Abstract

In simple lifecycle models with endogenous retirement the level of total household wealth should be what matters for the decision to retire, and the composition of that wealth should be unimportant. That simple proposition is rejected here using Survey of Consumer Finances (SCF) micro data for the period 1995 through 2016. The extensive SCF labor force modules, which include both employment histories and future work expectations, are the starting point for studying the correlation between expected retirement and household portfolios. Respondent expectations about future work for near-retirees are shown to be consistent with retirement patterns observed in panel data sets as well as the actual (recall-based) retirement patterns of older SCF respondents. The retrospective employment and earnings histories are used to estimate defined benefit (DB) pension and Social Security wealth for the same group of near retirees. The DB and Social Security present value wealth estimates are combined with detailed SCF household balance sheets that cover all other wealth components, making it possible to study the correlation between retirement expectations using comprehensive and disaggregated portfolios.

Keywords: retirement, household wealth, household portfolios

JEL Codes: D15, G11, J26

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1. Introduction

Typical career retirement ages and labor force participation rates for males at older ages have been rising steadily in the U.S. for more than twenty years (Coile, 2015; Coile and Stewart, 2019). Despite the trend towards working longer, the expected funding shortfalls in programs such as Social Security, Medicare, and Medicaid are still daunting (SSA, 2019; CMS, 2019). One view to resolving the looming fiscal imbalances is that more people should work even longer than is expected under the current baselines, which would increase revenues and/or decrease costs in the relevant programs. The key question then becomes what circumstances or policy changes will lead more people to work longer, and that requires a better understanding of individuals’ actual retirement decisions. The focus of this paper is on a potentially crucial but understudied determinant of the retirement decision, the structure of household portfolios.

In a simple lifecycle model with endogenous retirement the composition of household balance sheets should not matter. The fundamental tradeoff in such a model is between lifetime consumption and lifetime leisure, and thus the only thing that should matter for the decision to retire at a given age is total wealth—the present value of all future retirement income claims and marketable wealth (less debts)—relative to optimal consumption. It should not matter what form the wealth takes, meaning non-retirement financial or tangible assets, defined contribution (DC) or individual retirement accounts (IRAs), debts (entering negatively), or the present value of future Social Security and defined benefit (DB) pension benefits. If the lifecycle decision-maker is smoothing consumption, the only question to be answered is whether or not they have accumulated sufficient wealth to continue at their optimal consumption through the end of the lifecycle. In principle, even in a stochastic environment, individuals continuously adjust consumption and retirement age to balance the competing objectives.

The simple lifecycle model leads to a number of empirical puzzles, however. For example, the annuitization puzzle references the fact that most people do not convert their wealth to annuities, which is the optimal strategy for maintaining certain consumption over an uncertain lifespan. There is also a well-known puzzle about non-annuitized wealth, because the available data suggests most people do not systematically draw down their wealth as they get older, which

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1 Goldin and Mitchell (2017) show the same basic upward trends hold for women, even considering cohort-level changes in labor supply at various lifecycle phases. The upward trend is subject to cyclical variation, however. For example, Coile and Levine (2011) show that retirement hazards increased in the Great Recession, though Dudel and Myrskylä (2017) show that the cyclical effect varies across demographic groups.
is generally equivalent to saying that consumption unexpectedly declines at older ages. Finally, there are well-known spikes in retirement hazards at key ages associated with public social insurance programs. The retirement literature is filled with resolutions to the various puzzles, some of which question the empirical validity of the puzzle itself, and some of which focus on changes to the simple lifecycle model that solve the puzzle. The premise for this paper is that the role of household portfolios in both the empirical and theoretical explanations generally deserves more attention.

Despite the puzzles associated with the simple lifecycle models, standard retirement models are still primarily driven by the tradeoff between lifetime income and consumption, though with a forward-looking component. For example, Coile and Gruber (2007) compute the present value of future retirement income at every age for a sample of potential retirees, and show (as predicted by the simple lifecycle model) that the probability of retiring at a given age rises with retirement wealth at that age. However, they also compute forward-looking estimates of retirement wealth at every possible future retirement age. The probability of retirement at the current age falls with the gap between current and some higher future “peak” retirement wealth. The gap is largely driven by accrual rates in DB pensions, but there is also variation in Social Security accrual because of heterogeneity if lifetime earnings. On average, however, accrual rates in Social Security are relatively flat because of the program’s actuarial adjustments. Said differently, the results suggest that the simple tradeoff between lifetime leisure and consumption is basically correct, but people do not irrationally forego substantial actuarial benefits from delaying retirement.

Previous research suggests that household portfolio composition may be important for retirement decisions in ways that go beyond the simple lifetime consumption versus lifetime leisure tradeoff. One strain of the literature shows the importance of thinking about wealth in a

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2 Banks, et al (2019) show that non-medical consumption in both the UK and US trends down after retirement, though total spending in the US declines much less because of rising out of pocket health. This is consistent with the principles driving lifecycle saving in models such as De Nardi, French, and Jones (2010).

3 One recent paper that speaks to both empirical and theoretical resolutions to the various puzzles is Laitner, Silverman, and Stolyarov (2018). They develop an analytically tractable model with health shocks and realistic Medicaid that can explain both lack of wealth draw down in retirement (the less healthy draw down wealth but disappear from sample) as well as failure to annuitize (the healthy save for when health shocks hit).

4 A more comprehensive measure of accrual includes the effects of both lifetime taxes and benefits from additional work. See Goda, Shoven, and Slavov (2011).

5 This is also the general conclusion by Coile (2015) in her survey on the economic determinants of retirement. Most of the attention is on the effects of accruals because of rules in public and private pension plans.
comprehensive way. For example, Purcell (2012) and Mudrazija and Butrica (2017) show that the potential annuity value of assets like owner-occupied housing are substantial relative to the usual sources of retirement income. Farnham and Sevak (2016) complement those finding by showing that house price shocks affect retirement expectations, which would not be the case if individuals did not factor housing into their total wealth because they intend to simply continue living in the same house and get no value from leaving the house as a bequest.

Another strain of the retirement literature suggests that various components of wealth have differential effects on retirement. In a very direct test of the role of different pension types, Coile and Stewart (2019) show that public sector employees who are much more likely to have DB plans do indeed retire much earlier in all time periods. That could just mean public sector workers are wealthier. However, the trends toward later retirement and increased work at older ages for private and public sector workers are surprisingly similar, and during a period when private sector workers DB plans were effectively disappearing. Butrica and Karamcheva (2013, 2018) show that higher household debt is generally associated with more work at older ages. Although causation is highly problematic in these sorts of empirical observations, research by Coile and Milligan (2009) and Love and Smith (2010) suggest that the evolution of portfolios in retirement is largely driven by experiences like health shocks, as opposed to the alternative reverse causation, which would mean that the likelihood of health shocks determines portfolio composition.

One specific component of the household balance sheet that attracts a great deal of attention—especially given the widespread shift from DB to DC pensions—is equity holdings. Goda, Shoven, and Slavov (2012) show that the negative (but fairly weak) empirical correlation between stock market performance and retirement expectations is driven by factors correlated with stock prices, and not stock prices per se. This makes sense, because equity holdings are highly concentrated, even among near retirees. Explaining widespread changes in retirement behavior as the result of stock market swings would be counterintuitive, but it is straightforward to see how other economic conditions, such as the prospects of reemployment, are both salient and highly correlated with stock market outcomes.

The main contribution in this paper is to study retirement expectations using a new (for this purpose) data source with a comprehensive measure of household wealth and extensive detail on household portfolios. The Survey of Consumer Finances (SCF) is a triennial cross-
section focused on household balance sheets, but also has extensive information about incomes, demographics, and labor force experiences. The SCF sampling strategy is unique among public use household surveys, as about one-fourth of the sample is drawn from administrative data records in order to capture the top of the wealth distribution. This oversampling of high-wealth households, in addition to the detail on household portfolios make the SCF uniquely qualified to address questions about retirement decisions for the entire population. The two problems with using the SCF to study retirement behavior are the omission of Social Security and DB wealth, and the fact that the survey is a series of cross-sections, because in principle one needs a panel data set to study retirement behavior.

Thus, the first key data innovation here is to use SCF detailed work history and work expectations modules to create lifecycle wealth measures from the cross-section observations. One hurdle in constructing lifecycle wealth measures is to show that SCF respondents are giving reliable answers to key questions about labor force activity prior to the survey, along with unbiased estimates of expectations about future work. The actual lifecycle employment profiles are validated against external data sources, and expectations about future work on near-retirement respondents are shown to be internally consistent with actual retirement outcomes for retired respondents. Given the lifecycle wealth estimates and validated expected future work patterns, the correlation between retirement expectations and household portfolios can be evaluated for the group on the cusp of retirement.

Some background for the empirical findings involves the variability and composition of the comprehensive household wealth measure across permanent income groups as they approach retirement. The population being studied is respondents age 50 to 59 with a very high degree of labor force attachment (30 or more years of actual or expected full time work as of age 60) who report they expect to still be working full time at age 60, which is roughly half the population of all SCF respondents and spouse/partners in that age range. For that population, Social Security wealth is shown to dominate all other forms of wealth over much of the permanent income distribution. Other types of retirement wealth (DB and DC) become more important at higher

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6 See Bricker et al (2017) for a discussion of the SCF and the most recent results, for survey year 2016.
7 See Feiveson and Sabelhaus (2019), Bricker et al (2016), and Batty et al (2019) for a discussion of how well the SCF captures macro aggregates over time, and how the SCF results on wealth distribution compare to other studies based on a straight read of the administrative data.
income levels, and the high degree of concentration in non-retirement wealth, especially for wealth components such as closely held businesses, dominates the very top.

The main set of empirical findings then builds on those distributional observations, focusing on simple correlations between retirement expectations and portfolio composition. The approach is a hierarchical decomposition, beginning with the correlation between expected remaining full-time years of work (again, conditional on long careers and expected full time at age 60) and the comprehensive total wealth measure. The subsequent steps involve sequential decomposition of wealth into its various components, meaning Social Security, DB, and DC within retirement wealth, and financial assets, nonfinancial assets, closely held businesses, real estate debt, and other debt within non-retirement wealth. The correlations vary systematically across balance sheet components, but generally supporting the idea that higher wealth is associated with fewer expected remaining working years. Differences in point estimates for the correlations, along with exceptions such as the positive correlation between expected remaining working years and closely held business assets speak to the limitations of the simple lifecycle model with endogenous retirement. A related finding is that estimated year dummies for the eight SCF waves in the OLS regressions suggest that the decline in expected years of future work between 1995 and 2016 is not explained by the simple correlations.

The rest of the paper proceeds as follows. Section 2 describes the longitudinal work history and employment expectations in the SCF cross-sections. The longitudinal data is validated by showing that observed SCF employment survival and retirement hazards by age are consistent with other (true panel) data sources, and expected retirement hazards for respondents in their 50s are shown to be generally consistent with observed retirement hazards of respondents in their 60s. Section 3 focuses on estimating the two key missing pieces of household portfolios: the present value of future Social Security and DB retirement income flows. The composition of household balance sheets, both between retirement and non-retirement wealth but also within the more detailed categories of each type of wealth, are shown to vary systematically with the SCF measure of permanent income. Section 4 presents some preliminary OLS estimates of the correlations between retirement expectations and detailed household portfolios. Section 5 discusses next steps in this ongoing research agenda.
2. Longitudinal Work Histories and Retirement Expectations in the SCF

The Survey of Consumer Finances (SCF) has a unique and well-known place among U.S. household-level data sources because of the extensive detail about assets and debts and a high-wealth oversample based on administrative data. It is less well-known that the SCF also collects extensive work histories and expected future labor force participation for both the respondent and spouse/partner (if present) in the household. Thus, although the SCF is a series of cross-sections, it is possible to estimate retirement expectations models with comprehensive wealth measures by constructing a longitudinal representation based on these recalled and expected work histories. The focus of this section is on how the various SCF modules are used to construct the longitudinal measures, and to show how the patterns of actual and expected retirement behavior are internally consistent and consistent with other datasets.

SCF Labor Force and Work History Modules

The extensive income, asset, and debt information in the SCF would not be very useful for studying retirement if the survey lacked longitudinal observations for employment outcomes. The SCF data on labor force participation, employment, unemployment earnings, current job characteristics, past jobs, and expected future work are collected in detailed modules for both the respondent and spouse/partner (if present). The sequence of questions in the SCF labor modules focus first on current employment status, then (if employed) current main job characteristics, including pensions. That is followed by modules on employment histories, and finally questions about expected future work.

The idea of working versus not working is a simple idea for most survey respondents, but there are a variety of circumstances that can complicate the issue for some. Many respondents have multiple statuses: they are both working (full or part time) and a student, homemaker, volunteer, or some other status that is generally considered out of the labor force. The SCF instrument lists all of the possible situations, and then collapses (for the purpose of determining survey question sequence) people into three bins: not working, working full time, and working

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8 In SCF micro data files the respondent is always recoded to be the male in a different sex couple, and the individual closest to 40 years old in a same-sex couple. This underscores the use of data for both respondent and spouse/partner in the empirical work here, because there are many cases where the spouse/partner will actually be the primary earner.
part time. The information one would like about the individual varies with the bin, and the SCF survey instrument is tailored to the three groups accordingly.

If the individual reports working full or part time, they are asked a number of questions about their current main job. Many of these questions are standard in household surveys, including whether the respondent is self-employed or working for someone else, how much they earn through a regular salary and/or variable pay, their usual hours and weeks worked, their industry and occupation, and the size of the firm they work for. The key incremental information (relative to most cross-sectional data) that makes it possible to start building the longitudinal variables is that respondents are also asked when they started the current job, and when they expect to stop working on the current job.

After the current job data is collected, the survey turns to work histories. There are three distinct sequences of questions for individuals who report not working, working full time, and working part time. The goal of the survey instrument is to retrieve some common work history elements for the three groups, including the total number of years worked full time and part time, and details about the longest full-time job ever worked. The longest job questions are a subset of the information collected about the current main job, including salary in the last year they worked the job, industry, occupation, and self-employed versus working for someone else. The question sequences vary by current work status because of the frame of reference for different types of respondents. For example, the leading question “have you ever worked full-time?” will only make sense to respondents who are currently not working or working part-time.

Even with carefully tailored question sequences there is still some respondent confusion about and disagreement among the various work history responses that must be addressed in the data construction. For example, one common tendency is for respondents to confuse current main job “type” with their current employer. If they have been working the same type of job their whole adult life, they will sometimes answer that they started the current job at a young age, even though the earlier job(s) they are thinking about involved a different employer. The self-employed are particularly prone to answering they have been in the job since childhood, though in their case many of them work in family businesses all their lives. Building the longitudinal work histories requires a balancing of sometimes conflicting information from the

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9 The survey also collects limited information about second jobs, but that is not used for purposes of classifying work status.
current job, the longest full-time job, and the overall number of years worked full and part time.\textsuperscript{10}

The estimated retirement models here are based on what respondents report they expect to do in the future, and thus the questions on future work are crucial. Again, the specific questions vary with current work status, but the general idea is to divide the future into periods of expected full time, part time, and not working. The majority of the working population—those who are working full-time in the survey year—are the easiest, because the survey instrument simply focuses on when they expect to stop full-time work, whether they expect to switch to part time after that, and if so, when they expect to stop working completely. The currently not working and working part time are first asked if they expect to start working full time before the rest of the question sequence kicks in. Again, there are sometimes conflicting answers vis a vis the current main job, situations where the respondent initially says they “never expect to stop” doing the particular type of job they are in, but then later reveal that they actually do expect to stop working at a particular age. Reconciling those conflicting answers is key for generating patterns of expected retirement that are both consistent with observations from other data sets and the actual (as recalled) retirement behavior of older respondents in the SCF itself.

\textit{Actual and Expected Retirement in the SCF}

Retirement means different things to different people. Some people think of retirement as exiting a lifetime career job, while for others, it might mean completely exiting the paid labor force. The three SCF employment bins (not working, working full time, and working part time) are the basis for two distinct retirement definitions used here. The first definition focuses on full-time work, and the second definition focuses on any work, including part-time. Among full-time workers at age 60, roughly three-fourths have stopped working full-time by age 70, and about half have exited from any work, suggesting that full to part time transitions are important.

For both the full time and any work retirement definitions, it is possible to construct survival rates (probability of remaining in a given status) and transition hazards (moving to the next, absorbing status) for both an “expectations” sample of people 50-59, and a “recall” sample of people 60-69. The expectations and recall samples are selected in ways that make them comparable subsets of the population. The samples are each approximately fifty percent of all

\textsuperscript{10} The code that reconciles the various employment history variables is available from the author upon request.
(weighted) respondents and spouse/partners in their respective age groups, comprised of individuals with 30 or more years of full-time work who are working full time at age 60.\textsuperscript{11} The expectations sample is so named because their retirement survival and hazard rates are based on expectations of future work, while the recall sample is reporting their actual labor force history (through their current age, which is again, between 60 and 69) and expectations thereafter.

Figures 1 and 2 show SCF survival rates for the full time and any work retirement concepts, for the entire sample (1995 to 2016) and two subperiods (1995-2004 and 2007-2016).\textsuperscript{12} The key takeaway from both figures is that the expectations and recall samples are in broad agreement about rates of labor force exit for respondents in their 60s, and about increased survival rates across the sub-periods. A closer look suggests the recall sample survival rates are smoother, consistent with people ages 50-59 in the expectations sample reporting they expect to retire at well-known spikes (ages 62 and 65). In practice the actual age at which the individual last worked is smoother (more mass at 61, 63, 64, and 66). At least some of the smoothness is due to conflated calendar year versus age question framing in the SCF. Other than a tendency for age 50 to 59 respondents to overestimate how much they will work part-time in their late 60s, the expectations and recall outcomes line up very well, providing internal validation.

The other key validation exercise for the work expectations modules involves expected retirement hazard rates, which are—conditional on still working at a given age—the probability of not working at the next age. Figures 3 and 4 show hazard rates for the expectation sample, first for full time work, and then for any (full or part time) work. The shapes of the retirement hazards are well-known in the literature, with large spikes at ages 62 and 65 (Coile, 2015). The shapes for full time and any work appear very similar, but the vertical scales are very different, and consistent with the very different survival patterns above. In addition, the retirement hazard spikes in the second sub-period (2007 to 2016) are diminished at ages 62 and 65 relative to the first subperiod (1995 to 2001), and the hazard rate at age 67 appears to be rising in a manner consistent with other recent estimates (Coile and Stewart, 2019). Thus, the SCF work expectations variables are capturing the outcome of interest.

\textsuperscript{11} The expectations sample criteria subtracts one year for each age below 60, so, for example, a 55 year old qualifies with 25 years of full-time work.

\textsuperscript{12} The labor force survival and hazard estimates in Figures 1 to 4 are all weighted, with SCF sample weights adjusted for cohort mortality by age and sex, and differential mortality adjustments by permanent income, education, marital status, and race, using the method explained in detail in the next section. Mortality adjusted weights make the cross-sectional survival and hazard rates more consistent with observations from panel data sets.
Source: Survey of Consumer Finances. Expectations sample is ages 50-59 in survey year, with expected full-time work at age 60 and 30 or more years of full-time. Recall sample is ages 60-69 in survey year, having worked full-time at age 60, and 30 or more years of full-time work.
Figure 3. Hazard Rates, Expected Exit from Full-Time Work

Figure 4. Hazard Rates, Expected Exit from Any Work

Source: Survey of Consumer Finances. Sample is ages 50-59 in survey year, with expected full-time work at age 60 and 30 or more years of full-time.
3. Retirement Wealth and Other Balance Sheet Components

Future employment outcomes are the key dependent variables in the retirement expectations models estimated in the next section, but estimating such models also requires retrospective and predicted longitudinal information to construct key independent variables. The models estimated below are based on respondent-reported expected retirement outcomes, using the “expectations” sample described in the previous section. Accordingly, the relevant independent variables are expected values (as of the survey year) as well. This section describes the independent variable construction, beginning with mapping the relevant cross-section variables into a longitudinal representation using a model of differential mortality. The discussion then turns to constructing the Social Security and DB wealth estimates, and finally, the other key balance sheet components used in the retirement expectations models.

Demographics and Differential Mortality

The data construction begins with the same basic set of demographic controls generally available in a longitudinal household panel like the HRS. The usual list of demographic controls is available on the SCF cross sections, including variables like age, marital status, education, permanent income, industry, and occupation. The demographic variables are available for both the SCF respondent and the spouse/partner, which is important, because the SCF micro files always assign the male in a couple (person closest to age 40 in a same sex couple) to be the respondent, and the other individual to be the spouse/partner, without regard to which of the two is the primary earner. The retirement expectations models in the next section are estimated for single respondents and the primary earner (meaning higher earner, as of the survey year) within the couple (assuming they also meet the longitudinal employment criteria).

In addition to serving as basic controls in the retirement expectations equations, the core demographics are key to estimating present values for retirement income streams through a differential mortality adjustment. Constructing the present value of Social Security and DB pension incomes requires survival probabilities, which are computed through age 99. The starting point for the survival adjustments used here to transform data from the cross section to the longitudinal structure is Social Security Administration cohort mortality by age and sex. The second step is a differential mortality adjustments based on the results of a study that combined
administrative earnings, demographics, and mortality data. The differential mortality model was developed by the Congressional Budget Office (CBO) for use in their long-term Social Security model (CBOLT). The key mortality-differentiating demographic variables are quintiles of permanent income, education, marital status, and race. The appendix to Feiveson and Sabelhaus (2019) explains how the CBOLT model parameters can be calibrated to the SCF data in a way that preserves relative mortality across the lifetime earnings and four demographic groups for any given age, sex, and cohort population group. The net effect of the differential mortality adjustments is that an economic variable like total wealth, which is not explicitly controlled for in the mortality adjustments, is strongly negatively correlated with differentiated mortality after controlling for age and sex.

Social Security Wealth

The largest component of retirement wealth for most families (and thus a key independent variable in the retirement expectations models) is the present value of Social Security benefits, or Social Security wealth (SSW). The seminal paper by Coile and Gruber (2007) used Social Security earnings records linked to the Health and Retirement Study (HRS) panel in order to estimate SSW at each point in time for each household. Using such data, the interaction between the lifecycle pattern of SSW and retirement behavior can be studied through the lens of a fully specified retirement model. The estimates of SSW developed here—based on the SCF cross-section labor force recall and expectations modules and projected to age 60—are somewhat more limited than what is available from panel surveys like the HRS, but the patterns of SSW over the relevant age range are similar.

The value of SSW for a given individual at a given age involves their earnings history, birthyear, calendar year, Social Security benefit parameters, and an assumed discount rate. The SSW values in the retirement expectations models are based on a very simple transformation of current earnings and the work history/employment expectations modules in the SCF. The work history module has good information about whether the individual worked at a given age, and if

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15 In particular, the age-pattern of median SSW is consistent with the results in Gruber and Coile (2007).
16 The SSW and DB wealth estimates here all assume a real discount rate of 3 percent.
so, whether that employment was part time or full time. The simple transformation of current earnings involves adjusting survey year nominal earnings for changes in the Social Security Average Wage Index (AWI) and then for part time versus full time status. This effectively assumes stickiness in relative earnings over the lifecycle, with no differences in age-earnings profiles across different types of individuals.\textsuperscript{17}

Projecting SSW to age 60 is key to estimating the expectations-based retirement models. Before describing the projections, note that in the SCF survey year, and for years before the survey, the SSW for a given individual at a given age is simply the present value of future Social Security claims earned by that individual as of that age, so it depends only on what has already happened. The sequence of calculations to generate SSW follows the Social Security rules, which means (1) identifying the highest 35 AWI-adjusted earnings years after limiting earnings to the calendar year Social Security Contributions and Benefit Base (TAXMAX), (2) computing Average Indexed Monthly Earnings (AIME) based on the highest 35 years of earnings, (3) computing the Primary Insurance Amount (PIA) based on the AIME and the birthyear-dependent PIA bend points, and (4) computing the payable benefit using the PIA, assumed benefit age, and birth year (to account for changes in the Full Retirement Age, or FRA). For survey respondents with fewer than 10 years of qualifying earnings, SSW is zero because they are not yet eligible for a benefit.\textsuperscript{18}

The value of SSW for years after the survey year involves projecting earnings through that future year, recomputing the Social Security benefit associated with working through that future year, and finally recomputing the present value of benefits as of that future year. This is a mechanical application of the same earnings adjustments used for the retrospective calculations, most notably, using the AWI to create nominal earnings and subjecting those to the relevant TAXMAX. The only other assumption required—as it was for the retrospective SSW calculations—is that benefit claiming coincides with retirement or occurs at age 62, which ever is greater. Again, this is consistent with computing the present value of benefits as of a given

\textsuperscript{17} Constructing more realistic age-earnings profiles is the crucial next step in this research. There is unused information in the SCF job history modules about past earnings, industry, and occupation that can help predict past earnings, as well as information about the relationship between current and permanent earned income at the time of the survey. See Jacobs, et al (2019) for an explanation of how some of that incremental information can be brought to bear.

\textsuperscript{18} The SSW calculations here consider only retired worker benefits. Disabled workers (as of the survey year) are ruled out by the sample selection criteria. Incorporating spousal and survivor benefits is another crucial next step in this research.
An individual who stops working at age 60 has an SSW value at age 60 (what will become their age 60 SSW value in regressions) that is the present value as of age 60 for a stream of benefits that begins at age 62.\footnote{The same method can be used to construct a value of SSW for the individuals at successive ages who report that they expect to continue working through those ages. For example, the SSW value at future age 61 for an individual differs from that of the same individual at future age 60 because there is an additional year of earnings in the benefit calculation, and because the discounting of future benefits is back to age 61 instead of age 60. The stream of benefits is still assumed to begin at age 62, however, so the number of (mortality adjusted) benefit payments for an age retirement age is identical to the age 60 retirement age. For individuals who report they expect to continue working after age 62, SSW is affected by the incremental year of earnings, discounting back to the higher retirement age, and the assumption that benefit claiming begins at the greater of age 62 or the retirement age.}

**DB Pension Wealth**

As with Social Security, the wealth equivalent of a stream of future DB pension incomes is a survival-adjusted present value. Those wealth equivalents are constructed using survey information about currently received pension benefits, expected future pensions, and pensions associated with current jobs, using the same differential mortality model and discounting assumptions applied to SSW above. The sum of all pension wealth is benchmarked to the aggregate from the Financial Accounts of the United States (FA), and the distribution of pension wealth is benchmarked against direct measures from the HRS. Details of the DB wealth estimates used here follow, and see also Sabelhaus and Henrigues-Volz (2019).

The SCF collects comprehensive detailed information about retirement plans associated with current and past jobs of the respondent and their spouse or partner. The measure of wealth consistent with the comprehensive household balance sheet is the present value of those future DB benefits, which is equivalent to the value of the financial assets held now that will be liquidated over time to pay the promised stream of DB benefits when those liabilities come due. The SCF collects details about DB pension benefits in three different survey modules. The three categories cover DB benefits already being received, DB benefits associated with a past job where the known benefit amount will be received at a specific future date, and DB benefits associated with a current job, where the ultimate benefit will depend on how much longer the worker is covered by the plan and their final salary.

The survey questions about currently received benefits and expected benefits from past-job pensions are standard. The respondent is simply asked how much is currently being received, or how much will be received when the benefit begins. For our purposes, these streams of benefit...
payments are the input to an actuarial present-value calculation that also involves an assumed interest rate and respondents’ expected longevity (which is again, differentiated). This present value calculation is the level of financial assets that the retirement plan sponsor must hold to pay promised benefits and, thus, corresponds directly to the household wealth measure we are trying to capture. In total, these present value calculations for SCF respondents indicate that about 40 percent of the aggregate DB pension assets in the FA is attributable to the promised benefits of currently receiving and past-job pensioners, and thus the remainder is accounted for workers still in the jobs for which they are accumulating the rights to future DB benefits.

Calculating DB pension wealth for workers (who, by construction, dominate the “expectations” sample here) covered by a plan on their current job is more complicated than for the first two cases, because the benefit that will eventually be received is unknown as of the survey date, and in any event, that benefit is likely different from the FA benchmark concept. The SCF asks a series of questions about current job DB pensions, including how long the worker has been in the plan, when they expect to receive benefits, and how much they expect to receive after benefit payments begin. These questions make it possible to construct a few different measures of what the stream of future benefits represents in present value. For example, it is possible to compute the present value of the future benefit stream assuming the worker remains in the job until his or her expected retirement age, for a given projected final salary, and under the assumption that the worker knows and reports values consistent with the actual benefit formula in the survey. DB benefit formulas are generally based on a complicated combination of years of service and average “high” salary, and those formulas are generally beyond the grasp of survey participants. Of course, if constructed properly, this “continuation” value of the DB pension is an important and useful concept when thinking about lifecycle financial planning.

The continuation value represents what the DB pension could be worth to the worker at some point, based on a series of assumptions about future employment and earnings under the current plan rules. However, the measure of DB wealth that corresponds to total household wealth in the FA is the narrower financial liability of retirement plan sponsors, the DB wealth that the worker has accumulated to date. Plan sponsors are not required to set aside the continuation value of a pension for every worker in their plans. Rather, DB plans are required to hold only the present value of benefits already earned by the worker, the “termination” value that corresponds to DB wealth in the FA. The termination value represents the worker’s legal claim
to DB wealth, because that level of assets is equivalent to the present value of benefits they will actually receive if their plan coverage ended today. The termination value of a DB pension is always less than or equal to the continuation value, and the two converge as the worker approaches retirement age, at which point they are equal by definition.

Thus, the approach to solving for DB pension termination values for current workers in the SCF relies on three complementary sources of information. The first piece of information is the aggregate value of DB pension assets from the FA. After subtracting the roughly 40 percent of total assets accounted for by currently received and known future benefits (as described above), the remainder represents the legal claims (termination values) of current job DB participants. The second set of inputs, from the SCF, is the age, accumulated years of plan coverage, earnings, and sector (private or public) of the job held by the worker. Finally, the calculation involves data from Fang, Brown, and Weir (2016) from HRS to parameterize and validate our estimated person-level termination values. After building in the observable wedge between public and private sector DBs (public plans are more generous than private, relative to earnings), the actuarial present value calculations used to construct termination values are based on the same differential mortality model applied to SSW.

Other Balance Sheet Components

The two principal advantages of using the SCF to study household behavior are the high-wealth oversample and the focus on comprehensive measures of income and balance sheet components.20 Those advantages are reflected in the benchmarking exercises in Sabelhaus and Feiveson (2019) and Batty, et al (2019) that show aggregated SCF assets and liabilities line up well with the corresponding categories in the FA. Indeed, the only missing component in the SCF relative to the FA is the present value of DB benefits. The key missing balance sheet component in both the micro and macro data is the present value of Social Security benefits (SSW). Both DB wealth and SSW are discussed above, and the question for this section is how

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20 Another key but often neglected advantage to using the SCF is the extensive interconnectedness between income and balance sheet components in the survey instrument that greatly improve data quality. For example, respondents may initially report no owned businesses, but then later in the survey reveal that they think of themselves as self-employed, which triggers reconsideration of the owned business questions. Similarly, the existence of various types of DB pensions and DC/IRA accounts is checked in various ways throughout the survey, as respondents are asked at various points about coverage, balances, and benefits/withdrawals in different ways. The extensive SCF case review process undertaken by Federal Reserve Board staff is largely focused on sorting through what is sometimes conflicting information about these complicated balance sheet items in the raw data.
those estimated retirement benefit components compare to and vary with the published SCF wealth measures across permanent income groups.

The addition of SSW and DB pension wealth to the conventional SCF measure of household net worth increases total wealth for the well-attached “expectations” sample population by over 60 percent (see the appendix tables). The per-adult average for total wealth in the “expectations” sample is $917,144, which is 10.8 times the value of average permanent income for the group (Table 1). Although the per-adult wealth levels vary dramatically across permanent income groups, the ratios of average total wealth to average permanent income by permanent income are in a fairly narrow range between 10 and 12.

The lack of systematic variability in average wealth relative to average permanent income—for this population of well-attached individuals still working at age 60—suggests that different income groups attain the same level of overall relative retirement preparedness, though possibly in different forms of wealth. This is on the surface at odds with the other observation in Table 1 that expected remaining full-time working years—the dependent variable in the regressions below—is negatively correlated with permanent income. It may make sense that higher permanent income individuals expect to leave their full-time jobs at younger ages, but the ratios of total wealth to permanent income are inconsistent with a simple lifecycle story.

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21All dollar values are converted to 2019 dollars based on the same CPI series used in the Social Security benefit calculations. Per-adult means household values for single individuals, and household values divided by two for couples. Sample weights for sorting and statistical purposes are adjusted accordingly, meaning a given permanent income decile has 10 percent of the individuals, not 10 percent of the households.
Source: Survey of Consumer Finances. Sample is ages 50-59 in survey year, with expected full-time work at age 60 and 30 or more years of full-time.
The composition of household balance sheets varies dramatically with permanent income (Figures 5 and 6). The observation from Table 1 that overall average wealth is stable relative to permanent income is repeated in Figure 5, as the overall height of the bars (the ratio of average total wealth relative to average permanent income) lie in a fairly tight range. Splitting out the top 1 percent (by permanent income) shows that most of the top decile (percentile groups 90 to 99) look more like the permanent income groups just below them than the top 1 percent. The decline in average wealth relative to average permanent income at the very top indicates that skewness in permanent income dominates skewness in average wealth given permanent income—it does not mean that permanent income is more unequal than wealth.

The more informative story in Figure 5 is the way in which portfolio composition varies with permanent income. Figure 5 disaggregates wealth into the three retirement components (Social Security, DB, and DC wealth) along with all non-retirement wealth. The clear message of Figure 5 is that the relative importance of all retirement wealth declines with permanent income, and within that declining pattern, Social Security declines as a share of total retirement, meaning DB and DC become relatively more important. Social Security is, however, a crucial component of total wealth (a third or more) for the entire bottom half of the permanent income distribution, and retirement wealth generally dominates non-retirement wealth for all but the top decile. For the top 1 percent by permanent income, total retirement wealth accounts (on average) for a very small (about 10 percent) overall portfolio share.

The non-retirement piece is basically all SCF net worth except DC, which is the one piece of retirement wealth collected directly in the SCF. Non-retirement wealth is dominated by non-financial assets like real estate and vehicles, especially for lower permanent income groups. As with retirement wealth relative to total wealth, non-financial dominates all non-retirement for all but the top decile of permanent income (Figure 6). The observation that “most families hold little liquid wealth” is corroborated by the averages of financial wealth relative to income in all but the top decile. Also, perhaps surprisingly, average debt relative to permanent income does not vary dramatically with permanent income, but that could be a function of the sample selection that excludes many financially stressed families. At the very top of the permanent income distribution financial assets and closely held businesses dominate non-retirement wealth (and, as noted above, non-retirement wealth dominates total wealth at the very top as well).
4. Household Portfolios and Retirement Expectations

The observations about average retirement expectations and average portfolio composition by permanent income in the previous section set the stage for the simple empirical exercise of estimating the correlation between varies wealth measures and retirement expectations. The main questions addressed in this section are (1) whether retirement expectations vary systematically with total wealth (2) whether retirement expectations vary with household wealth composition, and (3) whether controlling for wealth helps to explain trends towards later retirement over the 1995 to 2016 period covered by the SCF data. Although the empirical framework precludes making statements about causal effects, the estimated correlations are instructive about the interplay between wealth and retirement expectations.

The empirical approach involves a series of simple OLS regression relating the expected number of remaining years full-time as of age 60 (the means of which are in the second to last column in Table 1) to various wealth measures. The population is the primary earner in same well-attached “expectations” sample, age 50 to 59 workers with 30 or more years full time as of age 60 and still working full time as of age 60. Thus, the sample excludes early retirees from long career jobs as well as individuals with spotty or no labor force attachment, including those on disability insurance. In addition to the wealth measures, additional controls in the equations include permanent income, year dummies, sex, education, number of years worked full time, marital status (married includes living with a partner in the SCF), whether the spouse (if present) is working, the age gap between primary earner and spouse, industry dummies, and occupation dummies. In total, there are over 25,000 observations in the 1995 through 2016 SCFs that meet the inclusion criteria, but only the fifth implicate of the multiply imputed data set is used in order to get more accurate standard errors, so the final sample size is 5,665.

The OLS regressions begin with total household wealth as the key independent variable, and sequentially disaggregate wealth in order to identify whether there are obvious differences in the correlations between retirement expectations and the different components of household portfolios (Table 2). The regressions show the expected negative and significant correlation between total wealth and expected remaining years of full time work (column 1), though the correlation is small. The coefficient suggests that for every $10,000 in additional wealth, expected remaining full-time work years fall .0005. Thus, for a respondent in the middle of the permanent income distribution, with average wealth of about $500,000, a 20 percent increase in
wealth is associated with only a decrease in working of .005 years, or two days. Of course, this coefficient is not an estimate of the causal relationship, but the magnitude is nonetheless surprisingly small.

The second question is whether different components of total household wealth are differentially correlated with retirement expectations. Working across the columns of Table 2, it is clear that there are notable differences in the correlations. Simply dividing wealth into retirement and non-retirement components introduces a dramatic wedge, with the coefficient on retirement wealth more than thirty times the magnitude of the coefficient on total wealth, and the coefficient on non-retirement wealth not distinguishable from zero. Splitting wealth into retirement and non-retirement components also nullifies the observed negative correlation between expected retirement and permanent income, which was significant and an order of magnitude greater than the estimated wealth correlation.
Continuing across the columns of Table 2, one sees that Social Security wealth has a stronger correlation with retirement expectations than employer-sponsored retirement wealth, and within the employer-sponsored retirement wealth, the DB coefficient is only slightly above DC, which runs counter to the idea that the shift from DB to DC can explain longer working lives. The final regression (column 5) shows that various components of non-retirement wealth have very different correlations with retirement expectations, with debt standing out in terms of magnitude, and nonfinancial assets next. Financial assets are essentially uncorrelated, and the value of closely held business (controlling for self-employment) goes the wrong direction.

The third question posed to the simple regression framework is whether controlling for wealth—either total or disaggregated wealth—can help explain the increase in working years since 1995. The answer, as reflected in the year dummy coefficients in Table 2 and illustrated in Figure 7, is a convincing “no.” The figure, in particular, shows that the average unexplained expected remaining full time years in regressions with all of the other controls and then with or without detailed wealth components are roughly the same. Indeed, adding wealth in this simple regression framework, if anything, deepens the mystery about longer working years.
5. Next Steps

The results of this nascent effort to develop comprehensive wealth measures for SCF households and then study the correlation between wealth components and retirement behavior are promising. The eventual goals of this research agenda are to better understand how households manage their saving and borrowing decisions leading up to retirement, and how the various types of accumulated wealth ultimately bear on the decision to leave a career job and/or the decision to leave the labor force entirely. The causation runs both ways of course, and any serious empirical work has to acknowledge that shocks to wealth (along with shocks to health and other key retirement determinants) will affect retirement plans. Pursuing this agenda will involve continuing the empirical work described here in at least three complementary directions.

The first step going forward is to refine and benchmark the Social Security and DB wealth estimates presented here. That involves constructing more realistic age-earnings profiles, based on some of the unused information in the SCF job history modules about past job earnings, industry, and occupation. In addition, there is unused information about unemployment spells and other reasons for divergence between current and permanent earned income at the time of the survey. There are also key components of Social Security (survivor and spousal benefits) that are important for many near-retirees, and the information needed to estimate those auxiliary benefits is available on the SCF. The DB wealth estimates can also be refined in some cases using additional plan characteristics in the SCF labor force modules. Finally, both Social Security and DB wealth estimates should be benchmarked against comparable values from the HRS to make sure the estimated wealth values are unbiased and representative.

The second step is to move the estimation into a longitudinal framework, such as in the seminal work of Coile and Gruber (2007). The estimated Social Security and DB wealth as well as the SCF balance sheet components shown here are for a point in time, but there is information in the survey that makes it possible to understand and estimate how the various components are evolving over time. In the case of Social Security and DB wealth, the same approach to estimating the point in time measures can be used to estimate counterfactual values, meaning the present values of expected benefit streams as of some future retirement age. Indeed, preliminary work with the SCF work expectations yields estimates for the age pattern of Social Security wealth and probit coefficients on Social Security wealth accrual that are similar to the findings in papers (like Coile and Gruber (2007)) based on true panel data sets.
The SCF also collects the information needed to make inferences about how other key components of household balance sheets are evolving before and after the survey. For example, in addition to balances in DC accounts and IRAs, the survey collects information about employer and employee contributions into the accounts, along with withdrawals out of those accounts, so it is possible to estimate rates of accumulation or decumulation. Also, on the debt side, the extensive detail about loan terms makes it possible to reliably separate current loan payments into interest and principal repayment. Housing and vehicle assets (and the associated debts) are also measured at a point in time, but details about the transactions (including dates of purchase) make it possible to track and predict flows before and after the survey. These various balance sheet flow measures are crucial for a more dynamic empirical strategy, because it becomes possible to map out trajectories for recent wealth and expected future wealth under assumptions about future saving and borrowing. These expectations can be used (as argued above) in a model of expected behavior. In addition, the dynamic framework need not be limited to an approach like studying the “expectations” sample behavior several years into the future. It may make more sense to use a recall approach with reconstructed household balance sheets.22

Addressing the key questions about wealth and retirement posed in the introduction also requires a third step in the research agenda going forward, which is introducing variation in household consumption in a way that is consistent with lifecycle planning models. The controls for permanent income here are a first step in that direction, because the relevant wealth levels for different near retirees depends on their pre- and post-retirement consumption, which is correlated with (and assumed to be smoothed with respect to) permanent income. The SCF has a number of questions about spending on food, housing, and vehicles that are a good starting point for measuring household spending. There is also extensive demographic information about other family members in the household and interfamily transfers made and received outside the household.23 Thus, as with the household balance sheet items, it is possible to estimate consumption trajectories as well as point-in-time survey snapshots.

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22 In principle it would of course be preferable to observe balance sheets over long periods of time, but that leads to a whole new set of measurement problems. For example, it may seem tempting to analyze saving by first differencing wealth levels in a panel data set (Bosworth and Smart, 2009). However, these wealth-differenced estimates are noisy for a couple of reasons. First, (non-administrative) panels such as the Health and Retirement Study (HRS) and Panel Survey of Income Dynamics (PSID) do suffer from some attrition over time, which is not a problem in a cross-section. Second, the tendency to round estimates like account balances introduces multiplicative measurement error into first-differenced estimates of the balances in those account.

23 See Feiveson and Sabelhaus (2018, 2019) for a discussion of interfamily transfers in the SCF.
6. References


Jacobs, Lindsay, Elizabeth Llanes, Kevin Moore, Jeffrey Thompson, and Alice Henriques Volz. 2019. “Wealth Distribution and Retirement Preparation Among Early Savers,” Federal Reserve Board of Governors.


### Table A1. Income and Detailed Wealth Components by Permanent Income Percentile Group

<table>
<thead>
<tr>
<th>Permanent Income Percentile Group</th>
<th>Per Adult Averages</th>
<th>All</th>
<th>Social Security</th>
<th>Defined Benefit</th>
<th>Defined Contribution</th>
<th>All</th>
<th>Financial Assets</th>
<th>NonFinancial Assets</th>
<th>Closely Held Assets</th>
<th>Real Estate Debt</th>
<th>Other Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 10</td>
<td>17,328</td>
<td>208,293</td>
<td>137,418</td>
<td>111,389</td>
<td>19,259</td>
<td>6,770</td>
<td>70,875</td>
<td>8,406</td>
<td>68,852</td>
<td>17,489</td>
<td>-19,019</td>
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<td>11 to 20</td>
<td>27,486</td>
<td>294,348</td>
<td>206,529</td>
<td>142,714</td>
<td>45,219</td>
<td>18,596</td>
<td>97,200</td>
<td>15,120</td>
<td>88,900</td>
<td>12,846</td>
<td>-21,411</td>
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<td>21 to 30</td>
<td>34,739</td>
<td>359,084</td>
<td>258,057</td>
<td>169,626</td>
<td>66,431</td>
<td>22,000</td>
<td>101,027</td>
<td>17,892</td>
<td>106,243</td>
<td>14,917</td>
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<td>31 to 40</td>
<td>41,811</td>
<td>470,762</td>
<td>337,260</td>
<td>180,721</td>
<td>107,542</td>
<td>40,997</td>
<td>133,901</td>
<td>29,789</td>
<td>135,452</td>
<td>19,400</td>
<td>-40,377</td>
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<tr>
<td>51 to 60</td>
<td>58,649</td>
<td>651,651</td>
<td>456,624</td>
<td>228,385</td>
<td>165,985</td>
<td>62,844</td>
<td>185,027</td>
<td>42,265</td>
<td>182,461</td>
<td>37,325</td>
<td>-55,697</td>
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<tr>
<td>61 to 70</td>
<td>69,744</td>
<td>738,141</td>
<td>518,087</td>
<td>249,742</td>
<td>171,279</td>
<td>97,066</td>
<td>220,054</td>
<td>57,262</td>
<td>211,794</td>
<td>39,571</td>
<td>-75,922</td>
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<td>71 to 80</td>
<td>85,127</td>
<td>949,171</td>
<td>618,491</td>
<td>274,612</td>
<td>224,109</td>
<td>119,770</td>
<td>330,680</td>
<td>91,223</td>
<td>266,703</td>
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<td>-88,411</td>
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<td>81 to 90</td>
<td>114,136</td>
<td>1,314,635</td>
<td>769,331</td>
<td>297,966</td>
<td>296,272</td>
<td>175,093</td>
<td>545,304</td>
<td>166,247</td>
<td>396,485</td>
<td>110,702</td>
<td>-114,007</td>
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<td>91 to 100</td>
<td>354,001</td>
<td>3,634,211</td>
<td>934,966</td>
<td>298,748</td>
<td>184,074</td>
<td>452,144</td>
<td>2,699,245</td>
<td>874,712</td>
<td>934,729</td>
<td>1,131,464</td>
<td>-213,092</td>
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<tr>
<td>Percentiles 90-99</td>
<td>239,832</td>
<td>2,690,608</td>
<td>901,066</td>
<td>301,711</td>
<td>191,921</td>
<td>407,434</td>
<td>1,788,542</td>
<td>554,551</td>
<td>756,012</td>
<td>692,788</td>
<td>-190,578</td>
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<tr>
<td>Top 1 Percent</td>
<td>1,381,531</td>
<td>12,126,641</td>
<td>1,240,071</td>
<td>272,087</td>
<td>113,452</td>
<td>854,531</td>
<td>10,886,570</td>
<td>3,756,154</td>
<td>2,543,187</td>
<td>5,079,540</td>
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<tr>
<td>All</td>
<td>85,305</td>
<td>917,144</td>
<td>464,893</td>
<td>217,524</td>
<td>142,095</td>
<td>104,874</td>
<td>452,251</td>
<td>133,185</td>
<td>254,504</td>
<td>148,071</td>
<td>-70,937</td>
</tr>
</tbody>
</table>

**Notes:** Based on SCF "expectations sample" which includes primary earner ages 50-59 with 30+ years full time as of age 60 and still working full-time at age 60.

### Table A2. Income and Detailed Wealth Components by Permanent Income Percentile Group (Relative to Permanent Income)

<table>
<thead>
<tr>
<th>Permanent Income Percentile Group</th>
<th>Per Adult Averages</th>
<th>All</th>
<th>Social Security</th>
<th>Defined Benefit</th>
<th>Defined Contribution</th>
<th>All</th>
<th>Financial Assets</th>
<th>NonFinancial Assets</th>
<th>Closely Held Assets</th>
<th>Real Estate Debt</th>
<th>Other Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 10</td>
<td>1.00</td>
<td>12.02</td>
<td>7.93</td>
<td>6.43</td>
<td>1.11</td>
<td>0.39</td>
<td>4.09</td>
<td>0.49</td>
<td>3.97</td>
<td>1.01</td>
<td>(1.10)</td>
</tr>
<tr>
<td>11 to 20</td>
<td>1.00</td>
<td>10.71</td>
<td>7.51</td>
<td>5.19</td>
<td>1.65</td>
<td>0.68</td>
<td>3.20</td>
<td>0.55</td>
<td>3.23</td>
<td>0.47</td>
<td>(0.78)</td>
</tr>
<tr>
<td>21 to 30</td>
<td>1.00</td>
<td>10.34</td>
<td>7.43</td>
<td>4.88</td>
<td>1.91</td>
<td>0.63</td>
<td>2.91</td>
<td>0.52</td>
<td>3.06</td>
<td>0.43</td>
<td>(0.85)</td>
</tr>
<tr>
<td>31 to 40</td>
<td>1.00</td>
<td>11.26</td>
<td>8.07</td>
<td>4.51</td>
<td>2.57</td>
<td>0.98</td>
<td>3.19</td>
<td>0.71</td>
<td>3.24</td>
<td>0.46</td>
<td>(0.97)</td>
</tr>
<tr>
<td>41 to 50</td>
<td>1.00</td>
<td>11.02</td>
<td>8.24</td>
<td>4.34</td>
<td>2.83</td>
<td>1.07</td>
<td>2.78</td>
<td>0.58</td>
<td>3.07</td>
<td>0.38</td>
<td>(1.04)</td>
</tr>
<tr>
<td>51 to 60</td>
<td>1.00</td>
<td>11.11</td>
<td>7.79</td>
<td>3.89</td>
<td>2.82</td>
<td>1.07</td>
<td>3.33</td>
<td>0.72</td>
<td>3.11</td>
<td>0.64</td>
<td>(0.95)</td>
</tr>
<tr>
<td>61 to 70</td>
<td>1.00</td>
<td>10.58</td>
<td>7.43</td>
<td>3.58</td>
<td>2.46</td>
<td>1.39</td>
<td>3.16</td>
<td>0.82</td>
<td>3.04</td>
<td>0.57</td>
<td>(1.09)</td>
</tr>
<tr>
<td>71 to 80</td>
<td>1.00</td>
<td>11.15</td>
<td>7.27</td>
<td>3.23</td>
<td>2.63</td>
<td>1.41</td>
<td>3.88</td>
<td>1.07</td>
<td>3.13</td>
<td>0.92</td>
<td>(1.04)</td>
</tr>
<tr>
<td>81 to 90</td>
<td>1.00</td>
<td>11.52</td>
<td>6.74</td>
<td>2.61</td>
<td>2.60</td>
<td>1.53</td>
<td>4.78</td>
<td>1.46</td>
<td>3.47</td>
<td>0.97</td>
<td>(1.00)</td>
</tr>
<tr>
<td>91 to 100</td>
<td>1.00</td>
<td>10.27</td>
<td>2.64</td>
<td>0.84</td>
<td>0.52</td>
<td>1.28</td>
<td>7.62</td>
<td>2.47</td>
<td>2.64</td>
<td>3.20</td>
<td>(0.60)</td>
</tr>
<tr>
<td>Percentiles 90-99</td>
<td>1.00</td>
<td>11.22</td>
<td>3.76</td>
<td>1.26</td>
<td>0.80</td>
<td>1.70</td>
<td>7.46</td>
<td>2.31</td>
<td>3.15</td>
<td>2.89</td>
<td>(0.79)</td>
</tr>
<tr>
<td>Top 1 Percent</td>
<td>1.00</td>
<td>8.78</td>
<td>0.90</td>
<td>0.20</td>
<td>0.08</td>
<td>0.62</td>
<td>7.88</td>
<td>2.72</td>
<td>1.84</td>
<td>3.68</td>
<td>(0.30)</td>
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<tr>
<td>All</td>
<td>1.00</td>
<td>10.75</td>
<td>5.45</td>
<td>2.55</td>
<td>1.67</td>
<td>1.23</td>
<td>5.30</td>
<td>1.56</td>
<td>2.98</td>
<td>1.74</td>
<td>(0.83)</td>
</tr>
</tbody>
</table>

**Notes:** Based on SCF "expectations sample" which includes primary earner ages 50-59 with 30+ years full time as of age 60 and still working full-time at age 60.