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TRENDS IN THE RETIREMENT PREPAREDNESS OF BLACK AND HISPANIC
HOUSEHOLDS IN THE US

Edward N. Wolff

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Trends in the Retirement Preparedness of Black and Hispanic Households in the US
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ABSTRACT

Retirement income security refers to the ability of households to provide an adequate stream of income during the period of their retirement from the labor force. Expected retirement income is based of four components: (i) standard non-pension wealth holdings, (ii) defined contribution (DC) pension holdings,(iii) actual or expected defined benefit (DB) pension entitlements, and (iv) actual or expected Social Security benefits. The first two components are converted into an annuity. All the data (except rates of return) for these calculations are available from the Survey of Consumer Finances. Results indicate that both Black and Hispanic households made remarkable progress in terms of mean and median retirement income, poverty reduction, and replacement rates from 1989 to 2007 in both absolute terms and relative to whites. However, for Black households, this was followed by a reversal of fortune from 2007 to 2019, with expected median retirement income declining, the projected poverty rate rising, and the projected replacement rate falling, though expected mean retirement income does rise. Hispanics also experienced a setback in mean retirement income but continued progress in replacement rates and reducing poverty from 2007 to 2019.

Edward N. Wolff
Department of Economics
New York University
19 W. 4th Street, 6th Floor
New York, NY 10012
and NBER
edward.wolff@nyu.edu

1. Introduction

Retirement income security refers to the ability of households to provide an adequate stream of income during the period of their retirement from the labor force. Retirement income security occupies the public debate on a regular basis. There has been, for example, periodic discussion over the possibility for Social Security privatization. What is largely absent from the discussion, though, is a broader perspective that puts Social Security benefits in the frame of retirement income security. Social Security's value and thus the options to reform it can only be fully understood when it is put in the larger context of all retirement savings. This requires an understanding of the retirement savings that households have accumulated, how this has changed over time and what role Social Security has played in these changes.

The first question is whether workers have saved enough for retirement. My results indicate that the retirement system in the U.S. outside of Social Security is a system with many holes, despite large tax incentives from the federal government for workers to save for retirement. Nearly one-fifth of households nearing retirement between the ages of 47 and 64 in 2007 had no retirement savings other than Social Security. In contrast, almost all households can expect to receive some benefits from Social Security.

Even among the households that have private pensions, savings are very unevenly distributed. Indeed, one of the most dramatic transformations over the last four decades has been the replacement of traditional defined benefit pension plans with defined contribution plans such as 401(k)s. This change-over has actually been detrimental to a large share of the working population.

Minorities have substantially less retirement wealth than their counterparts. Much of this inequality results from an uneven distribution of retirement savings outside of Social Security. The typical household in 2007 could expect more retirement income from Social Security than from its private defined contribution plan retirement savings. In addition, private pensions fell even behind other private savings in the spectrum of retirement preparedness.

How have retirement savings changed over time? Retirement savings generally improved from 1989 to 2007. The share of households that could expect to have retirement incomes that were less than the poverty line declined. Also, the share of households that could hope to replace at least three quarters of their projected income at age 64 with benefits from their savings in retirement rose from 1989 to 2007. Moreover, minorities saw larger improvements in retirement

preparedness than their counterparts, although they generally remained less well prepared in 2007 than white households. However, from 2007 to 2019, Black families experienced a reversal of fortune while Hispanic families also saw a reduction in expected mean retirement income but continued progress in replacement rates and reducing poverty.

My empirical analysis involves two steps. The first is a calculation of expected retirement income in 1989, 2001, 2007, and 2019. This is based on four components: (i) standard non-pension wealth holdings, (ii) defined contribution (DC) pension holdings, (iii) actual or expected defined benefit (DB) pension entitlements, and (iv) actual or expected Social Security benefits. The first two components are converted into an annuity. All the data (except rates of return) for these calculations are available from the Survey of Consumer Finances. The second step is a comparison of the expected income stream generated from different wealth holdings to two standards of adequate retirement income: the poverty level income and the ratio of final income replaced by retirement income. These measures allow us to assess whether households have saved enough for retirement and how this has changed over time. This article focuses on retirement income security by race and ethnicity.

This article is organized as follows. The next part, Section 2, provides a review of the literature on retirement adequacy. Section 3 introduces the accounting framework and discusses the sources of data used in the study. Sections 4.1 and 4.2 consider the methods used to measure retirement income adequacy. Section 4.3 provides details on expected retirement income over the period from 1989 to 2019 both overall and by race/ethnicity. 4.4 makes projections of the expected poverty rate at retirement and Section 4.5 of expected income replacement rates at retirement. A summary of results and concluding remarks are made in Section 5.

2. A Review of the Literature on Retirement Adequacy

Retirement adequacy addresses the question of whether working individuals will save enough to meet their needs during retirement. Pension accumulations, Social Security, and savings in non-retirement assets all play a role in determining whether accumulated wealth at retirement will be sufficient to meet retirement needs.

Measuring retirement adequacy is usually done by comparing predicted income at time of retirement with previous income (the so-called “replacement rate”). It should be noted that estimates of the replacement rate are quite sensitive to the choice of denominator. Some studies

use family income at the time of the survey, others use a measure of permanent income, and still others use actual (or predicted) income as of the age just before retirement.

Measurement of adequacy also depends on the standard used for adequacy. Calculations of retirement income adequacy typically relate retirement consumption to pre-retirement consumption in three possible ways. First, a household may be considered adequately prepared for retirement if it can maintain a similar real level of consumption as during its working years. Usually, 75 or 80 percent of pre-retirement income is considered adequate since the income needs of retirees are likely to be lower than those of workers (Aon Consulting, 2001). Households no longer need to save for retirement, taxes are lower, work-related expenses disappear, the family size of retirees is smaller than that of workers, and households eventually pay off their debt (McGill, et al., 1996). Second, retirement income adequacy may be defined as a constant nominal level of consumption during retirement as during working years. This means that consumption needs are expected to decline during retirement over time, but in a somewhat arbitrary fashion. Third, real consumption may decline if the marginal utility of consumption is held constant and uncertainty about income and life expectancy are introduced (Engen et al., 1999). As households must consider an uncertain future, their marginal utility of certain consumption today is higher than the marginal utility of uncertain consumption in the future.

Several studies document that household consumption generally falls after retirement compared to the time when the household is working. Banks et. al. (1998) use data from the British Family Expenditure Survey (FES) covering the years from 1968 to 1992 to document a significant decline in consumption among British households right after retirement. Moreover, they also find that this drop in consumption cannot be fully explained by a forward-looking consumption-smoothing model, like the life-cycle model, that takes into account expected demographic changes and mortality risk. Fisher et. al. (2005) used data from the U.S. Consumer Expenditure Survey covering the years from 1984 to 2003. They first show that as the definition of consumption is expanded from food expenditures only to more comprehensive definitions, the recorded decline of consumption at retirement decreases by more than half. However, even with the most comprehensive definition, they find that consumption expenditures fall by 2.5 percent when individuals retire and continue to decline at about a rate of one percent per year after that.

The decline in spending after retirement for the average household is sometimes called the “retirement consumption puzzle.” The reason is that in a standard life cycle model of savings,

it is typically shown that household welfare is maximized when consumption remains constant over the lifetime (see Modigliani and Brumberg, 1954, for the classic work on this topic). Thus, the drop in consumption just after retirement is viewed as a “puzzle.”

Hurst (2008) argues that collectively there is no puzzle with respect to the spending patterns of most households as they transition into retirement. In particular, the literature shows that there is substantial heterogeneity in spending changes at retirement across consumption categories. The declines in spending after retirement for the average household are limited to the categories of food and work-related expenses. Overall, the literature shows that the standard life-cycle model of consumption augmented with home production and uncertain health shocks does an adequate job in explaining the consumption of the average household after retirement.

Scholz and Seshadri (2009) argue that the choice of replacement rates should be theory-based. They use an augmented life-cycle model of household behavior to examine optimal replacement rates for a representative set of retired American households and relate optimal replacement rates to observable household characteristics. They first note that target replacement rates are usually thought to be less than 100 percent for three main reasons. First, upon retirement, households typically face lower taxes than they face during their working years, if for no other reason than Social Security is more lightly taxed than wages and salaries. Second, households typically save less in retirement than they do during their working years, so saving is a smaller claim on available income. Third, work-related expenses generally fall in retirement.

Their work also notes that low income households are thought to need higher replacement rates than high income households. Prior to retirement, tax rates are lower for low-income households than they are for high-income households. As a result, their reduction in taxes in retirement is smaller than the reduction experienced by high-income households. Moreover, low-income households save less than high-income households, so that the reduction in saving in retirement will be smaller for low-income households. The fact that taxes and saving fall less in retirement for low-income households than for high-income households suggests that their target replacement rate should be higher.

They also suggest that there are different choices of the pre-retirement income that can be used to compute replacement rates. The usual choice is average income over pre-retirement years. But replacement rates are sometimes defined using average income over the last five (or fewer) years of the pre-retirement period, with the idea that living standards may ratchet upwards

as people age. They argue that a natural alternative to replacement rates can be drawn from the life-cycle model, augmented to account for fundamental factors affecting most households, such as demographic changes and uncertainty about future earnings, medical expenses, and longevity.

Using HRS data they compute an average optimal replacement rate of 0.68 for the population as a whole on the basis of income averaged over the lifetime as the point of comparison and 0.57 on the basis of income averaged over the top five earnings years. Optimal replacement rates exhibit a U-shaped relation with respect to the lifetime income decile – highest at the top and the bottom and lowest in the middle. They also compute that optimal replacement rates are highest for those who graduated college and lowest for those with less than a high school degree.

A number of studies look at the changes of retirement income adequacy over time. Wolff (2002) find that the share of households between the ages of 47 and 64 that can replace less than 75 percent of their current income in retirement rises from 56 percent in 1989 to 61 percent in 1998. In comparison, Engen et al. (2002) find that retirement income adequacy changes little from 1995 to 1998. Smith (2003) finds using data from the PSID and the CPS that median after-tax income replacement ratios in retirement show an increasing trend, particularly since the early 1990s. Sorokina et. al. (2008), using data from the HRS for age group 51 to 56, calculate that both pension wealth and replacement rates fell between 1992 and 2004.

Wolff (2011), on the basis of the 1989 and 2007 SCF, finds substantial progress in overall mean retirement income, 75 percent replacement rates, and poverty reduction among households aged 47 to 64. He also finds that the expected mean retirement income of non-Hispanic whites in 2007 is 2.33 times as great as that of Blacks and Hispanics (who are grouped together in this work). However, this ratio is substantially down from 2.68 in 1989.

Poterba (2014) reports that elderly individuals exhibit wide disparities in their sources of income. For those in the bottom half of the income distribution, Social Security is the most important source of support. Income from private pensions, assets, and earnings are relatively more important for higher-income ones who have more diverse income sources. The trend from defined benefit to defined contribution pension plans shifts a greater share of the responsibility for retirement security to individuals, and makes that security more dependent on choices they make. As a result, a significant subset of the population is unlikely to be able to sustain their standard of living in retirement without higher pre-retirement saving.

Mitchell et. al. (2021) examine respondents in the HRS to observe how their financial situations unfold as they age. They find that real income remains relatively stable as individuals approach and enter retirement, and progress through their retirement years. Moreover, their labor force participation declines and thus earnings became less important with age, while Social Security and retirement savings rise as a proportion of annual income.

Beshears et. al. (2019) explore trends in retirement income adequacy using IRS Tax Data for the years 2000 to 2016 for a 5 percent sample of taxpayers born between 1930 and 1941. The authors first construct a measure of "equivalent" household income that adjusts for the fact that married households need less than twice as much income as single-person households to enjoy the same level of well-being. They find first that the pre-tax household equivalent income of people at age 70 rose across the entire income distribution at about the same rate between 2000 and 2011. Second, at age 80, there is an increase in inequality over time, with pre-tax income rising by 5.0 percent at the median, 8.4 percent at the 75th percentile, and 12.2 percent at the 90th percentile. By contrast, pre-tax income fell by 0.8 percent at the 25th percentile and by 6.6 percent at the 10th percentile. Third, the authors explore households' ability to maintain their pre-retirement living standards by computing the income replacement ratio, defined as equivalent after-tax real income over ages 76 to 79 relative to the same measure over ages 65 to 67. This ratio is flat or rising over time for households with income at or above the median but deteriorates for households below the median.

An alternative approach to measuring retirement adequacy comes from the Center for Retirement Research (2006), which develops what it calls "a new national retirement risk index" (NRRI). The construction of the NRRI involves two steps. The first is to project replacement rates for each household and to determine a target replacement rate. The second step is to compare the projected replacement rates to the targets to determine the NRRI results. The index covers all working-age U.S. households. The original study uses the 2004 SCF. Projected retirement income is based on income from financial assets, including those in defined contribution plans, net of non-mortgage financial debt, housing net of mortgage debt, defined benefit pension plans, and Social Security. The index did not include earnings from work.

Because elderly households generally consume less than working-age households, as the work cited above indicates, a replacement rate of less than 100 percent is used in the calculation of the target replacement rate. However, the report argues that the projected replacement rate

should be higher for low income households in comparison to high income ones because low income households save very little before retirement and enjoy less in the way of tax savings (also see Scholz and Seshadri, 2009, for a similar argument). The report follows this approach. For example, it uses a target replacement rate of 81 percent for couples in the bottom third of the income distribution, 72 percent for couples in the middle third, and 67 percent for couples in the top third. By their calculations, 43 percent of households are “at risk” in 2004 of having inadequate retirement income. In later work, Munnell et. al. (2007) find a sizeable increase in the share of households at risk according to the NRRI from 1983 to 2004. Among the bottom third of the income distribution, the share at risk increases from 47 to 53 percent, while among the top two-thirds the proportion rises from 24 to 38 percent. In their most recent installment, Alicia Munnell et. al. (2021) report almost no change in their index between 2016 and 2019.

It is instructive to compare the methodology used by the Center for Retirement Research (CRR) and that used here in this paper. Both studies use four components to assess retirement security: (i) standard non-pension wealth holdings, including owner-occupied housing (ii) DC pension holdings, (iii) actual or expected DB pension benefits, and (iv) actual or expected Social Security benefits. Both net out mortgage and non-mortgage debt in the calculation of net worth. Both approaches also project retirement income to age 65 by individual component and transform financial assets into a lifetime annuity in the calculation of projected retirement income. One difference in methodology is that in the projection of financial assets to retirement, the CRR projections are based on wealth-to-income patterns by age group, originally based on the 1983-2004 SCF surveys. In contrast, in my approach, I project the value of financial assets on the basis of historical rates of return for these assets. Second, for housing, the CRR projections use the rental value that homeowners receive from living in their home rent free and the amount of equity they could borrow from their housing wealth through a reverse mortgage. In my approach, I project the value of housing on the basis of its historical rate of return. Third, I include two additional components in calculating the projected value of DC wealth: DCEMP or DCEMPW. The former is the projected accumulations in DC plans of future employer contributions, while the latter is the projected accumulations in DC plans of future employee contributions. Fourth, my work provides a decomposition of expected retirement income, poverty, and replacement rate by income source.

All in all, the studies on retirement savings adequacy are relatively inconclusive. Several of these conclude that retirement savings are adequate and expected replacement rates are generally high, whereas others find that expected replacement rates are relatively low and a large number of households near retirement age are at risk of inadequate income at retirement. I treat the subject of retirement adequacy among working-age households below. I look at three indicators of retirement adequacy -- projected retirement income, projected replacement rates, and the projected share of retirees above the poverty line. My results show a very large projected gain in mean retirement income from 1989 to 2019. Expected replacement rates show improvement from 1989 to 2007, though, gains are due more to a reduction in pre-retirement income than to advances in projected income at retirement, followed by almost no change from 2007 to 2019. The share of near retirees at risk of falling below the poverty line at retirement declines from 1989 to 2007 but this is followed by an uptick from 2007 to 2019.

3. Data sources and methods

3.1 Net Worth

The primary data sources used for this study are the 1989, 2001, 2007, and 2019 Survey of Consumer Finances (SCF).¹ I use these data for two reasons. First, the SCF survey was conducted in these years. Second, they are all expansionary years in the business cycle. Each survey consists of a core representative sample combined with a high-income supplement. In later years, the first sample was selected from a standard multi-stage area-probability design. This part of the sample was intended to provide good coverage of asset characteristics such as home ownership that are broadly distributed. The second sample, the high-income supplement, was selected as a so-called “list sample” from statistical records (the Individual Tax File) derived from tax data by the Statistics of Income (SOI) Division of the Internal Revenue Service. In this case, the IRS provides the names and addresses of a sample of very high-income families. This second sample is designed to disproportionately select families that were likely to be relatively wealthy (see, for example, Kennickell, 2001, for a more extended discussion of the design of the list sample in the 2001 SCF). Typically, about two thirds of the cases came from the representative sample and one third from the high-income supplement.

¹ The SCF survey was also conducted in 1983. However, the methodology is somewhat different than the later years and it is missing some key variables that are needed for this study, so that I do not use this data in this study.

The principal wealth concept used here is marketable wealth (or net worth), which is defined as the current value of all marketable or fungible assets less the current value of debts. Net worth is thus the difference in value between total assets and total liabilities. Total assets are defined as the sum of: (1) the gross value of owner-occupied housing; (2) other real estate owned; (3) cash and demand deposits; (4) time and savings deposits, certificates of deposit, and money market accounts; (5) government bonds, corporate bonds, foreign bonds, and other financial securities; (6) the cash surrender value of life insurance plans; (7) the value of defined contribution (DC) pension plans, including IRAs, Keogh, and 401(k) plans; (8) corporate stock and mutual funds; (9) net equity in unincorporated businesses; and (10) equity in trust funds. Total liabilities are the sum of: (1) mortgage debt, (2) consumer debt, including auto loans, and (3) other debt such as educational loans.

This measure reflects wealth as a store of value and therefore a source of potential consumption. I believe that this is the concept that best reflects the level of well-being associated with a family's holdings. Thus, only assets that can be readily converted to cash (that is, "fungible" ones) are included. Though the SCF includes information on the value of vehicles owned by the household, I exclude this from my standard definition of household wealth, since their resale value typically far understates the value of their consumption services to the household. The value of other consumer durables such as televisions, furniture, household appliances, and the like are not included in the SCF.² Another justification for their exclusion is that this treatment is consistent with the national accounts, where purchase of vehicles and other consumer durables is counted as expenditures, not savings.³

Also excluded here is the value of future Social Security benefits the family may receive upon retirement (usually referred to as "Social Security wealth"), as well as the value of retirement benefits from defined benefit pension plans ("DB pension wealth"). Even though these

² On the other hand, the value of antiques, jewelry, art objects and other "valuables" are included in the SCF in the category "other assets."

³ Another rationale is that if vehicles are included in the household portfolio, their "rate of return" would be substantially negative since they depreciate very rapidly over time (see Section 7 for calculations of the overall rate of return on the household portfolio).

funds are a source of future income to families, they are not in their direct control and cannot be marketed.⁴

3.2 Defined Contribution Pension Plans

DC plans include a variety of financial instruments. They are of two types – individually provided plans and employer provided plans. Individually provided plans are IRAs and Keogh plans.⁵ Standard employer provided DC plans are 401(k), 403(b), SRA (Supplemental Retirement Account), and 457 plans. Firms also provide a variety of other plans, such as profit-sharing, tax-deferred annuities, portable cash option plan, IRA-SEP (Simplified Employee Pension) or IRA-SIMPLE (Simplified Incentive Match Plan for Employers), SARSEP (Salary Reduction Simplified Employee Pension), TIAA-CREF (Teachers Insurance and Annuity Association/College Retirement Equity Fund), money purchase plans, deferred compensation plans, cash balance plans, Stock purchase/ESOP (Employee Stock Option Plan), thrift/savings plans, and the like. I have lumped all these together as Defined Contribution plans.

3.3 Defined Benefit Pension Plans

Defined benefit plans include (but are not limited to) state, local, and federal government plans, PERS (public employees retirement system), employer-provided annuity plans, and traditional defined benefit plans. Some employer-provided plans are a mixture of the two. Following the SCF protocol, I have divided DC plans from DB plans on the basis of whether they are “account-type” plans, with a balance or cash value, or whether they are “formula-type” plans, with no cash balance and the benefit determined by such variables as years of service and earnings history.

For retirees, I use their actual reported DB benefit to compute retirement income. Among current workers, the procedure is more complex. The SCF provides detailed information on pension coverage among current workers, including the type of plan, the expected benefit at retirement or the formula used to determine the benefit amount (for example, a fixed percentage of the average of the last five year’s earnings), the expected retirement age when the benefits are

⁴ An alternative data source often used in these studies is the Health and Retirement Survey (HRS). This data source has the advantage over the SCF that it has relatively complete data on earnings histories and has employer-provided information on individual DB pension plans of each employee covered by these plans. However, the SCF has three advantages over the HRS. First, the SCF provides much better data on the assets and liabilities that constitute marketable net worth. Second, the SCF data date from 1983, whereas the HRS data start in 1992. Third, the age coverage of the HRS is limited whereas the SCF covers the whole population.

⁵ This group also includes Roth IRAs and rollovers from pension accounts.

effective, the likely retirement age of the worker, and vesting requirements. Information is provided not only for the current job (or jobs) of each spouse but for up to five past jobs as well. On the basis of the information provided in the SCF and on projected future earnings (see Section 2 of the Appendix for details), future expected pension benefits are then projected to the year of retirement or the first year of eligibility for the pension. It should be noted that the calculation of expected DB benefits for current workers are based on employee response, including his or her stated expected age of retirement (see Section 4 of the Appendix), *not* on employer-provided pension plans.⁶

3.4 Social Security benefits

For current Social Security beneficiaries, I use the Social Security benefit currently being received by the household as reported in the SCF. The imputation of future expected Social Security benefits among current workers is based on the worker's actual and projected earnings history estimated by regression equation (see Section 3 of the Appendix for details). The steps are briefly as follows, First, coverage is assigned based on whether the individual expects to receive Social Security benefits and on whether the individual was salaried or self-employed. Second, on the basis of the person's earnings history, the person's Average Indexed Monthly Earnings (AIME) is computed. Third, on the basis of the rules current at the time of the survey year, the person's Primary Insurance Amount (PIA) is derived from AIME. The worker's expected Social Security benefit is then set equal to his or her PIA.⁷ Here, too, it should be noted

⁶ A couple of studies look at the reliability of employee-provided estimates of pension wealth by comparing self-reported pension benefits with estimates based on provider data. Using data from the 1992 wave of the HRS, Johnson et. al. (2000) find that individual reports of pension benefits tended to differ from those based on provider information. However, they also calculated that the median values of DB plans from the two sources were quite close (about a 6 percent difference). As a result, for *average* values of pension wealth, employee-provided estimates of expected pension wealth seem to be fairly reliable.

It should also be noted that my definition of DB benefits is based on a so-called “on-going concern” treatment. It is assumed in this that employees continue to work at their place of employment until their expected date of retirement (this is also true for Social Security wealth). The alternative is to use the accrual value in which future DB benefits (and future Social Security benefits) are valued as of the current year on the basis of work experience *up to that date only*. I elect the ongoing concern method because it is consistent with my calculations of retirement adequacy. The accrual method will produce lower values of both DB and Social Security benefits. Indeed, the accrual method and the on-going concern treatment represent two extremes in the valuation of both DB and Social Security benefits. The latter treatment, in particular, relies on the assumptions that (1) the firm or organization remains in existence over time and (2) the employee continues working at the enterprise.

⁷ In the case of a married (or co-habiting) couple, the couple's expected Social Security benefit is set equal to the

that estimates of future Social Security benefits are based on reported earnings at a single point in time. These estimates are likely to be inferior to those based on longitudinal work histories of individual workers (see, for example, Smith, Toder, and Iams, 2001, whose estimates are based on actual Social Security work histories.) In fact, actual work histories do show considerably more variance in earnings over time than one based on a human capital earnings function projection. Moreover, they also show many periods of work disruption that I cannot completely capture here. In contrast, I do have *retrospective* information on work history provided by the respondent (see Section 4 of the Appendix for details). In particular, each individual is asked to provide data on the total number of years worked full-time since age 18, the number of years worked part-time since age 18, and the expected age of retirement (both from full-time and part-time work). On the basis of this information, it is possible to approximate the total number of full-time and part-time years worked over the individual's lifetime and use these figures in the estimate of the individual's AIME.⁸

3.5 Employer and employee contributions to defined contribution pension plans

To complete the accounting framework, I lastly consider the contributions made by employers and employees to defined contribution pension plans. So far, I have treated defined contribution plan benefits and defined benefit plan benefits (as well as Social Security benefits) on a comparable footing. However, there is an important difference between DC benefits and the other two in their definition. In particular, I estimate DB benefits as the expected DB pension benefits on the assumption that the employee remains at his or her firm of employment until the person's expected retirement date. The computation of Social Security benefits is also based on the assumption that the worker remains at work until the person's expected retirement date. On the other hand, the valuation of DC pension benefits is based solely on the current market value of DC plans. There is no added value in the calculation of DC benefits from the employee remaining at work (until the expected date of retirement).

What if we put DC benefits on an "equal footing" to DB benefits? To do this, we could add in to DC wealth a projection of the future stream of *employer* and *employee* contributions to

sum of the PIA of each worker or 150 percent of the greater of the two PIAs, whichever is greater.

⁸ Though I can approximate the *number* of years of full-time and part-time work for a given worker, I can not determine when in his or her work history periods of non-employment occurred.

DC accounts like 401(k) plans until the expected year of retirement. Luckily, the SCF does provide information on employer contribution to DC plans (see Section 5 of the Appendix). If we assume, as in the case of DB pensions, that workers remain at their company until retirement and that the terms of their DC contract with their employer stay the same, then it is possible to do this. In most cases, the employer contribution is a fixed percentage of the employee's salary. On the basis of the estimated human capital earnings functions for each worker and the "on-going concern" assumption, it is possible to calculate the annual stream of future employer contributions to the DC plan until retirement (which I call DCEMP).⁹ Adding DCEMP to DCW would then put DC wealth on the same footing as DB wealth, since both would reflect the retirement benefit at time of retirement due to employer contributions to retirement plans.¹⁰

The SCF questionnaire indicates how many DC pension plans each spouse has (up to three per spouse).¹¹ Information on the employer contribution to DC pensions plans is recorded in two ways. First, in some cases, the contribution is given as a flat dollar amount. Though it is not indicated in the survey data whether the dollar contribution is indexed to inflation over time, I assume that it is indexed to the CPI, which seems the more likely arrangement.¹² Let EMPAMT

⁹ As noted in footnote 6 above, I have opted for the "on-going" concern method rather than the accrual method. In the latter method, it is assumed that the worker stops working as of the year of the survey, say 2007. One can then compute the expected DB pension entitlements as of 2007. One can also make such a calculation for social Security benefits. I choose the "on-going concern method because this approach is consistent with my later estimates of retirement adequacy.

¹⁰ I do not provide for a full projection of total wealth accumulation over time. This process would require a household micro-simulation model such as the MINT model that the Urban Institute and the Social Security Administration use (see, for example, Smith, Toder, and Iams, 2001). However, I do provide for a simple projection of non-pension wealth to date of retirement below.

Though with the addition of DCEMP to DC wealth, DC wealth now appears comparable to DB wealth, some differences still remain between the two. In particular, there is greater risk associated with DC wealth. The benefit levels in DB plans are already set by the terms of the plans – that is why these are called *defined benefits*. DB wealth depends only on future labor force participation in the company and future earnings. The establishment of the Pension Benefit Guaranty Corporation in 1974 does, at least, insure the pension benefits (up to a fixed amount) in the event of the bankruptcy of a company. In comparison, DC wealth depends not only on future labor force participation and future earnings but also on future employee contributions, future employer contributions, and future rates of return. DB benefits are more certain than DC benefits. Indeed, the shifting of the risk from employer to employee is one of the reasons behind the rise of DC plans.

¹¹ The SCF records DC plans only for the main job of each respondent. No information on DC plans is provided for secondary employment. This does not appear to be a significant problem because in 2001, 99.4 percent of the total labor earnings of the head and 98.8 percent of that of the spouse came from the person's primary job.

¹² This will, if anything, bias upward the estimated employer contribution to the DC pension plan.

be the dollar amount of the employer contribution to the DC plan. Then, in the case when employer contributions are recorded as a dollar amount, the present value of the stream of future employer contributions, $DCEMP_a$, is given by:

$$(1) \quad DCEMP_a = \int_0^{LR} EMPAMTe^{-\delta^*t} dt$$

where δ^* is the real annual discount rate, set to 2 percent.¹³ The integration runs from the current year to LR, where RA is the expected age of retirement and $LR = A - RA$ is the number of years to retirement.

Second, in most cases, the employer contribution is given as a percent of earnings. If we assume that the proportion, $EMPPER$, is fixed over time, then in the case when the respondent records employer contributions as a percent of earnings, $DCEMP_b$, is given by:

$$(2) \quad DCEMP_b = \int_0^{LR} EMPPER \cdot E^*_t e^{-\delta^*t} dt$$

where E^*_t is the predicted earnings of the worker at time t in constant dollars (see Section 3 of the Appendix for details).

I next include the present discounted value of future *employee* contributions into DC plans, a component which I call $DCEMPW$. The inclusion of this variable is a logical extension of the addition of $DCEMP$. In fact, for the vast majority of firms, the provision of an employer contribution to a DC plan is *contingent* on payments made by an employee into a company-sponsored pension plan.

The computation of $DCEMPW$, like $DCEMP$, is based on data provided in the SCF, which indicates what fraction of the employee's salary is currently contributed into the employee's DC account. As with $DCEMP$, it is assumed that the worker continues to work for the same employer until retirement and that the contribution rate remains unchanged over time. $DCEMPW$ is defined in exactly analogous fashion to $DCEMP$ except that in Equation (1), the term $EMPAMT$ is replaced by $EMPAMTW$, which is the dollar amount of the *employee* contribution to the DC plan, which is assumed to remain fixed in real terms over time; and in Equation (2), the term $EMPPER$ is replaced by $EMPPERW$, which is the *employee* contribution to the DC plan as a percent of earnings, which is assumed to be fixed over time.

¹³ It should be noted that past employer contributions to DC plans are already included in the current market value of DC wealth.

The new accounting framework becomes:

$$(3) \text{ DCEMP} = \text{DCEMP}_a + \text{DCEMP}_b$$

and total DC wealth is now given by:

$$(4) \text{ DCTOT} = \text{DCW} + \text{DCEMP} + \text{DCEMPW}.$$

Moreover, I can now define “non-pension” wealth NWX as marketable household wealth minus DCW:

$$(5) \text{ NWX} = \text{NW} - \text{DCW}$$

where DCW is current defined contribution wealth. Finally, define total pension benefits TPB as:

$$(6) \text{ TPB} = \text{DCTOTB} + \text{DBB}$$

where DCTOTB is total defined contribution plan benefits and DBB is defined benefit plan benefits.

4. Measuring retirement income adequacy

I now turn to a consideration of how well families are prepared for retirement. I first discuss the method for projecting future retirement income. I then show results on three dimensions of retirement income adequacy: (i) projected retirement income; (ii) projected poverty status during retirement; and (iii) the projected income replacement rate at retirement.

4.1 Retirement income projections

Retirement income is based on four components: (i) standard non-pension wealth holdings (NWX), (ii) DC pension holdings, (iii) DB pension entitlements, and (iv) Social Security.¹⁴ Future labor earnings are not included since it is assumed that retirees stop working. All income figures are pre-tax, since the official US poverty rate calculation, which I use below, is based on pre-tax income. Current holdings of non-pension wealth (NWX) are first divided into two parts: equity in owner-occupied housing (HE) and non-home wealth (FWX). There is some disagreement in the literature about whether home equity should be considered part of the resource base for retirement income. On the one hand, home equity provides consumption services directly to the household and, as a result, does not augment other sources of income that

¹⁴ I am ignoring miscellaneous sources of income such as government transfer payments other than Social Security, alimony payments, and the like.

can be used for non-home consumption. On the other hand, home equity can be used to finance current consumption through new mortgages, home equity loans, and even reverse mortgages. In this regard, home equity can also add to the resource base for non-home consumption. Because both views are legitimate, I will compute projected retirement income both including and excluding home equity and, as an intermediate position, including half the value of home equity.

I then convert FSX and HE into an annuity equivalent (ANN) based on the formula:

$$(7) \text{ ANN}_i = r_i \cdot \text{Asset}_i / [1 - (1 + r_i)^{-\max(\text{LERH}, \text{LERW})}]$$

where r_i is the rate of return on Asset i , LERH is the life expectancy of the husband at year of retirement, and LERW is the life expectancy of the wife at year of retirement. Life expectancies are available by gender. In 1989 and 2001, they are available for two racial categories: whites and non-whites. In 2007 and 2019, they are available for three categories: non-Hispanic whites, non-Hispanic Blacks, and Hispanics. I categorize Asian-Americans with whites.¹⁵ In 2019 As discussed in the Appendix, each spouse records his(or her) expected date (or age) of retirement in the SCF. An annuity is calculated for each asset (and debt) based on the historical rate of return on that asset. The asset classes used for the calculation, as well as the corresponding estimated historical rate of return, are listed in Appendix Table 1.

¹⁵ The source for years 2006-2019 is: "National Vital Statistics Reports, Vol. 70, No. 19, March 22, 2022 1900–1928, and United States, 1929–2019": Table 19. Estimated life expectancy at birth, in years, by Hispanic origin and race and sex: Death-registration states, 1900–1928, and United States, 1929–2019, available at: <https://www.cdc.gov/nchs/data/nvsr/nvsr70/nvsr70-19.pdf>. The series with a separate breakdown for Hispanics, non-Hispanic whites, and non-Hispanic females begins only in 2006. The source for 2020 is NVSS Vital Statistics Rapid Release Report No. 15, July 2021, "Provisional Life Expectancy Estimates for 2020" by Elizabeth Arias, Ph.D., Betzaida Tejada-Vera, M.S., Farida Ahmad, M.P.H., and Kenneth D. Kochanek, M.A., available at <https://www.cdc.gov/nchs/data/vsrr/VSRR015-508.pdf> and Supplemental Tables, available at: <https://www.cdc.gov/nchs/data/vsrr/vsrr015-tables-508.pdf>.

The sources for earlier years are as follows: 1989: National Center for Health Statistics, "Vital Statistics of the United States, 1989," Vol. II, Section 6, Life Tables, Washington: Public Health Service, December 1992, DHHS Publication No. [PHS] 93-1104, Page 12, Table 6-3, "Expectation of Life at Single Years of Age, by Race and Sex: United States, 1989," available at:

https://www.cdc.gov/nchs/data/lifetables/life89_2acc.pdf

2001: National Vital Statistics Reports, Volume 52, Number 14, "United States Life Tables, 2001," February 18, 2004, available at:

<file:///C:/Users/ed/Downloads/US20Life20Tables20-20200120-20DHHS.pdf>.

2007: National Vital Statistics Reports, "United States Life Tables, 2007", available at

https://ftp.cdc.gov/pub/health_statistics/nchs/publications/NVSR/59_09/

2019: National Vital Statistics Report, Vol. 70, No. 19, "United States Life Tables, 2019," March 22, 2022, available at:

<https://www.cdc.gov/nchs/data/nvsr/nvsr70/nvsr70-19.pdf>.

The rationale for converting household wealth into an annuity to gauge retirement adequacy is that the annuity value indicates the sustainable level of withdrawals from each asset that will last the (estimated) remainder of the person's life (or, in the case, of a couple, the life of the longest-living spouse) and that will totally exhaust the asset value at time of death.¹⁶ In a sense, this is the wealth equivalent to the concept of permanent income. The rates of return include both capital gains and asset income like dividends and interest, so that the annuity value replaces any projected property income. Though a family need not actually withdraw the annuity value of their wealth each year, the annuity value does indicate the level of *potential* consumption that can be maintained over time from their wealth holdings.

I treat the second component of augmented wealth, defined contribution pension holdings (DCTOT), in exactly the same way, and convert it into an annuity. I treat DCTOT separately from other components of standard wealth since it includes future contributions into DC plans. Somewhat ironically, longer life expectancy translates into a lower yearly annuity for a given amount of wealth. Likewise, the racial retirement income gap may have widened because the life expectancy gap between Blacks and whites narrowed over time.

The third component, defined benefit plan benefits, is the sum of defined benefit pension plan benefits currently received by the husband and wife and pension benefits expected in the future by husband and wife. The former consists of pension benefits received by current retirees as well as benefits currently collected from past jobs by those currently working. Up to six pension from past jobs and six benefits from current jobs benefits can be recorded in the SCF survey (see Section 1 of the Appendix for more details). The latter consists of future expected defined benefit pension benefits as indicated by the respondent.

The fourth component, Social Security benefits, is the sum of Social Security benefits currently being received plus future expected Social Security benefits. The latter is based on a computation of the Primary Insurance Amount (PIA), which, in turn, is based on estimated work history for both husband and wife (see Section 2 of the Appendix for more details).

I then add to current non-pension wealth holdings (NWX) and defined contribution plan holdings the estimated amount of additional wealth accumulations up to the time of retirement. I then estimate the future accumulations of each asset in NWX up to time of retirement. This is

¹⁶ In fact, in principle, the family could convert its net worth into an annuity plan from a life insurance company if the plan was actuarially fair and the life insurance company made no profits on the annuity.

based on the historical real rate of return of each asset type for years 1989-2019 (see Appendix Table 1). I also estimate the future gains on current holdings of defined contribution pension wealth, DCTOT.

It should be noted that I do not try to estimate future savings rates or wealth transfers received from gifts or inheritances. Indeed, it should be stressed that I am *not* attempting to fully model the savings behavior of households nearing retirement, as one can do in a micro-simulation model. As a result, my estimates of retirement income (and replacement rates) should be viewed as lower bounds. However, they are useful for comparing retirement preparedness of an age group at *different points in time*, such as 1989, 2001, 2007, and 2019 to determine whether there is improvement or deterioration.

4.2 Retirement adequacy

I provide calculations for age group 47-64 only for two reasons. First, data on expected DB and Social Security benefits are fairly reliable and inclusive for this age group. Second, this is the soon-to-be-retired age cohort, so that it is of particular interest. The empirical analysis implicitly assumes that each person in the sample survives until age 65.

Retirement adequacy is measured in three different ways. The first is the annual projected retirement income. The second is the percentage of households whose projected retirement income is greater than the poverty threshold.¹⁷ The third is the income replacement rate. This is based on projected retirement income at time of retirement and projected income up to the year of retirement (typically, age 64). For the latter, I use a 1.70 percent annual growth rate of real income, an estimate based on the growth of real income for age group 47 to 64 over the period 1989 to 2019.¹⁸ It should be noted that this is a stringent measure of the replacement rate compared to most of the literature on the subject since it compares (projected) retirement income against (projected) pre-retirement income at the eve of retirement (see Section 2 for a review of

¹⁷ I use the official U.S. poverty thresholds for this analysis and assume that the family's marital status remains unchanged over time and that at time of retirement there are no children living with the parents.

¹⁸ Though it is possible to project wages and salaries at retirement on the basis of the estimated human capital earnings functions (see Section 3 of the Appendix for details), it is not easy to project other forms of income, such as property income, government transfer income other than Social Security benefits, and miscellaneous income. As a result, I use the historical growth in income as the basis for projecting household income at retirement.

the pertinent literature).¹⁹ Other studies use a measure akin to average income over the lifetime (or over 10 to 20 years preceding retirement) or a measure of permanent income as the basis of comparison. However, I think a comparison of expected retirement income to projected income received in the year just before retirement is a more meaningful comparison than of the former to some measure of permanent income because it is the drop in income just after retirement that most affects family well-being. As a result, my estimates of the share of households meeting this replacement rate standard will be lower than in other studies.

4.3 Expected retirement income

Table 1 presents a summary of results on future expected retirement income both overall and by race/ethnicity. In 2019, the latest year available, the mean retirement income for all households in age group 47 to 64 is projected to be a rather substantial \$175,300 in 2019 dollars. This compares to the actual mean income of this group in 2019 of \$134,500. However, there is a big difference between minorities and whites, with Black households projected to have 29.5 percent the income of the latter at retirement and Hispanic households 38.9 percent. In 2019, the ratio of actual mean income was 42.4 percent between Black and white households and 41.9 percent between Hispanics and whites, both higher than that of projected retirement income.

Overall projected median retirement income for this age group is \$56,100. This compares to the actual median income of this group of \$69,000. Again, substantial disparities exist by race/ethnicity, with Black households projected to have 37.4 percent and Hispanic households 45.0 percent that of whites. In comparison, the ratio of actual median income between Blacks and whites was 50.0 percent and that between Hispanics and whites was 52.5 percent, both larger than the corresponding ratio of projected retirement income.

Mean projected retirement income advances very strongly between 1989 and 2001, at an average annual rate of 4.35 percent or 68.5 percent overall. However, changes in retirement income are generally much lower from 2001 to 2007, at an annual rate of 0.96 percent. There is a pick-up in growth over years 2007-2019, at an annual rate of 1.59 percent. Mean retirement income is projected to more than double over the full 1989-2019 period.

¹⁹ Scholz and Seshadri (2009), for example, use two “denominators for their replacement rate calculations: the average of lifetime income up to the time of retirement and income averaged over the top five earnings years. They compute a much lower average replacement rate on the basis of the latter standard: 0.57 versus 0.68. My standard is closer to income averaged over the top five earnings years than to average lifetime income.

Gaps in mean projected retirement income between groups generally widen over time. The ratio of mean retirement income between Black and white households first rises from 0.338 in 1989 to 0.356 in 2007 and then falls off to 0.295 in 2019, for a net reduction over the entire period. A similar pattern exists for the ratio of mean (current) income and mean net worth, which rose between 1989 and 2007 and then fell off from 2007 to 2019. However, unlike retirement income, the ratio in mean income was greater in 2019 than in 1989, while that in mean wealth was about the same in the two years.

The Hispanic/white ratio in mean expected retirement income drops sharply from 0.644 in 1989 to 0.524 in 2001, picks up to 0.582 in 2007, and then declines steeply again to 0.389 in 2019. The ratio of mean income, in contrast, shows a pick-up from 1989 to 2007 and then a fall-off in 2019, for a net gain over the full period, while the ratio of net worth shows the same pattern, falling sharply from 1989 to 2001, recovering in 2007, and then declining steeply again to 2019, for a net decline over the full period.

The story is rather different for median values. Median expected retirement income also grows robustly from 1989 to 2001, at an annual clip of 2.75 percent, slows down to 1.24 percent in 2001-2007, and then turns negative over 2007-2019 at -1.30 percent. Over the full 1989-2019 period, median retirement income gains 28.2 percent, much less than mean retirement income.

As between Black and white households, there is a striking improvement from a ratio of 0.185 in 1989 to 0.508 in 2017 but then a setback to 0.374 in 2019. A similar pattern unfolds for the ratio of median income and median net worth. Nonetheless, median projected retirement income among Black households surges by 186.1 percent from 1989 to 2019. In contrast, there is steady improvement in the ratio of Hispanic/white median retirement income from 0.335 in 1989 to 0.450 in 2019. Median retirement income among Hispanics grows by 90.4 percent over the whole time span. However, the ratio of current income and net worth shows a rise from 1989 to 2007 and then a fall-off in 2019, though both ratios were up over the full 1989-2019 period.

Another dimension is afforded by looking at the inequality of retirement income, as measured by the Gini coefficient. There is an almost steady rise in inequality among all households, from a Gini of 0.595 in 1989 to 0.714 in 2019. A similar pattern unfolds for white households. In contrast, inequality falls among Black households, from a Gini of 0.662 to 0.627, though it rises among Hispanics from 0.571 to 0.627. In 1989, inequality is greatest among Black

households, followed by Hispanics and then whites. However, by 2019, inequality is considerably higher among white households than the two minority groups.

Further details are provided in the next two tables. The first of these, Table 2 shows the percentage composition of expected retirement income. In 2019, 43.9 percent of total retirement income of all households in age group 47 to 64 is projected to come from this group's non-home, non-pension wealth (FWX), including expected gains, and another 9.9 percent from home equity, also including expected capital gains, for a total of 53.8 percent from total non-pension wealth (NWX).²⁰ An additional 27.0 percent is expected from the total value of defined contribution plans (DCTOT), likewise including expected capital gains, and 14.0 percent from expected Social Security benefits, while only 5.1 percent will come from defined benefit pension benefits.

Over time, defined contribution plans are projected to become an increasingly important source of retirement income, rising from 10.2 percent of projected retirement income in 1989 to 27.0 percent in 2019. Correspondingly, defined benefit plans will become less important, dwindling from 20.5 percent of projected retirement income in 1989 to 5.1 percent in 2019. Together, the contribution of total pension wealth to projected retirement income will rise from 30.8 percent in 1989 to 32.2 percent in 2019. The proportion of projected retirement income from non-pension wealth (NWX) will rise over time, from 50.4 percent in 1989 to 53.8 percent, while that from Social Security will fall from 18.8 to 14.0 percent.

There is a big variation in the composition of expected retirement income by race and ethnicity. In 2019, expected Social Security benefits will make up 27.6 percent of the expected retirement income of Black households, compared to 12.4 percent for whites and 13.0 percent for Hispanics, whereas the expected annuity from non-pension wealth NWX will constitute only 26.1 percent for Blacks, compared to 56.4 percent for whites and 55.3 percent for Hispanics. In comparison, there is very little variation in the share of defined contribution pension wealth (DCTOT) across the three groups. DB benefits are projected to account for 12.7 percent of the retirement income of Black families, much higher than that of whites or Hispanics.

Over time, the composition of retirement income is projected to remain fairly stable for the three groups. Exceptions are that for Hispanics, the share of retirement income from NWX is

²⁰ The estimated share of total expected retirement income from net worth is higher than most other estimates because I include the expected annuitized value from net worth in my definition of retirement income rather than expected future property income. As a result, the shares of Social Security and DB pensions in expected retirement income are correspondingly lower than in most other estimates.

projected to rise from 29.2 percent in 1989 to 55.3 percent in 2019, while that from pension wealth is projected to fall from 37.8 to 31.7 percent. Also, the projected proportion of Social Security benefits in expected retirement income falls for whites and particularly Hispanics over 1989-2019, though it remains almost unchanged for Black households.

Table 3 shows levels of retirement income by component. In 2019, the ratio of mean expected retirement income between Black and white households and whites is 29.5 percent and that between Hispanics and whites is 38.9 percent. The ratios of the expected annuity from non-pension wealth FWX are much lower, at 13.6 and 19.1 percent, respectively. The ratio of the expected annuity from defined contribution plans DCTOT is higher for Blacks at 37.2 percent but lower for Hispanics at 28.0 percent. However, the ratios of both expected DB benefits and Social Security benefits are much higher than the overall ratio.

Overall, the expected retirement income of age group 47 to 64 climbs by 68.5 percent between 1989 and 2001, advances by only 5.9 percent from 2001 to 2007, and then recovers somewhat to 21.1 percent in 2007-2019. The expected annuity from FWX among all households grows strongly during the 1990s, by 93.0 percent, but by only 2.0 percent from 2001 to 2007 and by 28.2 percent from 2007 to 2019. The portion from DCTOT shows a huge gain in the first period, tripling in value, a much smaller increase in the second period, 12.5 percent, and then a larger one in the third period, 68.8 percent. Expected DB pension benefits remain largely unchanged in the earlier and middle periods but then plummet by 48.7 percent in the third. Expected Social Security benefits rise sharply in the first period, by over half, and then remain largely unchanged in the second and third periods. As a result, the share of FWX in total retirement income grows from 37.6 percent in 1989 to 43.9 percent in 2019, while the share of Social Security benefits drops from 18.8 to 14.0 percent. However, the share of DCTOT climbs by 16.8 percentage points, from 10.2 to 27.0 percent, while that of DB pensions benefits falls by 15.4 percentage points, from 20.5 to 5.1 percent (see Table 2).

The ratio of mean expected retirement income between Black and white households first jumps from 0.338 in 1989 to 0.356 in 2007 but then retreats to 0.295 in 2019, its lowest point over the full period. The convergence is due largely to the growth in expected Social Security benefits and DCTOT among Black households, which outstrips that among whites. From 1989 to 2007, expected Social Security benefits rise by 103.5 percent among the former and 49.7 percent among whites, while DCTOT increases more than 11-fold for the former and slightly more than

triples for the latter. Social Security benefits account for 32.8 percent of the change in mean expected retirement income for Black households, compared to only 11.6 percent for whites, while DCTOT makes up 37.7 percent and 30.9 percent, respectively (see Table 4).²¹

The expected annuity from NWX grows about the same for Blacks and whites from 1989 to 2007, as do future DB benefits (Table 3). However, the expected NWX annuity accounts for 56.1 percent of the growth in expected retirement income over this period for whites, compared to only 15.7 percent for Black households (Table 4).²²

The share of expected Social Security benefits in expected retirement income also rises among Blacks, from 27.5 percent in 1989 to 30.0 percent in 2007, whereas it falls among whites from 18.1 to 15.2 percent (Table 2). As a result, the ratio of expected Social Security benefits between the two groups climbs from 0.515 in 1989 to 0.700 in 2007 (Table 3). Black families will obtain a much higher share of their retirement income from Social Security than whites – 27.5 versus 15.2 percent in 2007 – and also a much higher proportion from pensions (DC plus DB) – 42.2 versus 31.1 percent -- and a correspondingly much smaller share from standard wealth holdings (NWX) – 27.9 versus 53.7 percent (Table 2).

On net the ratio of the expected annuity from FWX between Blacks and whites grows slightly from 1989 to 2007 while the ratio of the expected annuity from home equity increases substantially over these years (Table 3). As a result, the ratio of retirement income from NWX is up only slightly. However, the ratio in the expected annuity from DCTOT jumps from 0.100 to 0.349. In contrast, the ratio of projected future DB benefits falls marginally.

Why the reversal of fortunes for Black households from 2007 to 2019? The divergence is mainly due to the much faster growth in the expected annuity from NWX among whites (Table 3). This climbs by 37.6 percent, compared to 1.6 percent among Black households. As we saw in Table 1, the ratio of net worth between races also plummeted over these years and the mean wealth of Black households in particular caved by 7.0 percent in real terms. Expected Social Security benefits also grow a bit faster for whites over these years, though gains in the expected annuity from DCTOT are somewhat stronger for Black households. The NWX annuity accounts

²¹ The contribution made by a component such as DCTOT to the overall change in expected retirement income is defined as the change in the mean value of the component divided by the change in the mean value of expected retirement income.

²² The share from DB pensions is trivial for both groups.

for 65.1 percent of the change in mean expected retirement income for whites, compared to only 5.2 percent for Black households, while DCTOT makes up 49.7 percent for the former and 200.2 percent for the latter respectively (see Table 4).²³

The share of expected Social Security benefits in expected retirement income also falls off among Blacks, from 30.0 percent in 2007 to 27.6 percent in 2019, as it does among whites from 15.2 to 12.4 percent (Table 2). On net, the ratio of expected Social Security benefits between the two groups declines from 0.700 to 0.655 (Table 3). However, Black families will still obtain a much higher share of their retirement income from Social Security than whites – 27.6 versus 12.4 percent in 2019 – and also a higher portion from pensions (DC plus DB) – 46.3 versus 31.1 percent -- and a correspondingly much smaller segment from standard wealth holdings (NWX) – 26.1 versus 56.4 percent (Table 2). The ratio of retirement income generated by NWX is likewise down, from 0.185 to 0.136, while the ratio in the annuity from DCTOT is up from 0.349 to 0.372. The ratio of projected future DB benefits also rises, from 0.712 to 0.846.

The story is rather different for Hispanics. The ratio of mean expected retirement income between Hispanic and white households declines from 0.664 in 1989 to 0.582 in 2007 and then falls sharply to 0.389 in 2019, its lowest point over year 1989-2019. The first drop-off is essentially a weighted average effect (Table 3). Indeed, the expected annuity from NWX grows a bit faster for Hispanics from 1989 to 2019 (89.1 versus 84.0 percent), the expected annuity from DCTOT surges four times faster for Hispanics, and future projected Social Security benefits rises modestly more for Hispanics (55.5 versus 49.7 percent). However, the NWX annuity accounts for 56.1 percent of the change in mean expected retirement income for white households, compared to 42.8 percent for Hispanics and DCTOT makes up 30.9 percent for the former versus 24.9 percent for the latter (Table 4). Social security benefits, in contrast, comprise 30.2 percent for Hispanics and only 11.6 percent for whites.²⁴

The share of expected Social Security benefits in expected retirement income declines slightly among Hispanics, from 33.0 percent in 1989 to 31.9 percent in 2007, whereas it falls among whites from 18.1 to 15.2 percent (Table 2). As a result, the ratio of mean expected Social Security benefits between the two groups rises slightly from 1.176 to 1.221 (Table 3). Hispanics

²³ DB pensions make a negative contribution, while Social Security benefits constitute a very small share for both groups.

²⁴ The portion from DB pensions is very small for both groups.

will obtain a much higher portion of their retirement income from Social Security than whites – 31.9 versus 15.2 percent in 2007 – and a somewhat higher proportion from total pensions – 33.7 versus 31.1 percent – and, as a consequence, a much smaller segment from NWX – 34.3 versus 53.7 percent (Table 2). The ratio of the expected annuity from NWX between Hispanics and whites rises slightly from 0.362 to 0.372, 1989 to 2007 while that emanating from DCTOT climbs from 0.111 to 0.314 (Table 3).

As noted, the expected retirement income of Hispanics relative to whites continues to drop through 2019. In fact, the expected retirement income of Hispanics falls in absolute terms, by 12.4 percent, while it gains 31.0 percent among whites. Here, again, the main culprit is income from NWX, which plunges by 29.4 percent for the former but climbs by 37.6 percent for the latter. The change for Hispanics mirrors the trajectory of mean net worth for this group, which plunged by 34.4 percent. Expected Social Security benefits grow about the same for the two groups, though gains in the expected annuity from DCTOT are stronger for white households. The annuity from NWX accounts for 65.1 percent of the (positive) change in mean expected retirement income for whites, whereas it accounts for 70.7 percent of the *decline* for Hispanics (see Table 4). Both income from DCTOT and Social Security benefits increase for Hispanics over these years, thus offsetting part of the decline from the reduction in NWX generated income. In contrast, DCTOT and Social Security make up 49.7 and 3.4 percent, respectively, of the gain in retirement income among whites.

The share of expected Social Security benefits in expected retirement income increases sharply among Hispanics, from 31.9 percent in 2007 to 39.0 percent in 2019 (Table 2). Among whites, there is a moderate reduction from 15.2 to 12.4 percent. On net, the ratio of expected Social Security benefits between the two groups remains unchanged over these years (Table 3). However, Hispanic families like Black families will still obtain a much higher share of their retirement income from Social Security than whites – 39.0 versus 12.4 percent in 2019 – and also a somewhat higher portion from pensions (DC plus DB) – 33.3 versus 31.1 percent -- and a correspondingly much smaller proportion from NWX – 27.7 versus 56.4 percent (Table 2). The ratio of retirement income generated by NWX is likewise down, from 0.372 to 0.191, while the ratio in that from DCTOT also drops from 0.314 to 0.280 (Table 3). In contrast, the ratio of future DB benefits rises from 1.175 to 1.235.

4.5 The expected poverty rate at retirement

Trends in projected poverty rates at retirement tend to follow trends in *median* retirement income (see Panel A of Table 5). In 2019, 9.5 percent of households in age group 47 to 64 are projected to have retirement income less than the poverty line for their family size.²⁵ Only 6.0 percent of white households are projected to fall below the poverty standard, compared to 22.1 percent of Black families and 14.1 percent of Hispanic families. Most of the poverty reduction appears to have taken place between 1989 and 2001, when median retirement income leaped by 39.1 percent. The projected poverty rate at retirement for the whole age group 47 to 64 falls by 6.6 percentage points over these years. From 2001 to 2007 the projected poverty rate falls by only 0.7 percentage points. However, from 2007 to 2019, it actually rises by 2.1 percentage points, as median retirement income declines by 14.4 percent.

Racial/ethnic groups with the highest projected poverty rate in 1989 experience the largest reduction in their projected poverty rate at retirement. The poverty rate for Black families falls by 31.1 percentage points between 1989 and 2001 and that for Hispanics by 23.7 percentage points, while white households see a slight drop-off of 1.3 percentage points. Between 2001 and 2007, Black families undergo another sharp reduction of 11.0 percentage points, while white and Hispanic families witness a slight increase. The gap between minorities and whites declines sharply, from 50.0 percentage points in 1989 to only 8.6 percentage points in 2007 in the case of Black families versus white families and from 33.5 to 13.3 percentage points in the case of Hispanics versus whites.

The pattern generally reverses by 2019. As noted above, the overall projected poverty rate is up to 9.5 percent, a 2.1 percentage point rise from 2007. Among Black families, it jumps by 8.1 percentage points, while white families see a very slight increase and Hispanic families actually experience a 4.7 percentage point reduction. As a result, the racial gap in projected poverty rates widens from 8.6 to 16.0 percentage points while the ethnic differential narrows from 13.3 to 8.0 percentage points.

In Table 6, I show the expected poverty rate at retirement on the basis of current and projected net worth, DCTOT, expected DB benefits, and expected Social Security (SS) benefits. I have added in these components sequentially. Of course, the results depend on the order in

²⁵ It should be noted that the poverty rates reported in Tables 5 and 6 are household poverty rates, not individual (head count) poverty rates. It is assumed that any children living in the household leave home by the time the family retires. The poverty rate is based on a two-person family if the marital status in the survey year is married or co-habiting or a one-person unit if the person is single in the survey year.

which the components are included, so that these results give particular influence to Social Security, the last component.

In 2019, on the basis of current and future gains on FWX, I project a huge poverty rate at retirement of 76.1 percent for households in age group 47 to 64. Since the treatment of housing equity, HE, can be ambiguous (as discussed above), I first include half the expected annuity on HE. This lowers the expected poverty rate by over 9.6 percentage points to 66.6 percent. Adding in the other half from HE lowers it another 11.7 percentage points to 54.9 percent. Thus, standard non-pension wealth holdings alone will bring the expected poverty rate down to a little over half.

Another 17.1 percentage point decline comes from adding in the expected annuity from both the current value and expected future gains on DCTOT to 37.7 percent, and adding in DB benefits reduces the poverty rate a bit more to a little over a third. Finally, adding in the expected Social Security benefit lowers the expected poverty rate by an enormous 24.9 percentage points to 9.5 percent.

There is considerable variation across groups in the importance of these various components to reducing expected poverty. In 2019, Black families in age group 47 to 64 are projected to have a poverty rate of 22.1 percent and Hispanic families a rate of 14.1 percent, compared to 6.0 percent for whites. The poverty rate on the basis of standard wealth, NWX (including home equity) is much lower for whites, 47.4 percent, than Black or Hispanic families, 79.3 and 69.9 percent, respectively. Adding in the expected annuity from DCTOT and DB benefits together lowers the rate for whites by 20.7 percentage points to 26.7 percent, that for blacks by 21.8 percentage points to 57.6 percent, and that for Hispanics by 16.8 percentage points to 53.0 percent. However, adding in Social Security causes an even more sizeable reduction in the expected poverty rate for non-whites -- by 35.5 percentage points to 22.1 percent for Blacks and by 38.9 percentage points to 14.1 percent for Hispanics -- compared to a 20.7 percentage point drop for whites, to 6.0 percent.

I next look at time trends in expected poverty rates. For all households in age group 47 to 64, on the basis of FWX alone, the expected poverty rate declines by 9.3 percentage points from 80.5 percent in 1989 to 71.2 percent in 2007 (see Table 6). With the addition of the full value of HE, the expected poverty rate falls back by somewhat more, 11.5 percentage points, from 60.2 to 48.8 percent. The most important factor explaining the reduction of overall poverty is the growth in defined contribution pension plans. Including DCTOT results in an 18.4 percentage drop in

the poverty rate, from 52.0 to 33.6 percent. However, when DB benefits are added in next, the poverty rate reduction is now considerably less, only 6.2 percentage points, from 33.4 to 27.3 percent. This smaller effect reflects the sharp decline in DB plans over these years. Finally, when Social Security benefits are incorporated, the expected poverty rate declines by 7.4 percentage points from 14.7 to 7.3 percent. This reduction is only a little greater than it is after the incorporation of all other factors.

The pattern reverses from 2007 to 2019. In this case, the expected poverty rate actually increases by 4.9 percentage points from 71.2 percent in 2007 to 76.1 percent in 2019 on the basis of FWX alone. Adding the full value of HE actually causes a larger rise in the poverty rate of 6.1 percentage points. Counting in DCTOT once again causes a reduction in the expected rise in the poverty rate down to 4.1 percentage points. However, this is a much smaller effect than over years 1989 to 2007. As in the earlier period, bringing in DB benefits leads to a greater gain in the poverty rate of 7.1 percentage points. Finally, taking account of Social Security benefits leads to a 2.1 percentage point rise in the poverty rate – 5.0 percentage point lower than it is with all other factors.

The pattern of results is quite similar for white families. However, for them the attrition of DB plans over years 1989 to 2007 raises the poverty rate by 14.0 percentage points (-16.8 – -2.8 percentage points), compared to 12.2 percentage points for all households, while the addition of Social Security benefits actually increases the poverty rate by 2.2 percentage points, compared to a lessening of the poverty rate by 1.2 percentage points for all households. Over years 2007 to 2019, the most notable difference is that the addition of Social Security benefits lowers the poverty rate by 3.2 percentage points, compared to 5.0 percentage points for all households.

There are marked differences in time trends for Black and Hispanic families. Gains in net worth between 1989 and 2007 have a larger effect on reducing the expected poverty rate for Black families than white families -- 15.8 compared to 10.6 percentage points. The growth in the annuity generated by DCTOT also has a more substantial effect for Black families, lowering their expected poverty rate by 29.0 percentage points, compared to 16.8 percentage points for whites. On the other hand, the attrition of DB plans over this period means that the poverty-reducing impact of adding DB benefits to NWX is now lower in 2007 than in 1989 for Black families -- -8.0 versus -14.8 points. Still, the inclusion of DB benefits has a much greater effect

of reducing the poverty rate for Black families than whites over the 1989-2007 period – 22.2 versus 2.8 percentage points.

The effects of Social Security benefits are also more substantial for Black families than whites. Their expected poverty rate on the basis of FWX plus private pensions is 65.4 percent in 1989. Adding in Social Security reduces it by 9.2 percentage points to 56.1 percent. In 2007, their expected poverty rate from the sum of FWX and private pensions is 43.1 percent and adding in Social Security benefits now results in a 29.1 percentage point drop to 14.0 percent. Moreover, the effect is much stronger for Blacks than whites. Adding in Social Security benefits to FWX plus private pensions reduces the expected poverty rate for Blacks by 19.9 percentage points, in comparison to an *increase* of 2.2 percentage points for whites.

Between 2007 and 2019, mean net worth among Black households actually declined in absolute terms. As a result, the reduction in the income generated by NWX raises their expected poverty rate by 9.5 percentage points, compared to a 3.2 percentage point rise for whites. Adding in the income expected from DCTOT raises slightly the poverty rate among Black families, by 1.3 percentage points, reflecting a fall-off in this source of income over the period. Over years 1989 to 2007, in contrast, this addition lowers the poverty rate among Black families by a substantial 13.2 percentage points. Among whites, it reduces the expected poverty rate by 2.4 percentage points over the 2007-2019 period. Next, including expected DB benefits raises the poverty rate among Blacks by a sizeable 3.6 percentage points, once again reflecting the diminution of these plans over these years. This effect is smaller than in the preceding period. It is also comparable to the effect among white families in 2007-2019. Finally, the inclusion of expected Social Security benefits once again reduces the poverty rate among Black families. Over 2007-2019, the decrease is 6.3 percentage points, compared to a much more considerable 19.9 points over the preceding period. However, the effect is larger among Black families than whites over the later period, 3.2 percentage points.

Results for Hispanics differ from those for Blacks. Over years 1989 to 2007, the growth in anticipated income from NWX decreases the Hispanic poverty rate by 12.3 percentage points, somewhat less than for Black families. However, while the inclusion of expected income from DCTOT lowers the Black poverty rate by 13.2 percentage points, it reduces the Hispanic rate by only 5.6 points, reflecting the more widespread ownership of such plans in the Black community. While the devolution of DB plans raises the Black poverty rate by 6.8 percentage points, its more

widespread adoption in the Hispanic community decreases their poverty rate by 2.4 points. Adding Social Security benefits has a huge effect among Black families, reducing their poverty rate by almost 20 percentage points, whereas it has virtually no influence on Hispanic families.

From 2007 to 2019, the slowdown in growth of NWX raises the expected Hispanic poverty rate by 5.0 percentage points, considerably less than the 9.5 percentage point increase among Black families. Adding on the anticipated income from DCTOT reduces the Hispanic rate by a substantial 6.7 percentage points, reflecting the continued spread of DC retirement plans in this community, whereas its cutback increases the Black poverty rate by 1.3 points. The attrition of DB plans, on the other hand, raises both the Hispanic and Black poverty rate to about the same degree. Likewise, increases in Social Security benefits decrease the poverty rate for the two groups to about the same extent (a little over six percentage points).

4.6 Replacement rates

The results on replacement rates are rather different from the two previous sets. The reason is that both expected retirement income and projected pre-retirement income were rising at about the same rate, at least until 2007.²⁶ In 1989, the percentage of all households in age group 47 to 64 with a replacement rate of 75 percent or more is estimated at 40.7 percent (see Panel B of Table 5). The percentage of households meeting this replacement rate standard is only 4.3 percent based on FWX, 8.2 percent from NWX, 10.2 percent when DCTOT is included, but 20.5 percent when DB benefits are added (see Table 7). In fact, DB makes a very large difference of 10.2 percentage points to the percent of household meeting this standard. Social Security has an even bigger effect, with another 20.2 percentage point addition.

Because expected retirement income grows faster than projected income at age 64 between 1989 and 2007, the percentage of households meeting the 75 percent replacement rate standard increases from 40.7 to 51.1 percent. The NWX component makes about the same contribution to the replacement rate in 2007 as in 1989. However, DCTOT makes a larger marginal contribution in the later year, 7.9 compared to 2.0 percentage points – a difference of 5.9 percentage points -- reflecting the widespread growth of these plans. On the other hand, DB benefits and Social Security benefits provide about the same marginal contribution in the two years.

²⁶ It should once again be emphasized the replacement rates computed here are based on the ratio of expected retirement income to *projected income* at age 64.

While projected income at age 64 continues to rise between 2007 and 2019, expected retirement income increases at about the same pace, so that the share of households meeting the 75 percent replacement rate standard remains unchanged. The marginal contributions made by component in 2019 are almost identical to those in 2007 except that that of DCTOT rises from 7.9 to 12.5 percentage points – a gap of 4.5 percentage points -- reflecting the continued expansion of these plans, while that from DB benefits correspondingly falls off from 11.4 to 6.2 points – a disparity of 5.2 points -- reflecting the continued collapse of these plans.

Somewhat surprisingly, the percent of households meeting this replacement rate standard is higher for whites than the two minorities, despite their higher pre-retirement income. As a result, there is a sizeable gap between whites and Black families, 8.2 percentage points in 1989 and 15.0 percentage points in 2007. Most of the gap in 1989 comes from differences in the accumulation of standard non-pension wealth NWX (9.3 percentage points), and a smaller contribution emanates from the larger DCTOT accumulations of whites (2.5 percentage points). This is partially offset by the larger marginal contribution made by DB benefits for Black than white households (6.8 percentage points). Social Security benefits, on the other hand, favor white families (a marginal contribution of 3.2 points).

In 2007, the difference in the accumulation of NWX contributes 5.1 percentage points, less than in 1989. However, the gap in DCTOT makes an even larger marginal contribution in 2007 than in 1989 – 6.1 versus 2.5 percentage points. In contrast to 1989, disparities in DB benefits now favor white families relative to Black families, adding a marginal contribution of 1.2 percentage points. Social Security benefits once again favor white families, adding another 2.6 percentage points to the gap in the share of families attaining this replacement rate standard.

By 2019 the NWX advantage in favor of whites bounces back to 10.2 percentage points, a little greater than in 1989 and reflecting the widening of the racial wealth gap from 2007 to 2019. The marginal contribution of DCTOT to the racial gap in retirement preparedness rises again between 2007 to 2019, from 6.1 to 9.3 percentage points. DB benefits have a neutral effect but the marginal contribution of Social Security benefits now moves slightly in favor of Black families, by 1.5 percentage points.

A somewhat similar pattern exists when comparing white and Hispanic replacement rates, except for 1989. In 1989, the expected annuity from NWX actually slightly favors Latinos over whites (1.1 percentage points). The payout from DCTOT once again favors whites and to

the same degree (2.5 percentage point). DB benefits also help Latinos more than whites but the advantage is now only 1.5 points, instead of 6.8 points as it is for the racial gap. Social Security benefits once again benefit whites more than Latinos but the difference is somewhat smaller, only 2.0 percentage points.

Hispanic-white differences in 2007 are almost identical to racial differences. The NWX advantage in favor of whites is now 5.4 percentage points (as opposed to 5.1 points), the marginal contributions of DCTOT now registers at 5.3 percentage points (compared to 6.1 points), the marginal contribution of DB benefits is 3.9 percentage points in favor of whites (in contrast to 1.2 points), and that in Social Security benefits is 1.7 points in favor of whites (rather than 2.6 points). Latino-white gaps by component are once again similar to racial disparities in 2019. That reflecting differences in income generated by NWX is 7.5 percentage points in favor of whites, compared to 10.2 percentage points for the racial difference. DCTOT adds 10.1 percentage points to the disparity instead of 9.3 points. Differences in DB benefits have no added effect, as is the case for the racial gap. However, differences in Social Security benefits now favor Latinos by 5.8 percentage points, in contrast to only 1.5 percentage points in the case of the Black-white discrepancy.

Similar patterns exist when we look at different cut-off points for replacement rates (Table 8). It is first apparent that raising the replacement rate standard lowers the share of households meeting that standard. Whereas in 2019, 51.6 percent of all households in age range 47 to 64 meet the 75% replacement standard, 94.5 percent meet a 25% replacement standard, 73.4% a 50% standard, but only 35.2 percent a 100% replacement standard.

The share of all households in age group 47 to 64 meeting the indicated replacement rate standard increases from 1989 to 2007 at all replacement levels. Results are mixed from 2007 to 2019. The proportions meeting the 25 and 50 percent replacement rate standards are down a bit, those at the 75 percent level are virtually unchanged, while those at the 100 percent replacement standard rise. The share meeting these standards is uniformly higher for whites than minorities. However, the Black-white gap at the 25 and 50 percent replacement rate standards narrows considerably between 1989 and 2007 but then widens from 2007 to 2019. Over the full period, the disparity falls. In contrast, the racial difference at 75 and 100 percent replacement rates expand almost continuously over time from 1989 to 2019. The Hispanic-white gap at the 25 percent standard falls continuously from 10.9 to 0.9 percentage points from 1989 to 2019. At a

50 percent replacement rate, the disparity first increases from 3.0 points in 1989 to 15.5 points in 2007 but then falls off to 7.9 points in 2019. Similar time trends are in evidence at a 75 percent and 100 percent replacement rate.

5. Summary of results and concluding comments

My findings indicate a marked slowdown in the growth of mean expected retirement income for age group 47 to 64 in the 2000s compared to the 1990s, even before the financial meltdown of 2008-2009. Whereas mean expected retirement income gains 68.5 percent from 1989 to 2001, it advances by only 5.9 percent from 2001 to 2007. Households in this age group also see a large reduction in their expected poverty rate at retirement, from 14.7 percent in 1989 to 8.1 percent in 2001. However, there is only a very small reduction in the expected poverty rate from 2001 to 2007 of 0.7 percentage points. Likewise, the percentage of households with expected retirement income greater than or equal to 75 percent of their projected income at age 64 rises more in the earlier period, from 40.7 to 48.8 than in the later one, from 48.8 to 51.1 percent. Median retirement income also grows much faster in the earlier years, by 39.1 percent, than the subsequent period, by 7.8 percent. Between 2007 and 2019, gains in mean retirement income accelerate to 21.1 percent, while the expected poverty rate actually rises by 2.1 percentage points, the replacement rate remains largely unchanged, and median retirement income shows an absolute decline. Over the full 1989-2019 period, median retirement income gains 28.2 percent, much less than mean retirement income.

Trends in projected poverty rates at retirement tend to follow trends in *median* retirement income. Most of the poverty reduction takes place between 1989 and 2001, when median retirement income leaps by 39.1 percent. The projected poverty rate at retirement for the whole age group 47 to 64 falls by 6.6 percentage points over these years. From 2001 to 2007 the projected poverty rate declines by only 0.7 percentage points. However, from 2007 to 2019, it actually rises by 2.1 percentage points, as median retirement income declines by 14.4 percent.

Changes in the share of households with expected retirement income greater than or equal to three quarters of projected income at retirement are much smaller than changes in the share that fall short of the poverty standard. The reason is that the former is a relative standard whereas the latter is an absolute standard. Changes in the replacement rate reflect changes in both expected retirement income and pre-retirement income itself.

The ratio of mean expected retirement income between Black families and whites first shows a sizeable gain from 0.338 in 1989 to 0.356 in 2007 but then a pronounced retreat to 0.295 in 2019, even lower than in 1989. A similar pattern unfolds for the ratio of median retirement income, though the ratio is higher in 2019 than in 1989. The expected poverty rate among Black families first shows an enormous decline, from 56.1 percent in 1989 to 14.0 percent in 2007 and then a marked reversal to 22.1 percent in 2019. The share meeting the 75 percent replacement rate likewise displays a moderate uptick from 33.7 percent in 1989 to 39.0 percent in 2007 and then a small reversal to 37.8 percent in 2019.

The time pattern is different for Hispanic families. In this case, the ratio of mean retirement income between them and whites exhibits a fairly continuous drop between 1989 and 2019, while the ratio of median retirement income displays a fairly continuous advance. The Hispanic poverty rate shows a fairly continuous decrease from 39.6 percent to 14.1 percent over these years while the proportion meeting the 75 percent replacement standard first falls from 40.0 percent in 1989 to 35.2 percent in 2001 and then sharply increases to 44.0 percent in 2019.

As discussed in Wolff (2022), Black and Hispanic families were hammered by the Great Recession, much more so than white families. Both their mean and median net worth declined in absolute terms between 2007 and 2019. The Great Recession was in many ways the line of demarcation between the substantial headway both groups made from 1989 to 2007 and the reversal of fortunes after 2007.

While Black families see their expected poverty rate drop by 42.2 percentage points between 1989 and 2007 and Latinos by 20.9 percentage points, white households witness only a 0.7 percentage point decline. However, from 2007 to 2019 the white poverty rate is up by only 0.6 percentage points while the Black rate jumps by 8.1 percentage points, though the Hispanic rate is down by 4.7 points. Still, whites have a much lower expected poverty rate in 2019 than minorities -- 6.0 versus 22.1 for Blacks and 14.1 for Hispanics. Moreover, whites experience a greater increase in the share of households with a replacement rate of 75 percent or more from 1989 to 2007 -- 12.1 versus 5.2 percentage points for Blacks and -2.3 points for Hispanics. From 2007 to 2019, the proportion is up 1.8 percentage points for whites, down by 1.2 points for Blacks, and up 6.2 points for Hispanics. Minorities still have a lower share who meet this replacement standard in 2019 despite their lower pre-retirement income -- 37.8 for Blacks and 44.0 percent for Latinos versus 55.8 percent for whites.

Over time, defined contribution plans are projected to become an increasingly important source of retirement income, rising from 10.2 percent of projected retirement income in 1989 to 27.0 percent in 2019. Defined benefit plans, on the other hand, will become less important, dwindling from 20.5 to 5.1 percent. Correspondingly, the proportion of projected retirement income from non-pension wealth (NWX) will rise over time, from 50.4 to 53.8 percent, while that from Social Security will fall from 18.8 to 14.0 percent.

There is a big variation in the composition of expected retirement income by race and ethnicity. In 2019, expected Social Security benefits will make up 27.6 percent of the expected retirement income of Black households, compared to 12.4 percent for whites and 13.0 percent for Hispanics, whereas the expected annuity from non-pension wealth NWX will constitute only 26.1 percent for Blacks, compared to 56.4 percent for whites and 55.3 percent for Hispanics. DB benefits are projected to account for 12.7 percent of the retirement income of Black families, much higher than that of whites or Hispanics.

From 1989 to 2007, Social Security benefits account for 32.8 percent of the change in mean expected retirement income for Black households, compared to only 11.6 percent for whites, while DC accumulations make up 37.7 percent and 30.9 percent, respectively. The expected NWX annuity accounts for 56.1 percent of the growth in expected retirement income over this period for whites, compared to only 15.7 percent for Black households. As a result, the ratio of expected Social Security benefits between the two groups climbs from 0.515 in 1989 to 0.700 in 2007.

Why the reversal of fortunes for Black households from 2007 to 2019? The divergence is mainly due to the much faster growth in the expected annuity from NWX among whites. This climbs by 37.6 percent, compared to 1.6 percent among Black households. The NWX annuity accounts for 65.1 percent of the change in mean expected retirement income for whites, compared to only 5.2 percent for Black households.

The ratio of mean expected retirement income between Hispanic and white households declines from 0.664 in 1989 to 0.582 in 2007 and then falls sharply to 0.389 in 2019. The first drop-off is essentially a weighted average effect. Social Security benefits, in contrast, comprise 30.2 percent for Hispanics and only 11.6 percent for whites of the change in mean retirement income. Hispanics will obtain a much higher portion of their retirement income from Social Security than whites – 31.9 versus 15.2 percent in 2007. For 2007-2019, the main culprit is

income from NWX, which plunges by 29.4 percent for the Hispanics but climbs by 37.6 percent for whites. The share of Social Security benefits in expected retirement income increases sharply among Hispanics, from 31.9 percent in 2007 to 39.0 percent in 2019. Among whites, there is a moderate reduction from 15.2 to 12.4 percent.

Racial/ethnic groups with the highest projected poverty rate in 1989 experience the largest reduction in their projected poverty rate at retirement. The poverty rate for Black families falls by 42.2 percentage points between 1989 and 2007 and that for Hispanics by 20.9 percentage points, while white households see a slight drop off of 0.7 percentage points. The gap between minorities and whites falls sharply, from 50.0 percentage points in 1989 to only 8.6 percentage points in 2007 in the case of Black families versus white families and from 33.5 to 13.3 percentage points in the case of Hispanics versus whites. The pattern generally reverses by 2019. Among Black families, the overall projected poverty rate jumps by 8.1 percentage points, while white families see a very slight increase and Hispanic families actually experience a 4.7 percentage point reduction. As a result, the racial gap in projected poverty rates widens from 8.6 to 16.0 percentage points while the ethnic differential narrows from 13.3 to 8.0 points.

Standard non-pension wealth holdings NWX alone will bring the overall expected poverty rate down to 54.9 percent in 2019. Another 17.1 percentage point decline comes from adding in the expected annuity from DC accumulations to 37.7 percent, and adding in DB benefits brings the poverty rate down a bit more to a little over a third. Finally, adding in the expected Social Security benefit lowers the expected poverty rate by an enormous 24.9 percentage points to 9.5 percent.

There is considerable variation across groups in the importance of these various components to reducing expected poverty. The poverty rate on the basis of NWX is much lower for whites, 47.4 percent, than Black or Hispanic families, 79.3 and 69.9 percent, respectively. Adding in the expected annuity from DCTOT and DB benefits together lowers the rate for whites by 20.7 percentage points to 26.7 percent, that for blacks by 21.8 percentage points to 57.6 percent, and that for Hispanics by 16.8 percentage points to 53.0 percent. However, adding in Social Security causes an even more sizeable reduction in the expected poverty rate for non-whites -- by 35.5 percentage points to 22.1 percent for Blacks and by 38.9 percentage points to 14.1 percent for Hispanics -- compared to a 20.7 percentage point drop for whites, to 6.0 percent.

I next consider time trends in expected poverty rates. For all households in age group 47 to 64, on the basis of NWX alone, the expected poverty rate declines by 11.5 percentage points, from 60.2 to 48.8 percent. Including DCTOT has an even bigger effect, resulting in an 18.4 percentage drop in the poverty rate, from 52.0 to 33.6 percent. When Social Security benefits are incorporated, the expected poverty rate declines by 7.4 percentage points from 14.7 to 7.3 percent. This reduction is only a little greater than it is after the incorporation of all other factors.

The pattern reverses from 2007 to 2019. In this case, the expected poverty rate actually increases by 6.1 percentage points on the basis of NWX alone. Counting in DCTOT once again causes a reduction in the expected rise in the poverty rate down to 4.1 percentage points. Taking account of Social Security benefits leads to a 2.1 percentage point rise in the poverty rate.

There are marked differences in time trends for Black and Hispanic families. Gains in net worth between 1989 and 2007 have a larger effect on reducing the expected poverty rate for Black families than white families -- 15.8 compared to 10.6 percentage points. The growth in DCTOT also has a more substantial effect for Black families, lowering their expected poverty rate by 29.0 percentage points, compared to 16.8 percentage points for whites. The effects of Social Security benefits are also more substantial for Black families than whites. Adding in Social Security benefits to FWX plus private pensions reduces the expected poverty rate for Blacks by 19.9 percentage points, in comparison to an *increase* of 2.2 percentage points for whites.

Between 2007 and 2019, mean net worth among Black households actually declined in absolute terms. As a result, the reduction in the income generated by NWX raises their expected poverty rate by 9.5 percentage points, compared to a 3.2 percentage point rise for whites. The inclusion of expected Social Security benefits once again reduces the poverty rate among Black families. Over 2007-2019, the decrease is 6.3 percentage points, compared to a much more considerable 19.9 points over the preceding period. However, the effect is larger among Black families than whites over the later period, 3.2 percentage points.

Results for Hispanics differ from those for Blacks. Over years 1989 to 2007, the growth in anticipated income from NWX decreases the Hispanic poverty rate by 12.3 percentage points, somewhat less than for Black families. Adding Social Security benefits has a huge effect among Black families, reducing their poverty rate by almost 20 percentage points, whereas it has virtually no influence on Hispanic families. From 2007 to 2019, the slowdown in growth of

NWX raises the expected Hispanic poverty rate by 5.0 percentage points, considerably less than the 9.5 percentage point increase among Black families. Increases in Social Security benefits decreases the poverty rate for the two groups to about the same extent (a little over six percentage points).

In 1989, the percentage of all households in age group 47 to 64 with a replacement rate of 75 percent or more is estimated at 40.7 percent. The percentage of households meeting this replacement rate standard is only 8.2 percent from NWX, 10.2 percent when DCTOT is included, but 40.7 percent when DB and Social Security benefits are added.

Because expected retirement income grows faster than projected income at age 64 between 1989 and 2007, the percentage of households meeting the 75 percent replacement rate standard increases from 40.7 to 51.1 percent. The NWX component makes about the same contribution to the replacement rate in 2007 as in 1989. However, DCTOT makes a larger marginal contribution in the later year, 7.9 compared to 2.0 percentage points. While projected income at age 64 continues to rise between 2007 and 2019, expected retirement income increases at about the same pace, so that the share of households meeting the 75 percent replacement rate standard remains unchanged. The marginal contributions made by component in 2019 are almost identical to those in 2007 except that that of DCTOT rises from 7.9 to 12.5 percentage points.

The percentage of households meeting the 75 percent replacement rate standard is higher for whites than the two minorities, despite their higher pre-retirement income. As a result, there is a sizeable gap between whites and Black families, 8.2 percentage points in 1989 and 15.0 percentage points in 2007. Most of the gap in 1989 comes from differences in the accumulation of standard non-pension wealth NWX (9.3 percentage points).

In 2007, the difference in the accumulation of NWX contributes 5.1 percentage points, less than in 1989. However, the gap in DCTOT makes an even larger marginal contribution in 2007 than in 1989 – 6.1 versus 2.5 percentage points. By 2019 the NWX advantage in favor of whites bounces back to 10.2 percentage points, a little greater than in 1989 and reflecting the widening of the racial wealth gap from 2007 to 2019. The marginal contribution of DCTOT to the racial gap in retirement preparedness rises again between 2007 to 2019, from 6.1 to 9.3 percentage points. Hispanic-white differences in both 2007 and 2019 are almost identical to racial differences.

Social Security is a much more important as a source of expected retirement income among the minorities than among whites. It has thus served as an important equalizing factor in retirement adequacy.

The racial convergence in mean retirement income over 1989-2007 is due largely to the growth in expected Social Security benefits among minorities, which outstrip that among whites. Moreover, the importance of Social Security benefits in expected retirement income grows over time between 1989 and 2007 for the two minority groups. The faster growth of expected Social Security benefits among minorities largely explains the decline in the gap in expected retirement income between them and whites from 1989 to 2007. Social Security also causes a massive reduction in the expected poverty rate for non-whites -- about 30 percentage points for Blacks and Hispanics in 2007 and between 36 and 39 percentage points in 2019.

In summary, Social Security has been much more important as a source of expected retirement income among minorities than among whites. It has thus served as an important equalizing factor in retirement adequacy. Moreover, the importance of Social Security benefits in expected retirement income grows over time between 1989 and 2019 for the two minority groups.

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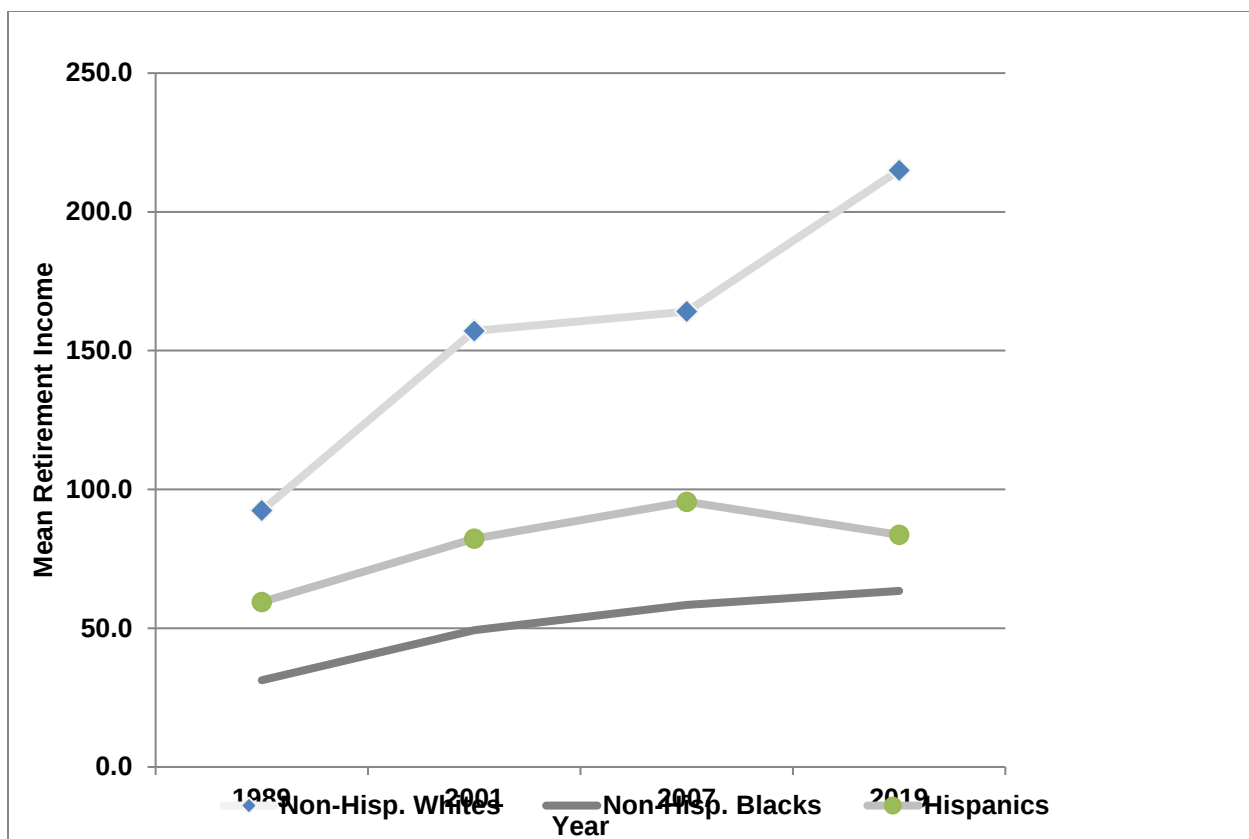


Figure 1. Mean retirement income (in 1000s, 2019 dollars)

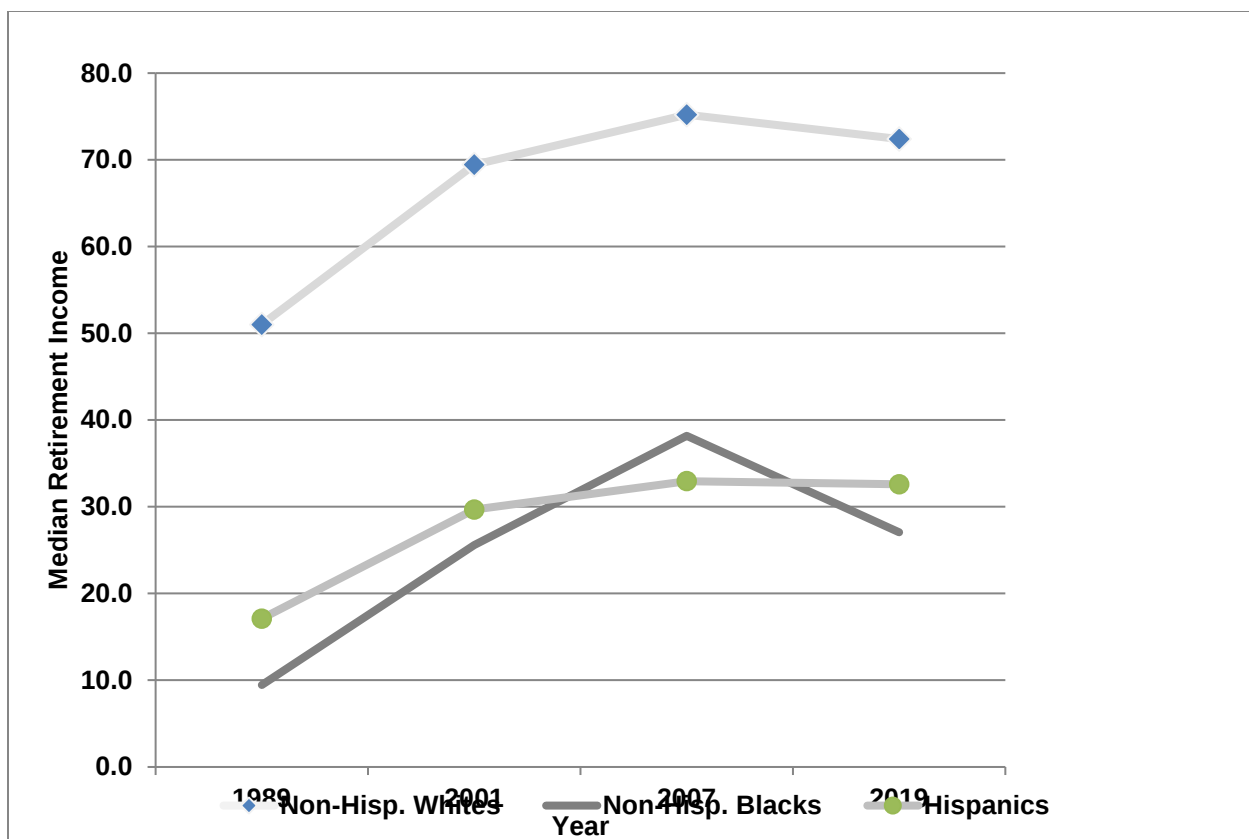


Figure 2. Median retirement income (in 1000s, 2019 dollars)

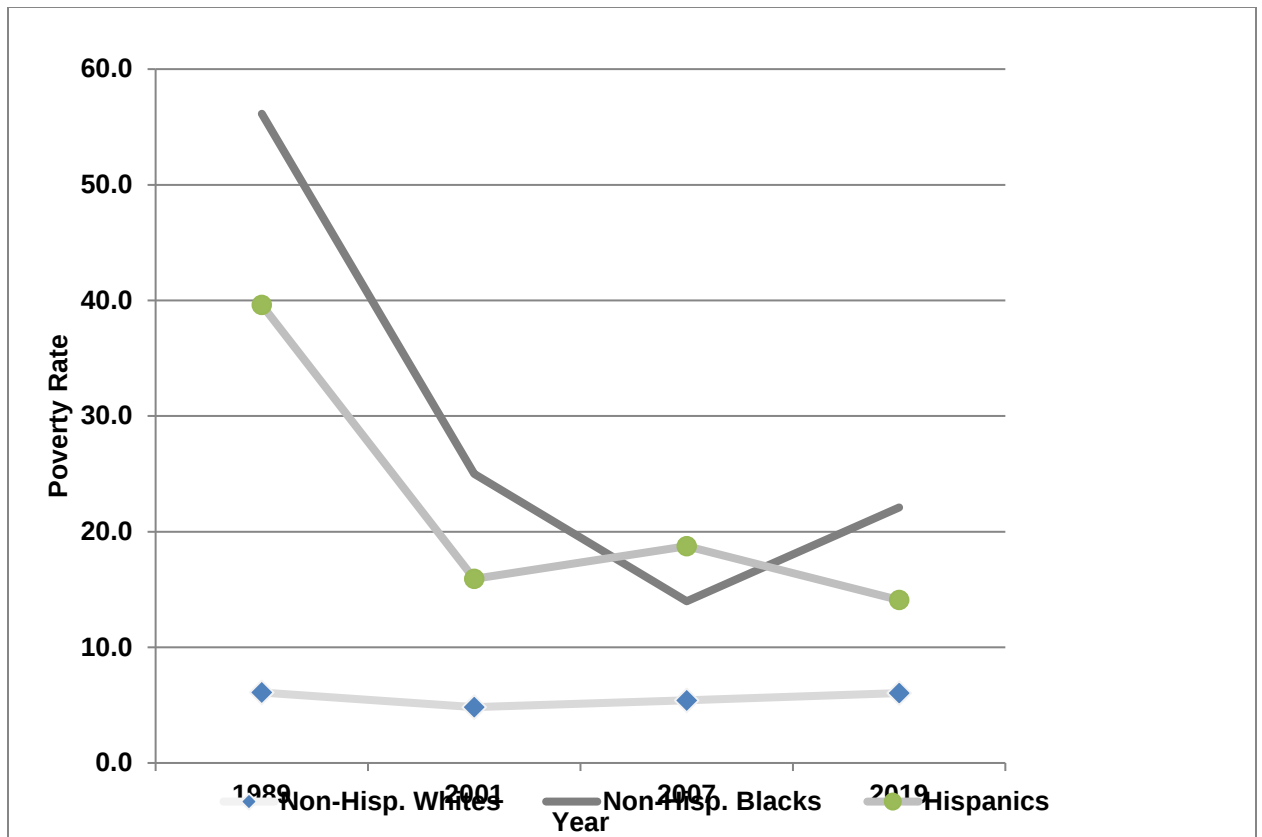


Figure 3. Percentage of Households with Expected Retirement Income Less Than the Poverty Line

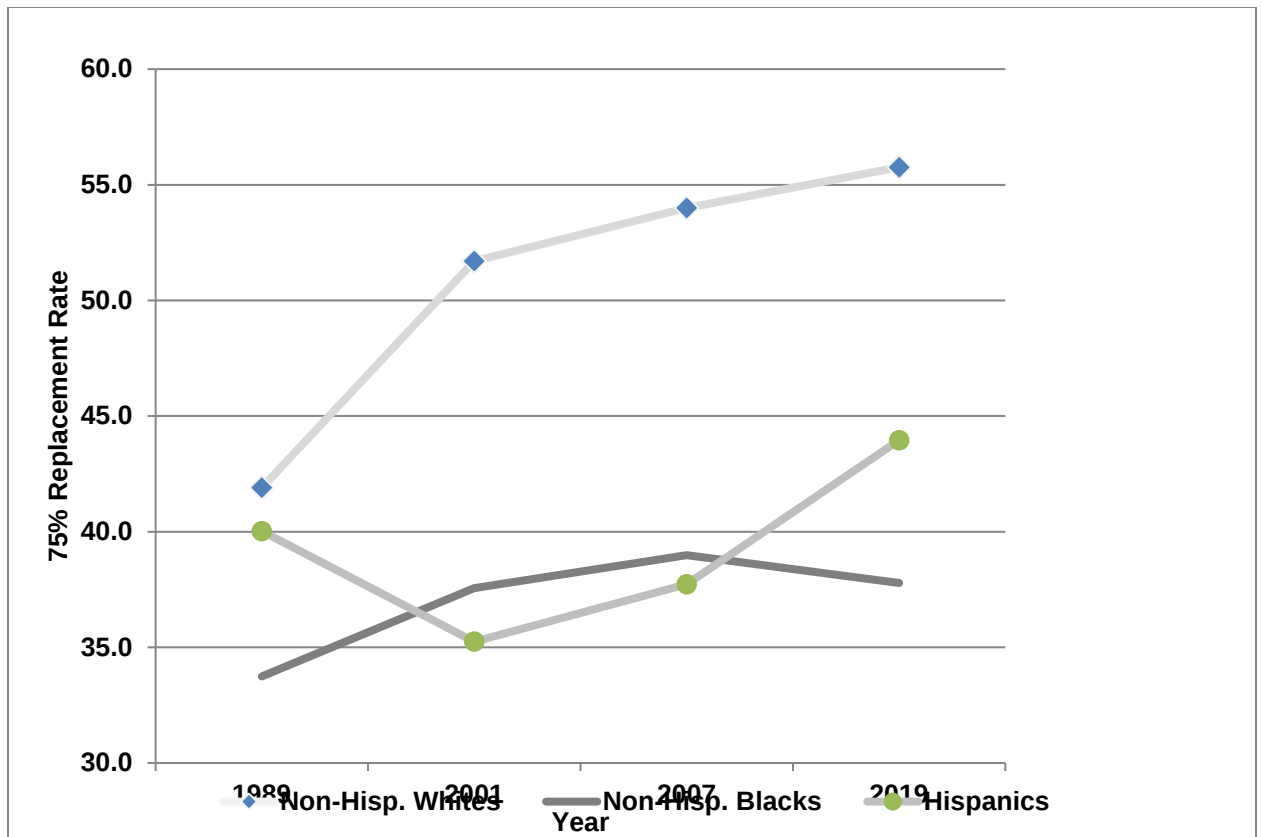


Figure 4. Percentage of Households Meeting 75% Replacement Rate

Table 1. Summary Table: Expected Mean Retirement Income Based on Wealth and Expected Pension and Social Security Benefits, 1989-2019

(In thousands, 2019 dollars)

					Annual percentage rate of growth			
	1989	2001	2007	2019	1989-2001	2001-2007	2007-2019	1989-2019
<u>A. Mean retirement income</u>								
1. All Households, Ages 47-64	81.2	136.7	144.8	175.3	4.35	0.96	1.59	2.57
2. Non-Hispanic white	92.4	157.1	164.1	215.0	4.43	0.72	2.25	2.82
3. Non-Hispanic Black	31.2	49.3	58.4	63.4	3.80	2.82	0.69	2.36
4. Hispanic	59.4	82.3	95.6	83.7	2.71	2.49	-1.11	1.14
<u>B. Ratio of mean retirement income</u>								
1. Black / white households	0.338	0.314	0.356	0.295				
2. Hispanic / white households	0.644	0.524	0.582	0.389				
<u>C. Median retirement income</u>								
1. All Households, Ages 47-64	43.7	60.8	65.5	56.1	2.75	1.24	-1.30	0.83
2. Non-Hispanic white	51.0	69.4	75.2	72.4	2.57	1.33	-0.32	1.17
3. Non-Hispanic Black	9.5	25.6	38.2	27.0	8.30	6.67	-2.87	3.50
4. Hispanic	17.1	29.7	32.9	32.6	4.59	1.74	-0.09	2.15
<u>D. Ratio of median retirement income</u>								
1. Black / white households	0.185	0.368	0.508	0.374				
2. Hispanic / white households	0.335	0.427	0.438	0.450				
<u>E. Gini coefficient, households 47-64</u>								
1. All Households, Ages 47-64	0.595	0.647	0.643	0.714				
2. Non-Hispanic white	0.569	0.638	0.638	0.705				
3. Non-Hispanic Black	0.662	0.565	0.499	0.627				
4. Hispanic	0.571	0.533	0.621	0.627				
<u>Memo:</u>								
<u>F. Ratio of actual mean income</u>								
1. Black / white households	0.361	0.400	0.462	0.424				
2. Hispanic / white households	0.403	0.483	0.498	0.419				

<u>G. Ratio of mean net worth</u>				
1. Black / white households	0.165	0.164	0.202	0.166
2. Hispanic / white households	0.418	0.218	0.413	0.240
<u>H. Ratio of actual median income</u>				
1. Black / white households	0.364	0.544	0.656	0.500
2. Hispanic / white households	0.485	0.579	0.656	0.525
<u>I. Ratio of median net worth</u>				
1. Black / white households	0.156	0.166	0.252	0.132
2. Hispanic / white households	0.237	0.228	0.292	0.285
Source: author's computations from the 1989, 2001, 2007, and 2019 SCF, ages 47-64 only. Total retirement income includes expected future gains on all components of net worth NW. Households are classified by the age of the head of household. Asian and other races are excluded from the table because of small sample sizes.				

Table 2. Percentage Composition of Expected Mean Retirement Income Based on Wealth Holdings and Expected Pension and Social Security Benefits, 1989-2019

	Non-Home Non-Pension Wealth (FWX)	Home Equity (HE)	DC Plans (DCTOT)	DB Pensions	Social Security	Total
<u>I. 1989</u>						
1. All Households, Ages 47-64	37.6	12.9	10.2	20.5	18.8	100.0
2. Non-Hispanic white	39.3	12.5	10.8	19.3	18.1	100.0
3. Non-Hispanic Black	12.9	14.8	3.2	41.6	27.5	100.0
4. Hispanic	15.4	13.8	1.9	35.9	33.0	100.0
<u>II. 2001</u>						
1. All Households, Ages 47-64	43.0	8.8	18.3	12.8	17.1	100.0
2. Non-Hispanic white	44.8	8.7	18.4	12.1	16.1	100.0
3. Non-Hispanic Black	18.5	8.5	15.8	28.1	29.1	100.0
4. Hispanic	16.2	7.7	12.4	26.2	37.5	100.0
<u>III. 2007</u>						
1. All Households, Ages 47-64	41.5	10.7	19.4	12.1	16.3	100.0
2. Non-Hispanic white	43.3	10.4	19.6	11.5	15.2	100.0
3. Non-Hispanic Black	14.2	13.6	19.2	23.0	30.0	100.0
4. Hispanic	22.8	11.6	10.6	23.2	31.9	100.0
<u>III. 2019</u>						
1. All Households, Ages 47-64	43.9	9.9	27.0	5.1	14.0	100.0
2. Non-Hispanic white	46.7	9.7	26.7	4.4	12.4	100.0
3. Non-Hispanic Black	15.7	10.3	33.6	12.7	27.6	100.0
4. Hispanic	15.9	11.7	19.3	14.1	39.0	100.0

Source: author's computations from the 1989, 2001, 2007, and 2019 SCF, ages 47-64 only.

Households are classified by the age of the head of household.

Each column equals the expected annuity (or annual benefit) from the current holdings of the indicated asset plus any future expected gains on the asset. Key:

(1) HE: Net equity in owner-occupied housing

(2) FWX: Non-home, non-pension wealth = NW - DC - HE

(3) DCTOT: Total DC wealth = DC + DCEMP + DCEMPW

Asian and other races are excluded from the table because of small sample sizes.

Table 3. Expected Mean Retirement Income Based on Wealth Holdings and Expected Pension and Social Security Benefits by Component, 1989-2019

(In thousands, 2019 dollars)

	Non-Home Non-Pension Wealth (FWX)	Home Equity (HE)	DC Plans (DCTOT)	DB Pensions	Social Security	Total
<u>A. Mean Values</u>						
<u>I. 1989</u>						
1. All Households, Ages 47-64	30.5	10.5	8.3	16.6	15.3	81.2
2. Non-Hispanic white	36.3	11.6	10.0	17.8	16.7	92.4
3. Non-Hispanic Black	4.0	4.6	1.0	13.0	8.6	31.2
4. Hispanic	9.1	8.2	1.1	21.4	19.6	59.4
<u>II. 2001</u>						
1. All Households, Ages 47-64	58.9	12.0	25.0	17.5	23.4	136.7
2. Non-Hispanic white	70.3	13.7	28.8	19.0	25.3	157.1
3. Non-Hispanic Black	9.1	4.2	7.8	13.8	14.4	49.3
4. Hispanic	13.3	6.3	10.2	21.6	30.9	82.3
<u>III. 2007</u>						
1. All Households, Ages 47-64	60.0	15.5	28.1	17.5	23.6	144.8
2. Non-Hispanic white	71.1	17.1	32.1	18.8	25.0	164.1
3. Non-Hispanic Black	8.3	8.0	11.2	13.4	17.5	58.4
4. Hispanic	21.7	11.1	10.1	22.1	30.5	95.6
<u>III. 2019</u>						
1. All Households, Ages 47-64	77.0	17.4	47.4	9.0	24.5	175.3
2. Non-Hispanic white	100.4	20.9	57.4	9.5	26.7	215.0
3. Non-Hispanic Black	10.0	6.5	21.3	8.1	17.5	63.4
4. Hispanic	13.3	9.8	16.1	11.8	32.6	83.7
<u>B. Ratios in Mean Retirement Income</u>						
<u>I. 1989</u>						
1. Black / white households	0.111	0.399	0.100	0.731	0.515	0.338
2. Hispanic / white households	0.252	0.708	0.111	1.201	1.176	0.644

II. 2001						
1. Black / white households	0.130	0.307	0.271	0.727	0.568	0.314
2. Hispanic / white households	0.190	0.463	0.353	1.134	1.222	0.524
III. 2007						
1. Black / white households	0.117	0.467	0.349	0.712	0.700	0.356
2. Hispanic / white households	0.306	0.648	0.314	1.175	1.221	0.582
III. 2019						
1. Black households / white households	0.099	0.314	0.372	0.846	0.655	0.295
2. Hispanic / white households	0.133	0.471	0.280	1.235	1.221	0.389
C. Percentage Change over Time						
I. 1989-2007						
1. All Households, Ages 47-64	96.9	48.8	237.8	5.2	54.9	78.4
2. Non-Hispanic white	95.7	47.3	221.3	5.9	49.7	77.7
3. Non-Hispanic Black	105.8	72.2	1,025.4	3.1	103.5	86.8
4. Hispanic	137.8	34.9	811.8	3.6	55.5	60.8
III. 2007-2019						
1. All Households, Ages 47-64	28.2	12.0	68.8	-48.7	3.7	21.1
2. Non-Hispanic white	41.3	22.1	78.7	-49.4	7.0	31.0
3. Non-Hispanic Black	20.3	-17.9	90.3	-39.9	0.1	8.7
4. Hispanic	-38.6	-11.2	59.5	-46.8	6.9	-12.4
IV. 1989-2019						
1. All Households, Ages 47-64	152.4	66.6	470.2	-46.0	60.6	116.0
2. Non-Hispanic white	176.6	79.9	474.3	-46.4	60.2	132.8
3. Non-Hispanic Black	147.6	41.5	2,042.1	-38.0	103.7	103.0
4. Hispanic	45.9	19.8	1,354.4	-44.9	66.3	40.8
Source: author's computations from the 1989, 2001, 2007, and 2019 SCF, ages 47-64 only.						
Households are classified by the age of the head of household.						
Each column equals the expected annuity (or annual benefit) from the current holdings of the indicated asset plus any future expected gains on the asset. Also see notes to Table 2.						

**Table 4. Percentage Contribution to the Change in Expected Mean Retirement Income
By Component, 1989 - 2019**

	Non-Home Non-Pension Wealth (FWX)	Home Equity (HE)	DC Plans (DCTOT)	DB Pensions	Social Security	Total
<u>I. 1989-2007</u>						
1. All Households, Ages 47-64	46.4	8.0	31.1	1.4	13.2	100.0
2. Non-Hispanic white	48.5	7.7	30.9	1.5	11.6	100.0
3. Non-Hispanic Black	15.7	12.3	37.7	1.5	32.8	100.0
4. Hispanic	34.9	7.9	24.9	2.1	30.2	100.0
<u>III. 2007-2019</u>						
1. All Households, Ages 47-64	55.6	6.1	63.4	-28.0	2.9	100.0
2. Non-Hispanic white	57.7	7.4	49.7	-18.3	3.4	100.0
3. Non-Hispanic Black	33.3	-28.1	200.2	-105.6	0.2	100.0
4. Hispanic ^a	70.7	10.4	-50.6	87.2	-17.7	100.0
<u>IV. 1989-2019</u>						
1. All Households, Ages 47-64	49.4	7.4	41.5	-8.1	9.8	100.0
2. Non-Hispanic white	52.3	7.6	38.7	-6.7	8.2	100.0
3. Non-Hispanic Black	18.5	6.0	63.2	-15.3	27.7	100.0
4. Hispanic	17.3	6.7	61.9	-39.6	53.7	100.0

Source: author's computations from the 1989, 2001, 2007, and 2019 SCF.

Households are classified by the age of the head of household.

Each column equals the expected annuity (or annual benefit) from the current holdings of the indicated asset plus any future expected gains on the asset.

The contribution made by a component such as pension wealth to the overall change in expected retirement income is defined as the change in the mean value of the component divided by the change in the mean value of expected retirement income. Also see notes to Table 2.

a. The change in retirement income is negative for Hispanics over years 2007 to 2019.

**Table 5. Summary Table: Expected Poverty Rates and Replacement Rates
Based on Wealth Holdings and Expected Pension and Social Security Benefits, 1989-2019
(In percentage points)**

	1989	2001	2007	2019	1989-2001	2001-2007	2007-2019	1989-2019
<u>A. Percent of Households with Expected Retirement Income Less Than the Poverty Line</u>								
1. All Households, Ages 47-64	14.7	8.1	7.3	9.5	-6.6	-0.7	2.1	-5.2
2. Non-Hispanic white	6.1	4.8	5.4	6.0	-1.3	0.6	0.6	0.0
3. Non-Hispanic Black	56.1	25.0	14.0	22.1	-31.1	-11.0	8.1	-34.0
4. Hispanic	39.6	15.9	18.8	14.1	-23.7	2.8	-4.7	-25.5
<u>B. Percent of Households with Expected Retirement Income Greater Than or Equal to 75 Percent of Projected Income at Age 64</u>								
1. All Households, Ages 47-64	40.7	48.8	51.1	51.6	8.2	2.2	0.6	11.0
2. Non-Hispanic white	41.9	51.7	54.0	55.8	9.8	2.3	1.8	13.9
3. Non-Hispanic Black	33.7	37.6	39.0	37.8	3.8	1.4	-1.2	4.0
4. Hispanic	40.0	35.2	37.7	44.0	-4.8	2.5	6.2	3.9
Source: author's computations from the 1989, 2001, 2007, and 2019 SCF.								
Total retirement income includes expected future gains on all components of net worth NW.								
Households are classified by the age of the head of household.								
Asian and other races are excluded from the table because of small sample sizes.								

Table 6. Percentage of Households with Expected Retirement Income Less Than the Poverty Line, Based On Wealth Holdings and Expected Pension and Social Security Benefits, 1989-2019
(In percentage points)

	Non-Home Non-Pension Wealth (FWX)	FWX plus Half of Home Equity (HE)	Non-Pension Wealth (NWX)	NWX Plus DC Plans (DCTOT)	NWX Plus All Pensions (PW)	Total Expected Retirement Income: NWX + PW + Social Security
<u>A. Poverty Rates</u>						
<u>I. 1989</u>						
1. All Households, Ages 47-64	80.5	73.7	60.2	52.0	33.4	14.7
2. Non-Hispanic white	77.1	70.0	54.9	45.7	25.7	6.1
3. Non-Hispanic Black	97.7	92.5	85.6	80.1	65.4	56.1
4. Hispanic	86.9	82.2	77.2	77.2	71.9	39.6
<u>II. 2001</u>						
1. All Households, Ages 47-64	70.3	62.9	53.1	38.6	29.5	8.1
2. Non-Hispanic white	66.6	58.4	48.4	33.1	24.1	4.8
3. Non-Hispanic Black	83.7	81.7	75.8	64.1	53.2	25.0
4. Hispanic	89.4	82.1	67.9	57.0	50.6	15.9
<u>III. 2007</u>						
1. All Households, Ages 47-64	71.2	61.6	48.8	33.6	27.3	7.3
2. Non-Hispanic white	67.2	56.8	44.2	28.9	22.9	5.4
3. Non-Hispanic Black	89.7	82.0	69.8	51.1	43.1	14.0
4. Hispanic	85.9	81.8	64.9	59.3	51.6	18.8
<u>III. 2019</u>						
1. All Households, Ages 47-64	76.1	66.6	54.9	37.7	34.4	9.5
2. Non-Hispanic white	71.3	60.3	47.4	29.7	26.7	6.0
3. Non-Hispanic Black	90.6	85.1	79.3	62.0	57.6	22.1
4. Hispanic	88.5	82.4	69.9	57.6	53.0	14.1
<u>B. Racial/Ethnic Differences in Poverty Rates</u>						
<u>I. 1989</u>						
1. Black Minus white households	20.6	22.5	30.8	34.4	39.6	50.0
2. Hispanic Minus white households	9.7	12.2	22.3	31.5	46.1	33.5
<u>II. 2001</u>						

1. Black Minus white households	17.1	23.3	27.4	31.0	29.1	20.2
2. Hispanic Minus white households	22.7	23.6	19.5	23.8	26.5	11.1
<u>III. 2007</u>						
1. Black Minus white households	22.6	25.2	25.6	22.2	20.2	8.6
2. Hispanic Minus white households	18.8	25.0	20.7	30.4	28.8	13.3
<u>III. 2019</u>						
1. Black Minus white households	19.3	24.8	31.9	32.3	30.9	16.0
2. Hispanic Minus white households	17.3	22.1	22.4	28.0	26.3	8.0
<u>C. Time Trends: Percentage Point Differences</u>						
<u>I. 2007 Minus 1989</u>						
1. All Households, Ages 47-64	-9.3	-12.2	-11.5	-18.4	-6.2	-7.4
2. Non-Hispanic white	-10.0	-13.2	-10.6	-16.8	-2.8	-0.7
3. Non-Hispanic Black	-8.0	-10.5	-15.8	-29.0	-22.2	-42.2
4. Hispanic	-0.9	-0.4	-12.3	-17.9	-20.2	-20.9
<u>III. 2019 Minus 2007</u>						
1. All Households, Ages 47-64	4.9	5.0	6.1	4.1	7.1	2.1
2. Non-Hispanic white	4.1	3.5	3.2	0.7	3.8	0.6
3. Non-Hispanic Black	0.8	3.1	9.5	10.9	14.4	8.1
4. Hispanic	2.6	0.6	5.0	-1.7	1.4	-4.7
<u>III. 2019 Minus 1989</u>						
1. All Households, Ages 47-64	-4.3	-7.2	-5.4	-14.3	0.9	-5.2
2. Non-Hispanic white	-5.9	-9.7	-7.4	-16.1	1.0	0.0
3. Non-Hispanic Black	-7.2	-7.4	-6.3	-18.1	-7.8	-34.0
4. Hispanic	1.7	0.2	-7.3	-19.6	-18.8	-25.5
Source: author's computations from the 1989, 2001, 2007, and 2019 SCF.						
Total retirement income includes expected future gains on all components of net worth NW.						
Households are classified by the age of the head of household. Also see notes to Table 2.						

Table 7. Percentage of Households with Expected Retirement Income Greater Than or Equal to 75 Percent of Projected Income at Age 64, Based on Wealth Holdings And Expected Pension and Social Security Benefits, 1989-2019
(In percentage)

	Non-Home Non-Pension Wealth (FWX)	FWX plus Half of Home Equity (HE)	Non-Pension Wealth (NWX)	NWX Plus DC Plans (DCTOT)	NWX Plus All Pensions (PW)	Total Expected Retirement Income: NWX + PW + Social Security
<u>I. 1989</u>						
1. All Households, Ages 47-64	4.3	5.5	8.2	10.2	20.5	40.7
2. Non-Hispanic white	5.1	6.5	9.4	12.0	21.2	41.9
3. Non-Hispanic Black	0.1	0.1	0.1	0.1	16.2	33.7
4. Hispanic	3.1	3.1	10.6	10.6	21.3	40.0
<u>II. 2001</u>						
1. All Households, Ages 47-64	7.8	9.3	11.3	18.7	28.7	48.8
2. Non-Hispanic white	9.1	10.9	13.3	21.9	32.1	51.7
3. Non-Hispanic Black	2.2	2.2	2.5	5.7	16.2	37.6
4. Hispanic	2.1	2.5	3.0	4.5	12.0	35.2
<u>III. 2007</u>						
1. All Households, Ages 47-64	6.7	7.8	10.6	18.5	29.9	51.1
2. Non-Hispanic white	7.3	8.6	11.6	20.6	32.4	54.0
3. Non-Hispanic Black	3.5	3.8	6.5	9.4	20.0	39.0
4. Hispanic	5.7	6.0	6.2	9.9	17.9	37.7
<u>IV. 2019</u>						
1. All Households, Ages 47-64	7.6	9.1	11.5	24.0	30.2	51.6
2. Non-Hispanic white	9.4	11.0	13.9	28.9	35.1	55.8
3. Non-Hispanic Black	2.0	2.7	3.7	9.4	15.7	37.8
4. Hispanic	3.5	5.1	6.5	11.3	17.5	44.0
<u>B. Racial/Ethnic Differences in 75% Replacement Rates</u>						
<u>I. 1989</u>						
1. Black Minus white households	-5.0	-6.4	-9.3	-11.8	-5.0	-8.2
2. Hispanic Minus white households	-2.0	-3.4	1.1	-1.4	0.1	-1.9
<u>II. 2001</u>						

1. Black Minus white households	-6.9	-8.7	-10.9	-16.2	-15.9	-14.1
2. Hispanic Minus white households	-7.0	-8.4	-10.3	-17.3	-20.1	-16.5
<u>III. 2007</u>						
1. Black Minus white households	-3.8	-4.8	-5.1	-11.2	-12.4	-15.0
2. Hispanic Minus white households	-1.6	-2.6	-5.4	-10.6	-14.6	-16.3
<u>III. 2019</u>						
1. Black Minus white households	-7.4	-8.3	-10.2	-19.5	-19.5	-18.0
2. Hispanic Minus white households	-5.9	-5.9	-7.5	-17.6	-17.6	-11.8
<u>C. Time Trends: Percentage Point Differences</u>						
<u>I. 2007 Minus 1989</u>						
1. All Households, Ages 47-64	2.4	2.4	2.4	8.3	9.5	10.4
2. Non-Hispanic white	2.1	2.1	2.1	8.6	11.2	12.1
3. Non-Hispanic Black	3.4	3.7	6.4	9.3	3.9	5.2
4. Hispanic	2.6	2.8	-4.4	-0.6	-3.4	-2.3
<u>III. 2019 Minus 2007</u>						
1. All Households, Ages 47-64	0.9	1.2	0.9	5.5	0.3	0.6
2. Non-Hispanic white	2.1	2.4	2.4	8.3	2.7	1.8
3. Non-Hispanic Black	-1.5	-1.2	-2.8	0.0	-4.4	-1.2
4. Hispanic	-2.2	-0.9	0.3	1.4	-0.3	6.2
<u>III. 2019 Minus 1989</u>						
1. All Households, Ages 47-64	3.2	3.6	3.3	13.8	9.7	11.0
2. Non-Hispanic white	4.2	4.5	4.5	17.0	14.0	13.9
3. Non-Hispanic Black	1.8	2.6	3.6	9.3	-0.5	4.0
4. Hispanic	0.4	1.9	-4.1	0.7	-3.7	3.9

Table 8. Percentage of Households in Age Group 47-64 Meeting Minimum Expected Replacement Rate Standards, Based on Expected Income at Retirement, 1989-2019

	Replacement Rates			
	25%	50%	75%	100%
<u>I. 1989</u>				
1. All Households, Ages 47-64	89.6	61.9	40.7	21.2
2. Non-Hispanic white	93.1	64.7	41.9	22.0
3. Non-Hispanic Black	71.6	46.0	33.7	15.3
4. Hispanic	82.2	61.6	40.0	24.8
<u>II. 2001</u>				
1. All Households, Ages 47-64	94.5	71.5	48.8	32.2
2. Non-Hispanic white	96.4	74.5	51.7	34.7
3. Non-Hispanic Black	84.4	58.7	37.6	21.1
4. Hispanic	90.2	58.1	35.2	22.3
<u>III. 2007</u>				
1. All Households, Ages 47-64	95.4	74.5	51.1	32.5
2. Non-Hispanic white	96.1	76.6	54.0	35.2
3. Non-Hispanic Black	92.4	67.5	39.0	21.9
4. Hispanic	93.5	61.2	37.7	18.9
<u>IV. 2019</u>				
1. All Households, Ages 47-64	94.5	73.4	51.6	35.2
2. Non-Hispanic white	95.5	76.6	55.8	38.7
3. Non-Hispanic Black	89.5	62.0	37.8	22.8
4. Hispanic	94.6	68.8	44.0	29.8
<u>B. Racial/Ethnic Differences in Replacement Rates</u>				
<u>I. 1989</u>				
1. Black Minus white households	-21.6	-18.7	-8.2	-6.7
2. Hispanic Minus white households	-10.9	-3.0	-1.9	2.8
<u>II. 2001</u>				
1. Black Minus white households	-12.0	-15.8	-14.1	-13.6
2. Hispanic Minus white households	-6.3	-16.5	-16.5	-12.4
<u>III. 2007</u>				
1. Black Minus white households	-3.6	-9.1	-15.0	-13.3
2. Hispanic Minus white households	-2.6	-15.5	-16.3	-16.3
<u>III. 2019</u>				
1. Black Minus white households	-6.0	-14.6	-18.0	-15.9

2. Hispanic Minus white households	-0.9	-7.9	-11.8	-8.9
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C. Time Trends: Percentage Point Differences

I. 2007 Minus 1989

1. All Households, Ages 47-64	5.9	12.6	10.4	11.3
2. Non-Hispanic white	2.9	11.9	12.1	13.2
3. Non-Hispanic Black	20.8	21.5	5.2	6.7
4. Hispanic	11.3	-0.5	-2.3	-5.9

III. 2019 Minus 2007

1. All Households, Ages 47-64	-1.0	-1.1	0.6	2.7
2. Non-Hispanic white	-0.5	0.0	1.8	3.5
3. Non-Hispanic Black	-2.9	-5.5	-1.2	0.9
4. Hispanic	1.1	7.6	6.2	10.9

III. 2019 Minus 1989

1. All Households, Ages 47-64	4.9	11.5	11.0	14.0
2. Non-Hispanic white	2.4	11.9	13.9	16.7
3. Non-Hispanic Black	18.0	16.0	4.0	7.6
4. Hispanic	12.4	7.1	3.9	5.0

Source: author's computations from the 1989, 2001, 2007, and 2019 SCF.

Total retirement income includes expected future gains on all components of net worth NW.

Households are classified by the age of the head of household. Also see notes to Table 2.

Appendix: Estimation of Pension and Social Security Benefits

The computations of retirement benefits use the following steps:

1. Defined benefit pension benefits

Defined benefit (DB) pension benefits consists of two main components:²⁷ (1) DB benefits for head and spouse from past jobs and (2) DB pensions from current jobs for head and spouse. Expectations data are used for calculations.

The procedure is as follows. Pension coverage is first ascertained for current jobs. There are five possible categories: (1) covered and vested, anticipates benefits; (2) covered but not vested yet, anticipates benefits; (3) covered but not vested yet, does not anticipate benefits; (4) not covered but anticipates will be (the age when expected to be covered is ascertained); and (5) not covered, never will be.

For those who are covered by a pension plan or expect coverage, the person is asked how many distinct pensions plans he or she is covered by. For each plan, the age at which the pension benefits are expected to be given is then asked.

The actual expected annual retirement benefit is then determined by the following steps. First, the age at which the respondent will be vested in each plan is determined. Second, the age at which the respondent could retire with full benefits is ascertained. Third, the respondent was asked the nature of the formula used to determine the retirement benefits. There are six possibilities: (1) retirement formula based on age; (2) retirement formula based on years of service.; (3) retirement formula based on meeting both age and years of service criteria; (4) retirement formula based on the sum or age and years of service; (5) retirement formula based on meeting either age or years of service criteria; and (6) other combinations or formulas.

Fourth, the age at which the respondent could retire with some benefits was asked. The same six choices of the formula used were then given. Fifth, the age at which the respondent expected benefits to start was then asked.

Sixth, the expected retirement benefit was computed depending on the type of formula. This consists of three possibilities. (1) The annual pay in the final year of the job was computed. This variable, used in pension benefit calculations, is computed by projecting current pay to the year respondents say he/she will leave the job or retire. This projection is based on human capital earnings equations detailed in Appendix Section 4.1.3 below and a real discount rate of 2.0

²⁷ A third though minor component is also provided: pensions from other non-specified sources.

percent. Wage growth is based on the historical change in the Bureau of Labor Statistics' mean hourly wages series for non-supervisory workers for the period and of hours worked per week from 1979 to 2019.²⁸

(2) In some cases, the respondent reported expected retirement benefits. This variable is the expected dollar retirement benefits in the first year of eligibility as answered by the respondent. For some observations the dollar amount was reported directly, but for others it was computed by multiplying reported benefits as a percentage times the calculated projected final wage. The variable is given as an annual amount except when a lump sum is expected (in which case the lump sum amount is given).

(3) In some cases, the respondent reported expected retirement benefits as a percent of final pay. This variable is the expected retirement benefits in the first year of eligibility as answered by the respondent, expressed as a percent of their projected wages in their final year of work. For some observations the percent was reported directly, but for others it was computed by dividing the reported dollar benefit by the calculated projected final wage.

Seventh, on the basis of the responses above, the annual pension benefits from each current and past plan applicable to both head and spouse were then computed. This variable is measured assuming an annual (or lump sum) pension benefit as given above, starting in the year of first benefits

2. Social Security benefits

Among current Social Security benefit recipients, the steps are as follows: First, it was determined the kind of Social Security benefit received. The possibilities are: (1) retirement; (2) disability; (3) both retirement and disability; and (4) other kind. Second, the respondent was asked the number of years receiving Social Security benefits. Third, both head and spouse were asked the amount received in the survey year.

Among future recipients, the steps are as follows. First, both head and spouse were asked to report the age at which they expected to receive Social Security benefits (zero if he or she does not expect benefits). Second, the number of years until the start of Social Security benefits was

²⁸ These figures are based on the Bureau of Labor Statistics (BLS) hourly wage series. The source is Table B-30 of the Economic Report of the President, 2022, available at <https://www.govinfo.gov/content/pkg/ERP-2022/pdf/ERP-2022-table30.pdf>. The BLS wage figures are converted to constant dollars on the basis of the Consumer Price Index (CPI-U). I use the BLS series rather than one of the alternatives to project future wages because it likely corresponds closest to changes in the Social Security wage base over time due to the cap on social Security earnings that enter the Social Security benefit formula.

determined. Third, the respondent was asked the total number of years on Social Security jobs to current date. If this was not answered, then an estimate of Social Security coverage was used, summing over current and three possible past jobs. Fourth, an estimate of future years on Social Security jobs was computed from retirement years indicated by head and spouse.

Fifth, data on number of years on Social Security jobs, wage rates for each known job, estimates of retirement dates, and dates of starting benefits were used as inputs to Social Security formulae to compute benefits. Sixth, estimates of Social Security benefits were provided. A calculated value was based on current job wage. All persons were assumed to work continuously until their stated age of full-time retirement, and then part-time until their stated age of final retirement. All persons were assumed to retire no later than 72 or age plus one if currently over 72. Persons not currently working and over 50 were assumed not to work again. Wages were calculated by projecting current wages by the same method used to calculate final wages. This projection is based on human capital earnings equations detailed in Appendix Section 4.1.3 below and a real discount rate of 2.0 percent. Wage growth is based on the historical change in the Bureau of Labor Statistics' mean hourly wages series for non-supervisory workers for the period and of hours worked per week from 1979 to 2019. Part-time years (if currently working full-time) were assigned wages equal to one half the projected full-time wages or the maximum amount allowable for full benefit receipt allowed by Social Security, whichever was smaller.

Seventh, the Social Security AIME (Average Indexed Monthly Earnings) used as the basis of computing the Social Security benefit base was computed. The variable is the average covered Social Security earnings per month (including zeros) for all years from 1951 or age 22 (whichever was later) to age 60. These are indexed by a Social Security wage index to the year the respondent turned 60. Years after 60 can be substituted at nominal value. The five lowest years are dropped before an average AIME is computed. These procedures are mimicked using the SCF data on job earnings and future retirement plans to estimate an AIME value. Past and current job wages are projected back (and forward) to estimate earnings for each known year of work. As before, these projections are based on human capital earnings equations detailed in Appendix Section 4.1.3 below and a real discount rate of 2.0 percent. Wage changes are based on the historical change in the Bureau of Labor Statistics' mean hourly wages series for non-supervisory workers for the period and of hours worked per week from 1979 to 2019. Other years of unknown jobs are filled in with terms from the closest known job to fill in the total

number of Social Security covered years. Wages are then capped at the actual or projected Social Security maximum and minimum coverage amounts. The AIME was then computed using actual or projected Social Security wage indices. The variable is currently estimated for all persons projected to have future Social Security benefits.

Eighth, the Social Security PIA (Primary Insurance Amount) on an annual basis is the basis of the calculation of Social Security benefits. It is computed from the AIME. Calculations here take account of legislatively planned changes in this formula. The PIA is currently computed for all non-receivers projected to have future Social Security benefits.

Ninth, spousal benefits are also assumed at 50 percent of the primary benefit if a spouse is present. However, this variable will be zero if no spousal benefits are expected (such as when the individual's own benefits are larger than their spousal benefits). The age at which spousal benefits begin is estimated. The age at which widow's benefits first could be drawn is also estimated. It is an estimate of the age at which the individual could start to receive Social Security widow's benefits upon the death of the spouse. This variable will be zero if widow's benefits could never be drawn. An adjustment is also made if it appeared that the recipient's benefits had been reduced because of work.

3. Human capital earnings equations

The regression equations used to compute future and past earnings are as follows: Human capital earnings functions are estimated by gender, race, and schooling level. In particular, the sample is divided into 16 groups by the following characteristics: (i) white and Asian versus African-American and Hispanic; (ii) male and female; and (iii) less than 12 years of schooling, 12 years of schooling, 13 to 15 years of schooling, and 16 or more years. For each group, an earnings equation is estimated as follows:

$$\ln(E_i) = b_0 + b_1 \text{Log}(H_i) + b_2 X_i + b_3 X_i^2 + b_4 SE_i + \sum_j b_j \text{OCCUP}_{ij} + b_{10} \text{MAR}_i + b_{11} \text{AS}_i + \varepsilon_i,$$

where $\ln$ is the natural logarithm; E_i is the current earnings of individual i ; H_i is annual hours worked in the current year; X_i is years of experience at current age (estimated as age minus years of schooling minus 5); SE_i is a dummy variable indicating whether the person is self-employed or working for someone else; OCCUP is a set of five dummy variables indicating occupation of employment: (a) professional and managerial; (b) technical, sales, or administrative support; (c) service; (d) craft, and (e) other blue-collar, with farming the omitted category; MAR is a dummy

variable indicating whether the person is married or not married; AS is a dummy variable indicating whether the person is Asian or not (used only for regressions on the first racial category); and ε is a stochastic error term. Future earnings are projected on the basis of the regression coefficients.²⁹

4. Questions on work history

Following is a sample of questions on work history drawn from the 1989 SCF codebook that is used to calculate the earnings profile of both head and spouse and to calculate the AIME for each:

1. Including any periods of self-employment, the military, and your current job, since you were 18, how many years have you worked full-time for all or most of the year?
2. Not counting your current job, have you ever had a full-time job that lasted for three years or more?
3. I want to know about the longest such job you had. Did you work for someone else, were you self-employed, or what?
4. When did you start working at that job?
5. When did you stop working at that job?
6. Since you were 18, have there been years when you only worked part-time for all or most of the year?
7. About how many years in total did you work part-time for all or most of the year?
8. Thinking now of the future, when do you expect to stop working full-time?
9. Do you expect to work part-time after that?
10. When do you expect to stop working altogether?

5. Questions on defined contributions plans

1. Does your employer make contributions to this [Defined Contribution] plan? Does the business make contributions to this plan?
2. What percent of pay or amount of money per month or year does your employer currently contribute?

²⁹ This implicitly assumes that deviations from the regression line in the current year are a result of a transitory component to current income only.

Appendix Table 1. Average Annual Real Rates of Return Used in Annuity Calculations, 1989-2019

Description	Nominal	Real
Residential real estate	3.90	1.57
Businesses	5.41	3.08
Non-home real estate	3.90	1.57
Liquid assets	2.78	0.44
Financial securities	5.13	2.79
Stocks	8.45	6.12
Pension accounts	6.68	4.34
Debt	0.00	-2.34
Inflation (CPI-U-RS average)	2.34	

Notes:

Real Rate of Return = $(1 + \text{nominal rate}) / (1 + \Delta \text{CPI}) - 1$

Residential Real Estate: The source for years 1989 to 2007 is Table 935 of the *2009 Statistical Abstract*, US

Bureau of the Census, available at [<http://www.census.gov/compendia/statab/>]. For years after 2007, the source is:

National Association of Realtors, “Median Sales Price of Existing Single-Family Homes for Metropolitan Areas,” at

<https://www.nar.realtor/sites/default/files/documents/metro-home-prices-q2-2020-ranked-median-single-family-2020-08-12.pdf>

The figures are based on median prices of existing houses for metropolitan areas only.

Businesses: Holding gains (taken from the Financial Accounts of the United States (FA),

Table R.100, divided by equity in noncorporate business (taken from the FA, Table B.100), available at:

<https://www.federalreserve.gov/releases/z1/20200921/z1.pdf>

Non-home real estate: Set equal to that of residential real estate.

Liquid assets: Before 2010, the weighted average of the rates of return on checking deposits and cash, time and saving deposits, and life insurance reserves. The weights are the proportion of these assets in their combined total (calculated from the FA, Table B.100). The assumptions regarding the rates of return are: zero for checking deposits, the rate of return on a 1-month CD (taken from the table “H.15 Selected Interest Rates” published by the Federal Reserve and available at: <http://www.federalreserve.gov/releases/h15/data.htm>) for time and saving deposits and CDs, and, one plus the inflation rate for life insurance reserves.

2010 and after: Weights are based on the SCF. Source for interest rate data is the FDIC:

<https://www.fdic.gov/regulations/resources/rates/previous.html>

Financial securities: The weighted average of the rates of return on open market paper, Treasury

securities, municipal securities, corporate and foreign bonds, corporate equities, and mutual fund

shares. The weights are the proportion of these assets in total financial assets held by the

household sector (calculated from the FA, Table B.100). The assumption regarding the

rate of return on open market paper is that it equals the rate of return on 1-month Finance paper

(taken from the table H.15 “Selected Interest Rates” published by the Federal Reserve and

available at: <http://www.federalreserve.gov/releases/h15/data.htm>). The data for the rates of return

on other assets are taken from the *Economic Report of the President 2020*, Table B-25, available at

<https://www.whitehouse.gov/wp-content/uploads/2020/02/2020-Economic-Report-of-the-President-WHCEA.pdf>

The assumptions regarding Treasury securities, municipal securities, corporate and foreign bonds, and

corporate equities are, respectively, average of Treasury security yields, high-grade municipal

bond yield, average of corporate bond yields, and annual percent change in the S&P 500 index.

Mutual fund shares are assumed to earn a rate of return equal to the weighted average of the rates

of return on open market paper, Treasury securities, municipal securities, corporate and foreign

bonds, and corporate equities. The weights are the proportions of these assets in the total financial

assets of mutual funds (calculated from the FA, Table L.123).

Stock prices: Table B-96 of the *Economic Report of the President, 2013*, available at

available at <http://www.gpoaccess.gov/eop/tables13.html>, with updates to 2016 from:
<http://www.fedprimerate.com/s-and-p-500-history.htm>

Pension (DC) Accounts: Weighted average of returns on stocks, bonds, and money market funds, where the weights are based on the average portfolio composition of DC accounts over the period .

CPI-U-RS: from www.bls.gov/cpi/research-series/home.htm