to other forms of wealth—throughout the wealth distribution but especially at the lower half of the wealth distribution. Indeed, we find that, even for the median household, the present value of DB pensions and Social Security benefits accounts for more than half of all wealth. With respect to their effects on the distribution of wealth, we find that (1) including DB pension and Social Security wealth results in markedly lower measures of wealth concentration, and (2) trends toward higher wealth inequality over time, while moderated, are still present. In particular, the "90/50 ratio"—the ratio of wealth held by those at the 90th percentile of wealth to those at the 50th percentile—is reduced by nearly half for the 50–59 age group (from 13.4 to 6.8 in 2019) and for the 40–49 age group (10.7 to 6.4) when we include the estimated value of Social Security. The "50/10 ratio" declines even more with the inclusion of Social Security; for 2019, the ratio falls from 13.1 to 4.3 among those aged 40 to 49 and from 21.3 to 4.2 for the 50–59 age group. The share of wealth held by the "top 5 percent" drops from about 72 percent down to 51

[1] We focus on this group of young savers for several reasons. In related work (Jacobs et al. 2020), we use the expanded wealth concept to explicitly explore retirement income adequacy in a population that is approaching, but not yet at, the age of retirement. Also, the estimation of future work histories is less dependent on assumptions, as respondents who are 40 to 59 have already spent significant time in the workforce, reducing the assumptions necessary to most accurately predict future labor force participation. Finally, this approach has the added benefit of reducing the impact of evolving age composition of households, which complicates interpretation of inequality trends.

percent when defined contribution (DC) plan and DB pension wealth are added to non-retirement wealth; it falls even further, to 45 percent, when Social Security benefits for those aged 40 to 59 are included. The inclusion of each measure, however, has a somewhat different effect: Social Security decreases wealth concentration "at the top," whether we look at the top 5 percent's share of wealth or the 90/50 ratio; DB decreases the top 5 percent's share, but in more recent years, it actually increases the 90/50 ratio. The top 5 percent's share of our expanded wealth measure rises 8 fewer percentage points compared with the top 5 percent's share of non-retirement wealth over the 1989–2019 period.

Saving for retirement years—in addition to saving for consumption smoothing, bequest, and precautionary purposes—is a prominent reason for holding wealth. While there are several mechanisms for saving, resources in retirement come primarily from (1) defined contribution accounts and liquid market wealth, (2) employer-provided DB pensions, and (3) Social Security benefits. Importantly, as described in Feldstein and Pellechio (1979) and Gustman and Steinmeier (1999), households do substitute over these different forms of retirement savings. Given this substitution, a more comprehensive measure of wealth that includes employer-provided DB pensions and Social Security benefits offers a useful perspective for any policy discussion related to financing retirement as well as wealth concentration. Another area where an expanded measure of wealth is appropriate is the study of trends in wealth concentration. The employment-based retirement system in the United States has evolved from one based primarily on DB pensions to one built around defined contribution (DC) plans. DC plans, unlike DB plans, are a form of market wealth and are included in the SCF and other household wealth surveys. The steady increase in the number of DC retirement accounts and account balances starting in the 1980s, therefore, represents in large part a transition between systems and not necessarily the accumulation of additional household wealth and increased wealth inequality. When both types of retirement accounts are captured, we find, the growth in wealth concentration over the past 30 years is moderated, but still present.

As documented in Poterba et al. (2011) and Gustman and Steinmeier (1999), these additional forms of wealth are empirically important resources to retirees in the United States—but they also impact decisions leading up to retirement. Social Security may crowd out private savings, but its near universally required participation is the primary mechanism for financing retirement in most lower income households, as these benefits alone represent the single-largest source of retirement income for more than 60 percent of retired households (Social Security Administration 2016). Similarly, employer-provided DB pensions also substitute for other private retirement savings. Both Social Security and DB pensions disproportionately benefit households below the top portion of the wealth distribution, and estimates of wealth concentration that do not include their value are potentially misleading, especially in the context of economic policy discussions. Nevertheless, nearly all research on wealth concentration relies on data that exclude the majority of assets linked to the most important income streams for retirees: Social Security and DB pensions.

However, in recent years there have been efforts to bring DB pension assets into the wealth concept for the purposes of studying wealth concentration. Saez and Zucman (2016) allocate the assets of DB pension plans from macrodata sources across households in the tax data, and Devlin-Foltz et al. (2016) augment SCF microdata by allocating DB plan assets across households based on their plan participation responses in the survey. Inclusion of improved measures of DB pension wealth results in somewhat lower

measures of wealth concentration in the SCF (Sabelhaus and Volz 2019). In more recent work, Sabelhaus and Volz (2020) estimate Social Security wealth (SSW) for all SCF respondents to study the accumulation of SSW over the life cycle. Their estimation approach for SSW and the wealth concept is slightly different from ours here, but they reach similar conclusions about the levels and trends of overall wealth inequality. Notably, outside of the United States, Kuhn (2020) and Bönke et al. (2019) examine augmented wealth measures that incorporate pension wealth in Switzerland and Germany, respectively. They find pensions have an equalizing effect on inequality, and to a degree very similar to what we find. In particular, Kuhn (2020) finds a decrease in the Gini coefficient from 0.75 for non-pension wealth to 0.55 when including pension wealth in Switzerland using data from 2015, while Bönke et al. (2019) find, in 2012 data, a decrease from 0.79 for non-pension wealth to 0.59 in their measure of augmented wealth in Germany. Although the countries, pension systems, and, to some extent, methodologies differ, we estimate a broadly similar decrease from 0.73 to 0.56 in 1992, and from 0.82 to 0.67 for 2019 data.

While including future DB and Social Security resources in an expanded wealth measure provides an additional and, we believe, very useful perspective on wealth or resource concentration, it is important to note how they are different from resources typically included in measures of net worth for studies of wealth concentration. Alvaredo et al. (2018) caution against strong interpretations when such illiquid resources are included to measure wealth inequality given that households do not have ownership over their Social Security wealth in the same way that they do over non-annuitized market wealth. Indeed, such resources cannot be used as collateral in part for these reasons, and their provision is subject to the fulfillment of future government obligations. If we were to measure the utility value of these resources, this inflexibility would likely mean that the utility of Social Security is less than that of other forms of wealth. However, because there remains a high degree of substitutability of DB pensions and Social Security with the other components of wealth, and accordingly much of the literature regarding wealth concentration is presented in levels, for comparability we do so as well. We discuss these aspects further below, and also include an exercise that highlights the impact of Social Security benefits on our measures of wealth concentration by showing the effects of a decrease in benefits that could arise from funding shortfalls.

Turning to the work that follows, in Section 2, we describe the SCF data we use in this analysis and detail the methods and additional data sources we use in estimating household-level earnings histories and expected Social Security benefits. We then describe the projection of SCF net worth components forward and augment these components with estimates of the present value of both future Social Security and DB benefits to form our expanded wealth measure. In Section 3.2, we present our results, which show that incorporating the asset value of expected retirement benefits, particularly Social Security, increases estimated wealth levels throughout the distribution and has a dramatic equalizing effect on the distribution of wealth. For example, among households with heads aged 40 to 49, the top 5 percent's share of wealth excluding retirement plans (DB and DC) and Social Security is 66 percent. Once these assets are included, the top 5 percent's wealth share falls to 41 percent. Examining trends over time in the distribution of wealth in our expanded wealth measure, we find that there is also a slight moderation of the trend toward greater inequality once we incorporate all forms of retirement wealth. Expanded wealth continues to become more concentrated over time, but at a somewhat slower rate than what is suggested by published SCF net worth statistics. In Section 4, we look at how several measures of wealth concentration would be affected if Social

Security benefits were reduced due to lack of program revenue, finding that wealth concentration would increase, especially for the younger cohorts. We conclude with a discussion in Section 5.

2. Data and Methods

To present an alternative and, we think, useful addition to the measurement of wealth concentration, we use the Survey of Consumer Finances (SCF) to develop an expanded measure of wealth that incorporates both estimates of defined benefit (DB) wealth and the expected present value of Social Security among the 40- to 59-year-old population. We directly incorporate the work of Sabelhaus and Volz (2019), who impute the value of DB wealth of 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. In this section, we discuss the SCF and our methods for (1) estimating earnings histories of survey respondents, (2) calculating future Social Security benefits, and (3) estimating age-forward SCF net worth, as well as DB pensions, to the point of retirement.

Our research adds to the literature that uses the SCF to develop broader wealth measures for assessing the distribution of wealth in the United States (Kennickell and Sundén 1997; Wolff 2007, 2014). These earlier studies rely solely on self-reported information on pensions in the SCF to estimate DB wealth for future retirees, which results in levels of predicted pension wealth that are inconsistent with economy-wide pension assets. Following Sabelhaus and Volz (2019), we combine aggregate data on plan assets from the Financial Accounts of the United States with the SCF survey data to estimate family-level DB wealth. (See Section 2.2 below and Jacobs et al. 2020 for additional details.) In calculating the Social Security wealth of current workers, Kennickell (2006) uses reported earnings history augmented with one year of Current Population Survey (CPS) data to estimate earnings profiles, and Wolff (2007) estimates in-sample human capital equations to predict future covered earnings. The static age-earnings profiles embodied in the Kennickell (2006) and Wolff (2007) approaches do not capture how earnings evolve over time for workers, an element we incorporate into our analysis by using cohort earnings trajectories.

2.1. SCF Data

Our primary data source is the 11 waves of the Federal Reserve Board's triennial Survey of Consumer Finances (SCF) conducted from 1989 through 2019. Several features of the SCF make it appropriate for exploring the distribution of wealth. The survey collects detailed information about households' financial assets and liabilities, and it 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 (for example, bank savings accounts) as well some that are held more narrowly and concentrated in the tails of the distribution (for example, direct ownership of bonds).

The primary purpose of the SCF is to collect information about household balance sheets. The SCF measures 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.[2] Questions on

[2] Assets do not include—and the SCF does not collect information on—the value of DB pensions or the implied annuity value behind future or current Social Security benefits of respondents.

household debt reflect all types of debt, including credit cards, mortgage debt, student loans, business debts, and other miscellaneous forms of debt.[3]

The study of wealth inequality depends crucially on data sources that successfully include the assets and debts of affluent households. The unique design of the SCF, which includes a large oversample of households with high predicted net worth, is motivated by the fact that business and financial wealth in particular are highly concentrated at the top of the distribution. Much of the research exploring wealth inequality in the United States uses the SCF, and suggests rising concentration at the top of the distribution (Bricker et al. 2016; Keister and Moller 2000; Wolff 1995; Kennickell 2006). The top 1 percent's share of wealth reported in the SCF rose from 30 percent in 1989 to 37 percent by 2019 (Bricker et al. 2020). A different approach to estimating wealth concentration is to use data estimated from the incomes of affluent households, as in Saez and Zucman (2020) and Smith et al. (2020). This approach uses a capitalization model predicting wealth based on flows of capital income reported on federal income tax forms and rates of return estimated from the Financial Accounts and other macrodata sources. Studies using this approach find increases in top wealth shares that are similar to those reported in the SCF (Bricker and Volz 2020).[4]

2.2. Defined Benefit Pensions and Social Security

Employer-sponsored retirement plans in the United States typically come in one of two forms: traditional DB plans or the now more common DC plan. DB plans provide a beneficiary with a promised income stream from the beginning of retirement until death, and adequately funding those promised benefits is the responsibility of the employer. These plans are often a function of a worker's highest wage, the number of years a worker participated in a plan, and a plan-specific generosity factor. Although the SCF includes carefully crafted and detailed questions about DB pension plans, measuring the expected present asset values of future DB pension payments is not well suited to a survey. Respondents enrolled in DB pension plans are asked questions about expected future benefits. However, many workers, particularly those further from retirement age, know less about their plans or future benefits, and the information collected from these questions is not necessarily a good reflection of what they will actually receive (Starr-McCluer and Sunden 1999).

Instead of using the expected future benefit responses provided by DB plan participants, we rely on the estimated DB pension wealth for SCF households developed by Devlin-Foltz et al. (2016) and

[3] 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 the household and family units employed by the Census Bureau, but it 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. More details about the survey sample design are in Appendix A.1.

[4] Research using wealth data not based on special efforts to sample high-wealth households, the Panel Study of Income Dynamics (PSID), for example, reports substantially lower levels of wealth concentration (Fisher et al. 2016; Pfeffer et al. 2016). Because—by all accounts—a high share of wealth is concentrated at the top, surveys not aimed specifically at studying this are likely to be inaccurate in measuring wealth inequality. The top 5 percent's wealth share for 1989, for example, was 47 percent in the PSID, but 57 percent in the SCF (Wolff 2006). Studies in the United States that do incorporate Social Security and DB pension benefits in household wealth, chiefly using the Health and Retirement Study (HRS), do so only for the older, primarily retired population and likewise do not have a sample design intended to incorporate particularly wealthy households, as the SCF does, thus they are less informative about wealth concentration across the population.

Sabelhaus and Volz (2019). Their approach distributes aggregate household sector DB assets from the Financial Accounts of the United States (FA) to both current and future beneficiaries using survey information on benefits currently received for those receiving payments, reported future payments for those with coverage from a past job, and age, wages and years in a DB plan for those not yet receiving benefits. They combine the survey information with real discount rates that fluctuate over time, cohort life tables and differential mortality, and the assumption that current beneficiaries have first claim to DB plan assets. Devlin-Foltz et al. (2016) and Sabelhaus and Volz (2019) find that including 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 in their discussion of wealth distribution.

To measure the DB wealth of SCF respondents, we first calculate a present discounted value (PDV) of benefits being paid to current beneficiaries and individuals who have entitlements based on a previous job, using their reported current or expected future benefit, respectively. The sum of the PDV is subtracted from the aggregate accrued pension obligation reported in the FA. We allocate this residual—the aggregate minus sum of PDV above—to workers with DB entitlement from their current job using their age, current wage, and years in the plan.[5]

Social Security is a federal entitlement program in the United States.[6] What is colloquially referred to as "Social Security" is, specifically, retirement or old-age benefits that are part of the Old-Age, Survivor, and Disability Income (OASDI) program under the Social Security Administration and covers nearly all workers. It is a "pay-as-you-go" system financed by a 12.4 percent tax on earnings that is split equally between employees and employers up to a wage cap, which was $137,700 in 2020. An individual's benefit is a function of their highest 35 years of wages. The Normal Retirement Age (NRA) has risen from 65 to 67, with the latter applying to all cohorts born after 1959. One's benefit is reduced if it is claimed earlier than the NRA (retirement can begin at age 62) and increased for delayed claiming up to age 70. To develop estimates of future Social Security benefits, and their implied asset value, we first must estimate earnings histories of and projections for respondents and their spouses for the SCF.

2.3. Estimating Earnings Profiles in the SCF using Current Population Survey Cohorts

In order to estimate future Social Security Old-Age benefits, we need to know a person's full earnings path up to the time of retirement. We estimate an individual's earnings history and also project earnings up to the time they will claim Social Security. To construct a full earnings history and projections for SCF respondents, we apply the growth in earnings over one's working life implied by the shape of Current Population Survey (CPS) earnings estimates for individuals most similar to the SCF respondent based on

[5] See Jacobs et al. (2020) and Sabelhaus and Volz (2019) for more details on DB wealth estimation.

[6] in the United States, an entitlement refers to a "[f]ederal program or provision of law that requires payments to any person or unit of government that meets the eligibility criteria established by law. Entitlements constitute a binding obligation on the part of the Federal Government, and eligible recipients have legal recourse if the obligation is not fulfilled." Source: https://www.senate.gov/reference/glossary term/entitlement.htm.

birth year, occupation, education level, and sex. While the SCF is not a panel, retrospective questions allow construction of a broad work and earnings history.[7]

From the 1989–2019 SCF data, we take respondents aged 40 to 59 at the time of the interview (and including spouses aged 30 to 65) and use the information reported in the SCF on (1) current occupation, earnings, and tenure; (2) retrospective occupation, earnings, tenure information; and (3) future work expectations. For each respondent and spouse, we estimate a full history of past and future earnings using regression estimates described below, relying on CPS data from 1964 through 2019. Individuals are categorized into earnings-trajectory types by twenty-two possible birth-year cohorts (three-year cohorts beginning with 1924 through 1926 and ending with 1987 through 1989), three education levels (less than high school, high school or equivalent, some college/degree), and five broad occupation categories ([1] management, professional, and related; [2] service; [3] sales and office; [4] construction, maintenance, production, transportation; and [5] the self-employed from all occupations).[8] When an individual's birth-year cohort is not observed in the CPS at a given age, we broaden the categories, defining by education-occupation types instead (for men and women separately). For instance, the youngest person whose earnings profile we want to estimate was born in 1989 and was 30 years old at the time of the 2019 SCF interview. The estimates are based on earnings for those born in the 1987–89 period who were as old as 32 in the 2019 CPS. To forecast earnings growth after age 32, we use coefficient estimates from the education-occupation model. Similarly, for the oldest birth year in the earliest SCF (1989), 1924, we use the education-occupation model coefficients to fill in earnings at ages that are prior to 1964. Those born between 1942 and 1954 are fully covered by the CPS.

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

$$\ln y^g = \beta_0^g + \boldsymbol{\beta}_{\text{age}}^g \mathbf{age} + \beta_{PT}^g \text{PT} \tag{1}$$

where $\boldsymbol{\beta}_{\text{age}}^g \mathbf{age} = \sum_{j=1}^{4} \beta_j^g \text{age}^j$ and PT is an indicator for part-time work. We then back out an individual's individual effect, β_{0i} , at the time of the SCF survey, so that

$$\beta_{0i}^g = \ln y_i - \left(\boldsymbol{\beta}_{\text{age}}^g \mathbf{age}_i + \beta_{PT}^g \text{PT}_i\right) . \tag{2}$$

The individual effect in any year is a weighted average of the individual and group constants, and, respectively, where we place more weight on the group average constant as we estimate periods further out from the reported income in the SCF. Specifically, the constant at time t is $\beta_i^{W,t} = \rho^t \beta_{0i} + (1-\rho^t)\beta_0^g$, where we set $\rho = .85$ to capture persistence in earnings. To predict income, we then apply $\beta_i^{W,t}, \boldsymbol{\beta}_{\text{age}}^g$, and β_{PT}^g for all ages for each individual. Anyone who reports a longest prior occupation type

[7] For additional details on the technical elements of the development of the earnings profiles, calculation of Social Security benefits, or the "aging-forward" of the elements of market wealth, see Jacobs et al. (2020).

[8] There are 822 possible types: 660 of the more specific cohort-occupation-education-sex combinations, 132 cohort-education-sex combinations (applied when occupation is unclear), and 30 occupation-education-sex combinations (applied when estimating earnings that are outside the ages that the birth-year cohort is observed in the CPS or when some information is missing).

that is different from their current occupation will have different coefficients applied to the relevant years.[9]

We assume when estimating an individual's future earnings that they will work until their expected retirement age, as reported in the SCF. The estimated earnings for a person's type will account for relatively short periods of unemployment, as they include total earnings for those who were not employed for the entire year prior. However, with these measures, we are not able to capture losses due to long-term unemployment, unanticipated early or partial retirement, or permanent labor force exit through disability. Nonetheless, our estimated earnings profiles of these SCF respondents match the CPS profiles quite well.

2.4. Social Security Benefits Calculations

Having the earnings profile for each individual aged 20 through 61, one can apply Social Security benefit calculations for each household. First, nominal earnings are indexed to age 60, and the highest 35 earnings 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 cohort-specific actuarial adjustment. We assume all individuals begin benefit receipt at age 62, which provides a lower bound for total household Social Security wealth (SSW). Future benefits are discounted to the survey year using a 3 percent real discount factor and survival rates that vary by cohort, marital status, race, and education (based on cohort life tables from the Social Security Administration and differential mortality estimates from Chetty et al. 2016). Secondary earners, typically wives, are entitled to their own benefits, calculated from past earnings, and also spousal and survivor benefits. We assign spousal benefits to the household if the expected spousal benefits are larger than the wife's worker benefits at age 62. If the duration of a current marriage is less than 10 years when the wife is age 62, the wife does not receive spousal or survivor benefits.[10]

The measure of SSW used is net of expected future employee contributions. Thus, for every year following the survey, we calculate expected tax payments of 6.2 percent, the employee portion of the payroll tax, and subtract the present value of all future contributions from the calculated gross SSW measure, as detailed above.

2.5. Creating the Expanded Wealth Measure

The expanded wealth measure that we analyze below is created by bringing together (1) the implied wealth of Social Security benefits net of contributions and including future projected work up until the time of retirement, (2) wealth from DB pensions projected to the expected job end date, and (3) projected future wealth from all assets and debt measured directly in the SCF data.

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[9] As an example, suppose 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 eight years. The longest prior job he reports lasted 12 years, was in a different occupation, and ended 14 years ago with his earning at $35,000. 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 what is shown in Figure A.1 of Appendix A.2.

[10] The SCF does not collect information about the length of previous marriages, thus, some individuals with more than one marriage may not be accurately assigned dependent benefits from a former spouse.

To be consistent with the estimates of future Social Security wealth (which reflect expected benefits at age 62, not only those accrued at the interview date), we project the value of SCF net worth, not including DB wealth, to age 62 (part [3] above). These projections are based on in-sample estimates of the growth paths of wealth for individuals who are older than 30 using all 11 SCF cross sections (1989 through 2019). We categorize each household into one of three groups based on their age-specific location in the current wealth distribution among households in each survey.[11] We then estimate age-wealth profiles separately for each group, pooling all surveys, and apply the growth rates from these profiles to project households' survey wealth forward to age 62. Separate profiles are estimated for (a) DC pension wealth and (b) all other forms of wealth measured in the SCF. The projected wealth values at age 62 are then discounted back to the household head's age at the time of the survey.

We also project forward DB wealth to an individual's expected job ending date or age 62, whichever comes first. This also brings DB wealth conceptually in line with both Social Security wealth and projected DC wealth to acknowledge that households may have many more years of accumulating benefits, and it allows us to better compare age groups over time. To project DB benefits, we estimate the implied "generosity factor" from the Sabelhaus and Volz (2019) accrued DB wealth estimate. The generosity factor reflects a percentage of final wages given as a DB benefit for each year of service one accumulates. For example, in a plan with a 1 percent generosity factor, an individual with 30 years of service would receive 30 percent of their final wages as a DB benefit. For a given generosity factor, one can project a final DB payment for each individual, given their projected wages and expected years remaining at their current job. Expected DB payments then are transformed into present discounted value as of the survey date. The "expanded wealth" measure we analyze below combines the net present value of projected SCF net worth with projected DB wealth and expected net future Social Security wealth.

3. Expanded Wealth and Measures of Wealth Concentration

In this section, we describe the results for wealth concentration using our expanded wealth measure. We show results for both the 40–49 and 50–59 age groups over time for each SCF cross section from 1989 through 2019. We first show summary statistics on non-retirement wealth, the components of retirement wealth, and the combined wealth measure. Then we calculate wealth percentile ratios and concentration measures. Overall, we find that there is substantial variation in asset-type holding across the distribution of expanded wealth. Additionally, by incorporating defined benefit wealth and Social Security wealth, we find lower measures of wealth concentration and moderated, but still present, increases in wealth inequality over time.

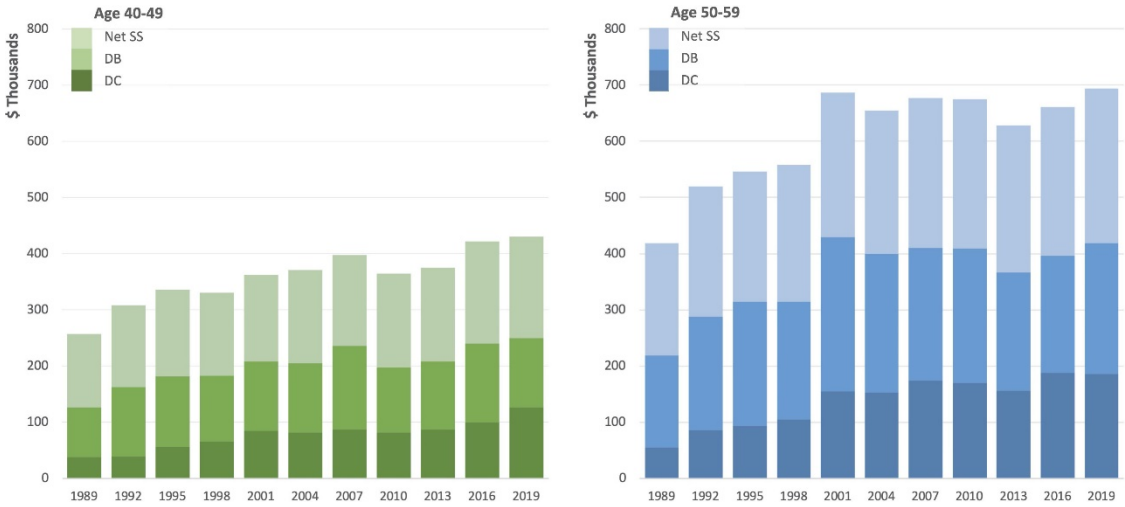
3.1 Components of Retirement Wealth

We first describe the major components of retirement wealth: defined contribution (DC) plans, defined benefit (DB) pensions, and Social Security wealth. We initially summarize the non-projected survey estimates of DC and DB wealth and the net present value of Social Security benefits. Broadly speaking,

[11] The categories are defined as the bottom 40 percent, next 40 percent, and top 20 percent by wealth for 10-year age groups. Households are divided into these categories to estimate the growth in wealth for households showing the most similar wealth-accumulating behavior. The categories are kept relatively broad, however, to capture the group in which a household would likely remain over the ages of 40 to 62.

DC and Social Security wealth have grown over time. DB wealth reached a peak in the 2000s but remains a significant component of wealth.

Figure 1: *Mean Retirement Wealth by Type, Age Group and Year (Real 2019$, thousands)*



Note: DC and DB wealth are values as of the survey date. Net Social Security wealth is the future stream of projected benefits at age 62, discounted back to the household head's age at the time of the survey.

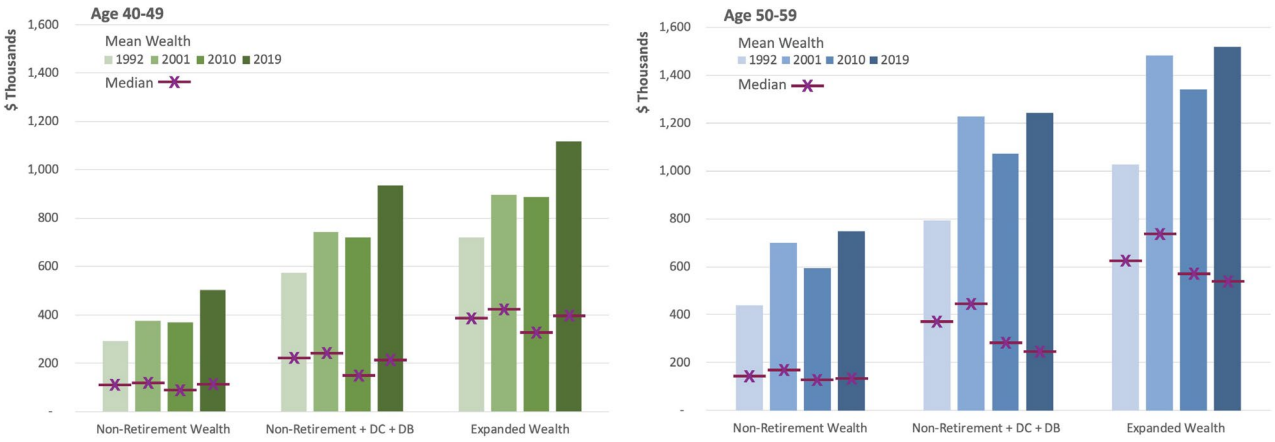
The average wealth in DC plans held by both age groups has followed a well-documented path, rising substantially in the years before the financial crisis, experiencing a period of stagnation, and then reaching a new peak about the time of the 2016 and 2019 SCF surveys. Among those aged 40 to 49, the mean DC balance started at $38,000 in 1989 and reached $126,000 in 2019 after plateauing at about $85,000 from 2001 through 2013 (Figure 1, left panel). As individuals get closer to retirement age, the average DC balance increases. Among the 50–59 age group, the mean DC balance was $55,000 in 1989, rose to $174,000 in 2007, fell back to $156,000 in 2013, and then rose to a new high of $188,000 by 2016 (Figure 1, right panel). Because DC accounts were not introduced until the late 1970s, it is not surprising that the average balances were low in 1989. The data indicate substantial retirement preparation prior to age 40 by both age groups, but a considerable amount of retirement wealth accumulation is also taking place as households move closer to retirement.

For the 40–49 age group, the mean DB wealth started at $88,000 in 1989, peaked in 2007 at $148,000, and was $123,000 in 2019 (Figure 1). Mean DB wealth for 50- to 59-year-olds was $274,000 in 2001, fell across the remaining waves to a low of $208,000 in 2016, but had increased somewhat by 2019. Some of the difference in DB wealth between the two age groups that we observe is mechanical, as the same future benefit has to be discounted further back in time for younger ages. In addition, DB coverage is lower for younger workers, particularly in later years.

Predicted Social Security wealth (SSW) accounts for the largest portion of retirement wealth for both age groups in almost all years. The mean SSW rose from $130,000 in 1989 to $181,000 in 2019 among 40- to 49-year-olds, and it rose from $199,000 to $275,000 over the same period for 50- to 59-year-olds. SSW

has risen along with earnings growth in the working population, but it has been generally flat for the older age group since the Great Recession. The broad growth in SSW, particularly in the 1990s, has come generally from two sources: higher real wages and the increased labor force participation of women.

Figure 2*: Retirement Wealth by Concept, Mean and Median for Age Group and Year (Real 2019$, thousands)*



Note: Non-retirement wealth, DC wealth, and DB wealth are projected values, as described in the text, discounted back to the time of the survey. Net Social Security wealth is the future stream of projected benefits at age 62, also discounted back to the household head's age at the time of the survey.

3.2 Expanded Wealth Measures

To form our expanded wealth measure, we add the retirement wealth comprising DC plan wealth, DB pensions, and estimated Social Security wealth to non-retirement wealth, which includes housing and other forms of financial and non-financial wealth. In these expanded wealth measures, all wealth is projected forward to age 62 for non-retirement wealth and DC wealth, and to the age that a current worker with a DB plan expects to separate from their firm. These components are then discounted back to one's age at the time of their SCF response, allowing for comparable wealth components and better comparisons across age groups and over time. Due to life-cycle patterns, those in their 40s are expected (and shown, in Figure 1) to have less wealth accumulated for retirement. In these measures, we can see that the effects of the 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 (Bricker et al. 2019).

The first set of bars in the left and right panels of Figure 2 depicts trends in non-retirement wealth and show that both age groups saw their highest mean in 2019 and that there has been little change in the median over time. The middle set of bars, which combine non-retirement wealth with private retirement wealth, indicate that when DC and DB pensions are included in the analysis, mean wealth has increased over time for both age groups, but median wealth has not increased. In fact, median wealth was lower for both age groups in 2019 than it was in 1992, substantially so for the 50–59 age group.

The third set of bars in the left and right panels of Figure 2 incorporate projected net Social Security wealth, and we again see the highest mean wealth in 2019 and stable or declining median wealth. Mean expanded wealth, including non-retirement wealth, DC and DB pension wealth, and net Social Security wealth, rose from $720,000 in 1992 to about $1.1 million by 2019 for 40- to 49-year-olds. Among 50- to 59-year-olds, mean expanded wealth rose from just over $1 million in 1992 to $1.5 million in 2019. Over the same time period, median expanded wealth rose slightly for 40- to 49-year-olds, from $392,000 to $403,000, and declined from $623,000 to $539,000 for the older age group.

3.3 Components of Combined Wealth across the Distribution

The individual components of the combined wealth measure have very different distributions across the population. Some components are widely held across all or much of the distribution, while others are held only by households at the very top.

We illustrate the wide variation of asset composition across households by showing the values of wealth components at different points of the combined wealth distribution in Table 1. These results make it very clear that households at the bottom of the combined wealth distribution rely heavily on Social Security, which accounts for more than two-thirds of all wealth at the 10th and 25th percentiles of the wealth distribution for both age groups and for about half of combined wealth even for households at the 50th percentile. The role of non-retirement wealth has diminished dramatically for households in the bottom quarter of the combined wealth distribution.

To be sure, Social Security continues to account for a considerable portion of combined wealth even for households higher up the wealth distribution. Among 50- to 59-year-olds, Social Security wealth (SSW) still accounted for one-quarter of expanded wealth at the 75th percentile in 2019. It is only at the top of the distribution (the 90th percentile here) that SSW was surpassed by both DB and DC wealth as a share of expanded wealth. For both age groups in 2019, Social Security accounted for only 10 to 11 percent of the expanded wealth of households at the 90th percentile of the distribution.

3.4 Wealth Inequality

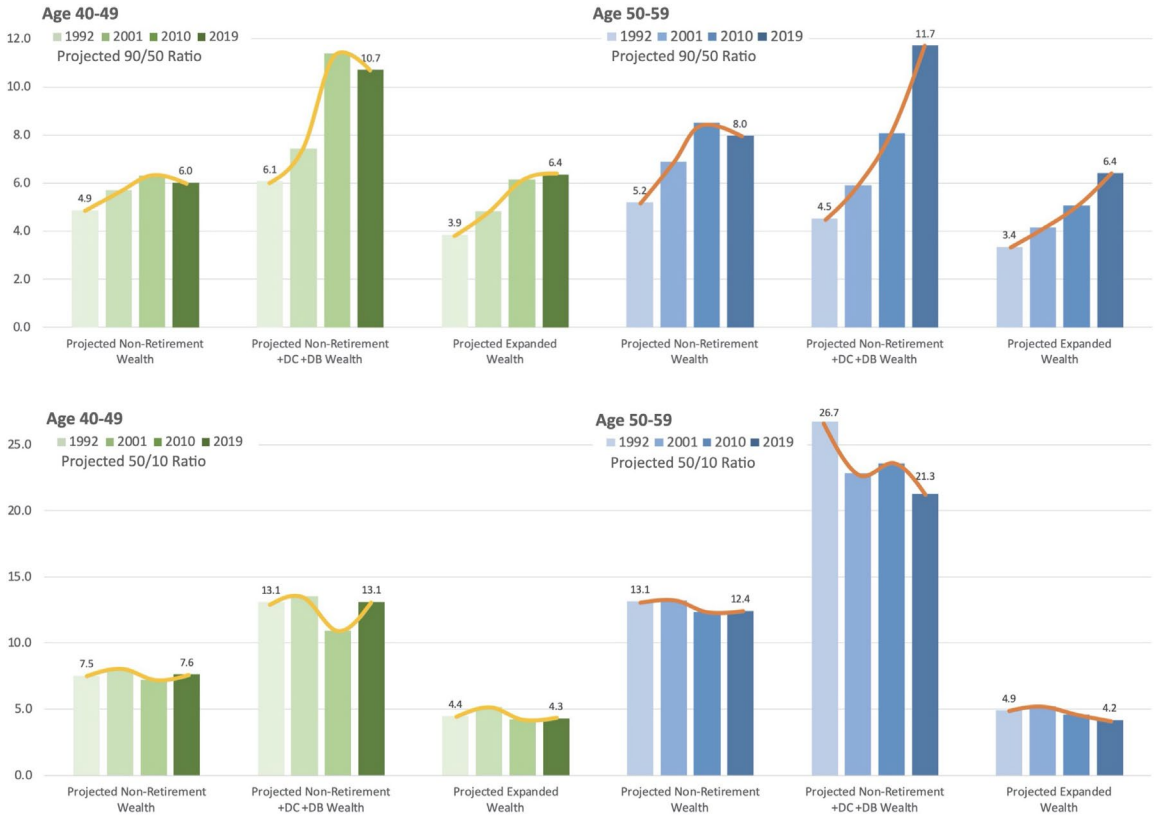
We find that wealth inequality rose over the 1989–2019 period and that the inclusion of Social Security and retirement plan wealth has an impact on both the level of inequality and its trend. In this section, we focus on ratios of wealth held at the 90th percentile of the wealth distribution to wealth held at the 50th percentile (P90/P50), as well as ratios of wealth held at the 50th percentile to wealth held at the 10th percentile (P50/P10), as measures of the skewness of the wealth distribution. In Figure 3, we see that among the 40–49 age group, the P90/P50 of non-retirement wealth rose from 4.9 in 1992 to 6.0 in 2019; among 50- to 59-year-olds, it climbed from 5.2 to 8.0. The P90/P50 of expanded wealth for the younger age group rose from 3.9 in 1992 to 6.4 in 2019. For 50- to 59-year-olds, the combined wealth P90/P50 rose from 3.4 in 1989 to 6.4 in 2019. In contrast, the P50/P10 ratio of expanded wealth declined slightly for 40- to 49-year-olds, from 4.4 to 4.3 from 1992 to 2019. It also decreased for 50- to 59-year-olds, falling from 4.9 to 4.2 over the same time period.

Table 1: *Mean Wealth Levels at Points of the Expanded Wealth Distribution, by Age group and Wealth Component, 1992, 2001, 2010, and 2019 (real 2019$, in thousands)*

Wealth Percentile		Ages 40–49					Ages 50–59				
		Non-ret.	DC	DB	Soc. Sec.	Expanded	Non-ret.	DC	DB	Soc. Sec.	Expanded
p10											
	1992	$23	0.5	1.2	57	81	$20	0.8	1.6	91	113
	2001	21	1.2	0.7	55	77	31	1.3	2.0	99	132
	2010	11	0.6	-	57	69	12	1.8	0.9	101	116
	2019	20	0.7	0.1	65	86	12	2.7	2.1	105	122
p25											
	1992	$49	1.3	13	98	161	$86	4.1	13	174	276
	2001	41	2.4	8.8	107	159	64	9.7	17	193	284
	2010	36	3.8	1.4	105	146	58	5.8	13	175	251
	2019	40	3.5	4.6	131	179	49	10	2.5	178	240
p50											
	1992	$121	30	66	177	394	$177	27	152	270	627
	2001	156	48	38	182	424	230	58	137	301	725
	2010	120	29	4.4	180	334	170	39	77	293	579
	2019	136	47	8.8	210	402	147	53	44	295	540
p75											
	1992	$310	68	346	211	935	$389	100	387	304	1,180
	2001	399	121	367	196	1,082	509	192	584	328	1,613
	2010	340	115	283	226	963	431	140	585	333	1,488
	2019	372	193	364	218	1,147	434	229	458	362	1,483
p90											
	1992	$526	127	714	222	1,588	$898	206	751	350	2,205
	2001	664	388	899	238	2,189	1,120	345	1,381	401	3,247
	2010	570	395	952	253	2,170	1,261	467	1,059	419	3,206
	2019	712	642	1,022	271	2,647	1,248	492	1,529	412	3,680

Note: Each statistic is actually calculated as the mean of the wealth concept for households (by age group and year) within +/- 5 percentage points of the cut point of the expanded wealth distribution. So, for example, the values for P10 of the combined wealth distribution is the mean for each wealth component for households between the 5th and 15th percentiles of the combined wealth distribution

Figure 3: *Distribution of Wealth by Concept, Year, and Age Group: Ratio of 90th percentile to Median (upper) and Median to 10th percentile (lower)*



In Table 2, we show the top 5 percent's and top 10 percent's shares of different wealth concepts for another perspective on wealth concentration. Here, we see that a large share of all types of wealth are held at the top of the distribution, but especially so for non-retirement wealth. For instance, those in the top 10 percent of the non-retirement wealth distribution among 40- to 49-year-olds held 60 percent of non-retirement wealth in 1989 and 75 percent in 2019. Including Social Security and retirement wealth in the wealth concept results in significantly lower top shares and less growth in the concentration of wealth. For all households in our sample, we estimate that in 2019 the top 5 percent of the distribution held 72 percent of non-retirement wealth but 51 percent of wealth including DB and DC pensions and only 45 percent of expanded wealth, which includes net Social Security wealth.[12] Social Security is very broadly held and has an equalizing effect; the top 5 percent held only 8 percent of this component in 2019.

[12] Households are re-ranked in each iteration of expanding the wealth concept.

Table 2: *Wealth Shares of the Top 5 Percent and Top 10 Percent*

	Ages 40–49			Ages 50–59			Ages 40–59		
	Non-Ret. Wealth	**Non-Ret. + DB + DC**	**Exp. Wealth (Incl. SS)**	**Non-Ret. Wealth**	**Non-Ret. + DB + DC**	**Exp. Wealth (Incl. SS)**	**Non-Ret. Wealth**	**Non-Ret. + DB + DC**	**Exp. Wealth (Incl. SS)**
Top 10%									
1989	60.1	50.3	43.8	63.3	50.6	42.6	63.3	52.8	47.8
1992	61.2	48.4	41.6	63.2	50.2	42.2	66.7	54.2	47.5
1995	61.4	50.4	43.1	68.2	52.6	44.7	68.4	55.9	49.2
1998	62.8	52.2	45.1	70.3	56.6	48.1	68.9	56.2	50.3
2001	62.5	52.6	46.3	71.7	56.0	49.1	70.5	58.5	53.2
2004	66.3	54.7	47.6	70.2	55.8	48.6	71.4	58.8	53.0
2007	67.6	56.3	49.3	72.5	59.1	51.3	72.7	61.1	54.3
2010	72.5	60.4	52.0	72.4	58.1	50.0	77.0	62.9	56.0
2013	72.9	60.4	51.9	75.5	58.9	49.9	76.4	60.9	53.5
2016	69.7	58.5	50.3	81.6	67.3	58.4	80.5	66.7	59.5
2019	75.3	62.0	54.3	79.0	62.9	54.3	80.3	65.7	58.8
Top 5%									
1989	48.3	37.2	31.6	49.8	35.9	29.2	53.3	40.6	35.2
1992	49.3	34.5	29.1	51.7	36.5	29.9	55.4	40.6	35.0
1995	49.0	35.8	30.3	58.0	40.2	33.1	58.4	42.8	36.3
1998	51.1	38.2	32.9	59.6	43.4	36.0	59.1	42.0	37.9
2001	49.9	37.3	32.1	60.3	42.1	36.3	59.7	43.9	40.4
2004	54.8	39.5	33.7	59.7	41.6	35.8	60.5	44.4	39.8
2007	55.5	39.9	34.7	61.3	45.1	38.5	62.7	46.3	40.6
2010	61.5	44.6	37.8	58.9	42.3	35.2	65.2	48.4	42.8
2013	61.9	44.2	37.3	64.2	44.6	36.9	66.5	44.1	38.6
2016	57.6	42.7	35.9	70.9	52.7	44.7	71.5	51.8	46.8
2019	65.9	46.7	40.5	67.0	47.1	39.9	71.5	51.2	45.4

From 1989 to 2019, the top 5 percent's share of non-retirement wealth rose 18 percentage points, while its share of expanded wealth rose only 10 percentage points. Similar trends are seen when comparing the share of wealth held at the top 5 percent and top 10 percent of the distribution for both age groups over time: Concentration decreases substantially when DB and Social Security wealth are considered, with increases in wealth concentration remaining over time for all wealth concepts.

4. Effects of Potential Social Security Shortfalls on the Wealth Distribution

So far, we have shown that wealth distribution and trends over time differ substantially depending on whether one considers a narrower definition of wealth versus a projected, expanded wealth concept. Our definition of expanded wealth includes both projected DB and DC private pension wealth and expected

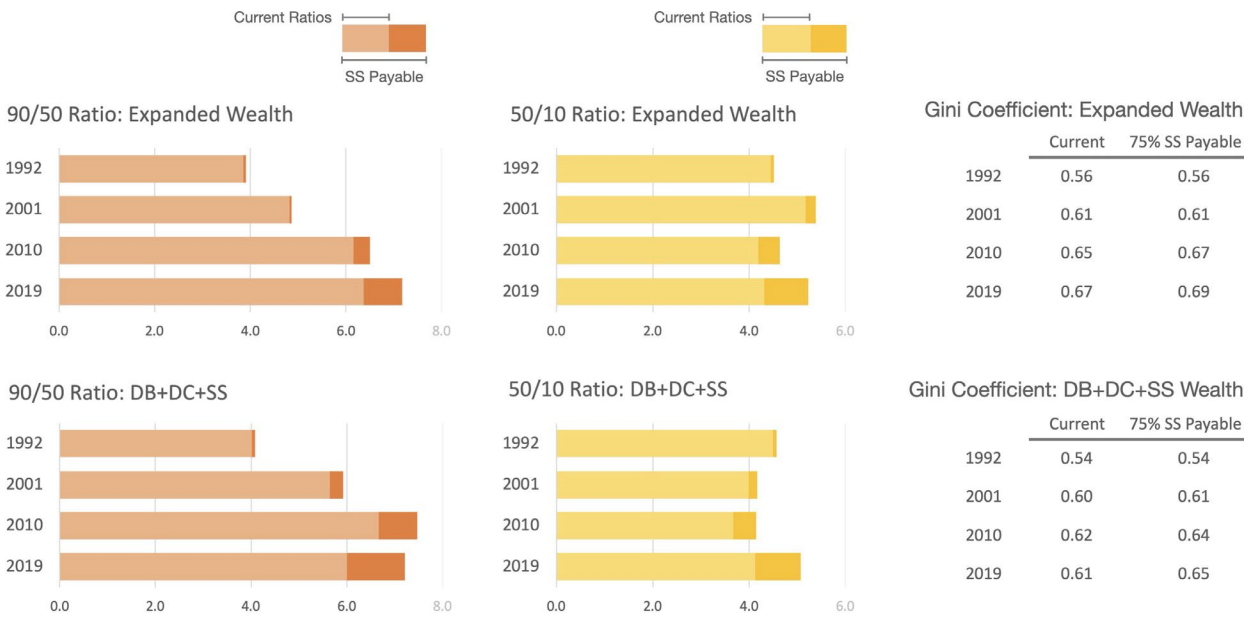
future Social Security resources. While we find that conceptualizing Social Security as wealth reduces wealth concentration, the extent of the reduction depends on the level of Social Security benefits that are realized in the future. We estimate the Social Security retirement benefits one would receive based on their projected earnings histories and associated contributions to the program. However, while Social Security is classified as an entitlement program, current actuarial projections show future payout obligations exceeding the "pay-as-you-go" tax revenue that funds Social Security. To meet program obligations, several policy changes could be implemented. These include any one or some combination of the following: (1) further increases to the normal retirement claiming age, which has already occurred; (2) changing the cost of living adjustment formulas; (3) raising the income cap on Social Security taxation. However, if the funding shortfall is not addressed through any of these remedies or others that have been proposed, the benefits paid out would be reduced legally to the level of concurrent program revenue.

While benefit obligations exceeding revenue currently are paid through the Social Security Trust Fund, the fund is expected to be depleted after the year 2034. At that time, program revenues are expected to be about 75 percent of obligations, according to the 2020 Old-Age, Survivors and Disability Insurance (OASDI) Trustees Report, and as noted above, under current law, payouts would be reduced to the level of program revenue. In this section, we consider the implications of this "worst-case scenario" for future beneficiaries—in the sense of bringing about the largest reduction (25 percent) in benefits received—for our estimates of wealth trends, distributions, and the Gini coefficient.

In Figure 4, we show the P90/P50 and P50/P10 ratios and Gini coefficients for the 40–49 age group for expanded wealth as well as DB, DC, and Social Security wealth only. We find that for recent years, reducing Social Security benefits to 75 percent of the current benefit levels has an effect on all measures of wealth concentration for both wealth concepts. In the upper panel, we see that for expanded wealth, the P90/P50 ratio for 2019 would increase from 6.4 to 7.2, and the P50/P10 ratio would rise from 4.3 to 5.2, while the Gini coefficient would increase from 0.67 to 0.69. The effects are even greater when we look at DB, DC, and Social Security wealth only (lower panel): The P90/P50 ratio for 2019 increases from 6.0 to 7.2, the P50/P10 ratio from 4.1 to 5.1, and the Gini coefficient from 0.61 to 0.65.

One factor that matters in practice is that Social Security retirement benefits in the United States may be accompanied by Supplemental Security Income (SSI), which increases the total of Social Security and SSI monthly benefits to a minimum level. For this exercise, a reduction in benefits of 25 percent would increase the share of households receiving SSI due to their Social Security benefits falling below the threshold from 4.2 to 14.1 percent. While SSI is not incorporated into the calculations for Figure 4, it would reduce the impact of decreasing Social Security benefits on the P50/P10 figures, as many in the bottom 10 percent would see their benefits supplemented by SSI, while those at the 50th percentile would not.

Figure 4: *Measures of Wealth Concentration among Ages 40 to 49, under Current and 75 Percent Payable Social Security Benefits*



5. Conclusion

Focusing on two pre-retirement age groups from 1989 to 2019, we find that using an expanded measure of wealth that includes DB pension and Social Security resources to estimate wealth concentration in the United States results in a level that is lower than estimates based on more commonly used measures of market net worth. We present this finding through several wealth concentration measures, including shares of wealth held by the top of the distribution, ratios of wealth held at different points in the distribution, and the Gini coefficient. We also find that while wealth concentration has risen over the past three decades, it has done so more slowly for this expanded wealth measure.

We believe that this expanded wealth measure offers a valuable perspective on wealth concentration and its evolution for two broad reasons. The first concerns the substitutability across different forms of wealth from the perspective of a household. Retirement is a major reason for saving among many households, and DB pensions and Social Security are significant resources for most households. Because they are to some degree a substitute for (that is, they "crowd out") other forms of savings, their inclusion is appropriate for a more complete understanding of wealth and resources at older ages. Because Social Security especially is broadly held across the wealth distribution, its exclusion leads to measures of wealth concentration that are higher than what we find through our expanded wealth concept. This expanded wealth measure also helps us to better understand the implications of policy for wealth distribution and economic well-being, as seen through our exercise on the effects of a hypothetical reduction in Social Security benefits.

The second benefit of this expanded wealth measure is that by including DC plans and DB pensions, we improve our understanding of trends in wealth concentration over time. The transition away from private DB pensions—which are not included in surveys or typical measures of net worth—to DC plans—which are included—presents a measurement issue where growth in net worth that includes only DC plans is mechanically overstated. Estimating DB pension wealth helps to correct this issue, and its inclusion is one contributor to the lower rate of growth in wealth concentration over time that we find with the expanded wealth measure.

Although an expanded measure of wealth offers additional context for studying wealth inequality, it also has some drawbacks relative to measures that include only standard market wealth as household net worth. One clear advantage of measures that include only market wealth is that the value of market assets is readily measured, subject to standard treatment for taxation, accounting, and transaction purposes, and widely available in data sets for comparison; very few assumptions are necessary (for example, no assumptions about the timing of Social Security claiming are needed). An additional drawback to the expanded measure of wealth lies in the challenge of merging resources that are not pure substitutes. While the resources we combine are to some extent treated as alternatives by households, they do not have the same degree of liquidity, allow for the same level of control, or even offer the same level of "prestige"—that is, these resources yield different levels of utility. To address this issue, one could estimate a life-cycle model in which utility is separable over all forms of resources and wealth, measure substitutability, and use parameter estimates to make approximate representative utility comparisons.

While there are both merits and disadvantages to consider when looking at either narrow or expanded definitions of wealth, we see these multiple perspectives as complementary and, taken together, suitable and highly useful for the study of household resources and wealth concentration.

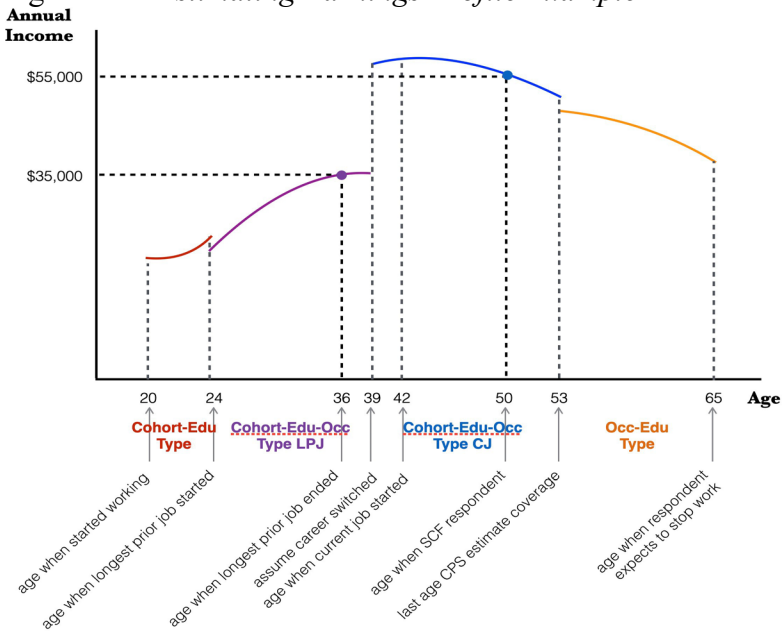
A. Appendix

A1. The SCF Sample

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 developed from statistical records derived from tax returns under an agreement with the IRS's Statistics of Income (SOI).[13] 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. This list sample primarily consists of households with a high probability of having high net worth. 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. The SCF combines the observations from the AP and list sample through weighting, and 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. 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. These weights are used in all calculations.

A2. Earnings Estimate Example

Figure A.1: *Estimating Earnings Profile Example*



[13] See Bricker and Engelhardt (2014) and Bricker et al. (2017b) for recent discussions of the sampling strategy, the list sample, and the weights used in the SCF. See Wilson et al. (1983) and Internal Revenue Service (1992) for a description of the SOI file.

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