

Developments in the Retirement Security of Black and Hispanic Households in the US: A
Setback for Black Americans but Continued Progress for Hispanics

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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 on four components: (i) standard non-pension wealth holdings, (ii) defined contribution pension holdings, (iii) expected defined benefit pension entitlements, and (iv) expected Social Security benefits. The first two components are converted into an annuity. Calculations are based on the Survey of Consumer Finances. Black and Hispanic households both made remarkable progress in terms of mean and median retirement income, poverty reduction, and replacement rates from 1989 to 2007. However, from 2007 to 2019, fortunes reversed for Black households, with median retirement income declining, the poverty rate rising, and replacement rates falling, though mean retirement income rose. Hispanics also experienced a setback in mean retirement income but continued progress in median retirement income, replacement rates and poverty reduction.

Keywords: retirement income, inequality, racial inequality, household wealth, Social Security, pensions

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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. Section 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. A sensitivity analysis using alternative replacement rates is reported in Appendix 2.

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. Fisher et. al. (2005) use 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.

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. 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 fall 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.

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. 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. Second, 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. 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 does 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, 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). 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. Typically, about two thirds of the cases came from the representative sample and one third from the high-income supplement.

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. Total assets are defined as the sum of: (1) owner-occupied housing; (2) other real estate; (3) bank deposits, certificates of deposit, and money market accounts; (4) financial securities; (5) the cash surrender value of life insurance plans; (6) the value of defined contribution (DC) pension plans, including IRAs and 401(k) plans; (8) corporate stock and mutual funds; (9) equity in unincorporated businesses; and (10) 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.

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. 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. 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 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 1 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 1), not on employer-provided pension plans.

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 1 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.¹ Here, too, it should be noted that estimates of future Social Security benefits are based on reported earnings at a single point

¹ In the case of a married (or co-habiting) couple, the couple’s expected Social Security benefit is set equal to the sum of the PIA of each worker or 150 percent of the greater of the two PIAs, whichever is greater.

in time. However, I do have *retrospective* information on work history provided by the respondent (see Section 4 of the Appendix 1 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.

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 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 1). 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). Adding DCEMP to DCW would then put DC wealth on the same footing as DB wealth, since both would reflect the retirement benefits at time of retirement due to employer contributions to retirement plans.

The SCF questionnaire indicates how many DC pension plans each spouse has (up to three per spouse). 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. Let EMPAMT 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:

$$(1) \text{ DCEMP}_a = \int_0^{\text{LR}} \text{EMPAMT} e^{-\delta^* t} dt$$

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

$$(2) \text{ DCEMP}_b = \int_0^{\text{LR}} \text{EMPPER} \cdot E_t^* e^{-\delta^* t} dt$$

where E_t^* is the predicted earnings of the worker at time t in constant dollars (see Section 3 of the Appendix 1 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.

² It should be noted that past employer contributions to DC plans are already included in the current market value of DC wealth.

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.

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.³ 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,

³ I am ignoring miscellaneous sources of income such as government transfer payments other than Social Security, alimony payments, and the like.

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 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.⁴ In 2019 As discussed in the Appendix 1, 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.

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. 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.

⁴ 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>.

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 1 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 1 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 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.

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.⁵ 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

⁵ 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.

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. 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 the pertinent literature). 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. 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. Overall projected median retirement income for this age group is \$56,100. 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.

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.

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. 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 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. 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.

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). 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, DC 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 in 1989 to 5.1 percent in 2019. Together, the contribution of total pension wealth to projected retirement income will rise from 30.8 to 32.2. 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 and 39.0 percent for Hispanics, compared to 12.4 percent for whites, whereas the expected annuity from non-pension wealth NWX will constitute only

26.1 percent for Blacks and 27.7 percent for Hispanics, compared to 56.4 percent for whites. In comparison, there is less variation in the share of DCTOT across the three groups. DB benefits are projected to account for 12.7 percent of the retirement income of Black families and 14.1 percent for Hispanics, both much higher than that of whites. Over time, the share of retirement income from DCTOT will rise and that from DB pensions will fall for all three groups.

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 NWX are much lower, at 13.6 and 19.1 percent, respectively. The ratio of the expected annuity from 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 78.4 percent between 1989 and 2007 and then advances more slowly by 21.1 percent over 2007-2019. The expected annuity from NWX also grows strongly in the earlier period, by 84.6 percent but rises by only 24.9 percent in the later period. The DCTOT component more than triples in the first period and then gains two-thirds in the second. Expected DB pension benefits remain largely unchanged in the earlier period but then plummet by almost half in the second. Expected Social Security benefits, in contrast, rise sharply in the first period, by over half, and then remain largely unchanged in the second. As a result, the share of NWX in total retirement income shows a modest uptick from 1989 to 2019 while the share of Social Security benefits drops (see Table 2). The DCTOT portion climbs by 16.8 percentage points, while that of DB pensions benefits falls by 15.4 percentage points.

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 over the first period 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 more than double among the former but grow by only half among the latter, 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).⁶

The expected annuity from NWX grows about the same for Blacks and whites from 1989 to 2007 (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 28.0 percent for Black households (Table 4). The share of expected Social Security benefits in expected retirement income also rises among Blacks whereas it falls among whites (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 in 2007 and also a much higher proportion from pensions (DC plus DB) and a correspondingly much smaller share from NWX (Table 2).

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 only 1.6 percent among Black households. This in turn can be traced to the fact that the Black/white ratio of net worth 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 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).

On net, the ratio of expected Social Security benefits between Black and white households declines from 0.700 in 2007 to 0.655 in 2019 (Table 3). However, Black families will still obtain a much higher share of their retirement income from Social Security than whites in 2019 and also a higher portion from total pensions and a correspondingly much smaller segment from NWX (Table 2). The ratio of retirement income generated by NWX is likewise down, while the ratio in the annuity from DCTOT and that from future DB benefits are up.

⁶ 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.

Results are 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, the DCTOT component surges four times faster for Hispanics, and projected Social Security benefits rise modestly more for Hispanics. 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.

The share of expected Social Security benefits in expected retirement income declines slightly among Hispanics from 1989 to 2007, whereas it falls more among whites (Table 2). As a result, the ratio of mean expected Social Security benefits between the two groups rises slightly (Table 3). Hispanics will obtain a much higher portion of their retirement income from Social Security than whites in 2007, a somewhat higher proportion from total pensions, and, as a consequence, a much smaller segment from NWX (Table 2). The ratio of the expected annuity from NWX between Hispanics and whites rises slightly from 1989 to 2007 while that emanating from DCTOT climbs from 0.111 to 0.314 (Table 3).

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. 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 81.1 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. 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 in 2019 and also a somewhat higher portion from pensions, and a correspondingly much smaller proportion from NWX (Table 2). The ratio of retirement income generated by NWX is likewise down, as is the ratio from DCTOT (Table 3).

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.⁷ 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 takes 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.

⁷ 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.

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 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 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 2019, Black families 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 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. 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 1989-2007. 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 points lower than 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, while the addition of Social Security benefits actually increases the poverty rate by 2.2 percentage points. 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.

There are marked differences in time trends for minority 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. 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. 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 noted above. 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 are rising at about the same rate, at least until 2007.⁸ 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

⁸ 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.

5.9 percentage points -- reflecting the widespread growth of these plans. DB benefits and Social Security benefits provide about the same marginal contribution in the two years.

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, reflecting the continued expansion of these plans, while that from DB benefits correspondingly falls off from 11.4 to 6.2 points, reflecting their continued collapse.

Somewhat surprisingly, the percentage 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 NWX (9.3 percentage points), and a smaller contribution emanates from DCTOT (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, differences in NWX contribute 5.1 percentage points, less than in 1989. However, the gap in DCTOT makes an even larger marginal contribution in 2007 than in 1989. 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.

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, DB benefits have a neutral effect, but the marginal contribution of Social Security benefits now moves slightly in favor of Black families.

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, while the payout from DCTOT once again favors whites and to the same degree. DB benefits also help Latinos more than whites but the advantage is smaller. Social Security benefits once again benefit whites more than Latinos.

Hispanic-white differences in 2007 are almost identical to racial differences. Latino-white gaps by component are once again similar to racial disparities in 2019. However, differences in Social Security benefits now favor Latinos by 5.8 percentage points.

5. Summary and Concluding comments

Black households make substantial progress between 1989 and 2007. Their mean retirement income grows by 87 percent, their median retirement income is up by a factor of four, their expected poverty rate at retirement plummets by 42 percentage points from 56 to 14 percent, and the percentage of households with expected retirement income greater than or equal to 75 percent of their projected income at age 64 rises by five percentage points from 34 to 39 percent.

Black households then experience a reversal of fortune from 2007 to 2019. Their median retirement income drops by 29 percent, their expected poverty rate at retirement spikes by 8 percentage points to 22 percent, and the share meeting the replacement standard falls by a percentage point, though their mean retirement income does rise by 9 percent.

Why the reversal of fortune? Black families were hammered by the Great Recession, much more so than white families. Their mean and median net worth declined in absolute terms between 2007 and 2019. The Great Recession is in many ways the line of demarcation between the substantial headway made from 1989 to 2007 and the retrenchment after 2007.

In relative terms, the ratio of mean expected retirement income between Black and white families first shows a sizeable gain from 0.34 in 1989 to 0.36 in 2007 but then a pronounced retreat to 0.30 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 divergence after 2007 is mainly due to the much faster growth in the expected annuity from non-pension wealth among whites. This climbs by 38 percent, compared to 2 percent among Black households. It also accounts for 65 percent of the change in mean expected retirement income for whites, compared to only 5 percent for Black households.

Expected Social Security benefits will make up a much higher share of the expected retirement income of Black than white households, while the expected annuity from non-pension wealth will constitute a significantly higher proportion for whites. DB benefits are projected to account for a larger portion for Black families than whites.

The gap in projected poverty rates between Black and white families likewise falls sharply from 1989 to 2007, from 50 percentage points to only 9 percentage points. Much of the decline in the Black poverty rate, both in absolute and relative terms, is traceable to the larger impact of Social Security on reducing Black poverty and another significant portion is from the accumulation of DC pensions. The pattern reverses by 2019, with the racial gap widening to 16 percentage points. In this case, the cause is the diminished effectiveness of non-pension wealth in reducing poverty in the Black community.

The percentage of households meeting the 75 percent replacement rate standard is higher for white than Black households, despite their higher pre-retirement income. As a result, there is a sizeable gap between whites and Black families, 8 percentage points in 1989 and 15 percentage points in 2007. The gap widens even further to 18 percentage points in 2019. Most of the gap comes from differences in the accumulation of non-pension wealth.

The time pattern is different for Hispanic families. Mean retirement income shows a 61 percent advance from 1989 to 2007 and then retreats by 12 percent from 2007 to 2019. Median retirement income gains 93 percent over the earlier period and then becomes flat over the later one. The Hispanic poverty rate shows a largely uninterrupted decrease from 40 to 14 percent, while the proportion meeting the 75 percent replacement standard first falls from 40 percent in 1989 to 35 percent in 2001 and then sharply increases to 44 percent in 2019.

The ratio of mean retirement income between Hispanics and whites exhibits a fairly continuous drop between 1989 and 2019, while the ratio of median retirement income largely advances. The ratio of mean retirement income declines from 0.66 in 1989 to 0.58 in 2007 and then falls sharply to 0.39 in 2019. The first drop-off is essentially a weighted average effect. For 2007-2019, the main factor is income from non-pension wealth, which plunges by 29 percent for Hispanics but climbs by 38 percent for whites. Expected Social Security benefits will make up a much higher share of the expected retirement income of Hispanic households than white households, while the expected annuity from non-pension wealth will constitute a significantly higher proportion for whites.

The gap in projected poverty rates between Hispanics and whites likewise falls sharply, from 34 percentage points in 1989 to 13 percentage points in 2007 and then to 8 points in 2019. Over years 1989 to 2007, the growth in anticipated income from non-pension wealth decreases the Hispanic poverty rate by 12 percentage points. However, adding Social Security benefits has

virtually no influence on the Hispanic poverty rate. From 2007 to 2019, the slowdown in growth of non-pension wealth raises the expected Hispanic poverty rate by 5 percentage points, while increases in Social Security benefits decrease their poverty rate by 6 percentage points.

The gap in replacement rates between Hispanics and whites widens sharply between 1989 and 2007 and then falls off in 2019. Most of the relative gain made by Hispanics in the later period can be traced to the rising importance of Social Security in Hispanic retirement income.

The racial and ethnic 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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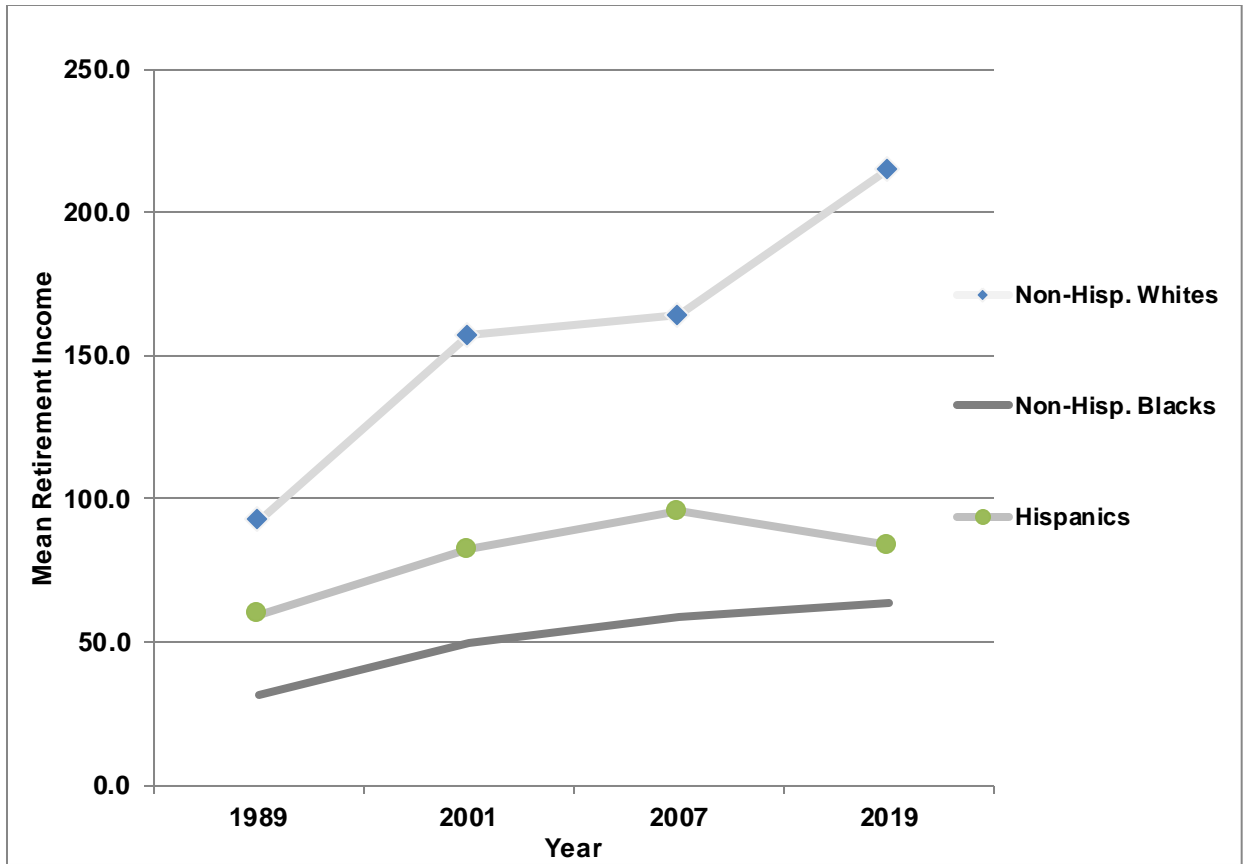


Figure 1. Mean retirement income (in 1000s, 2019 dollars)

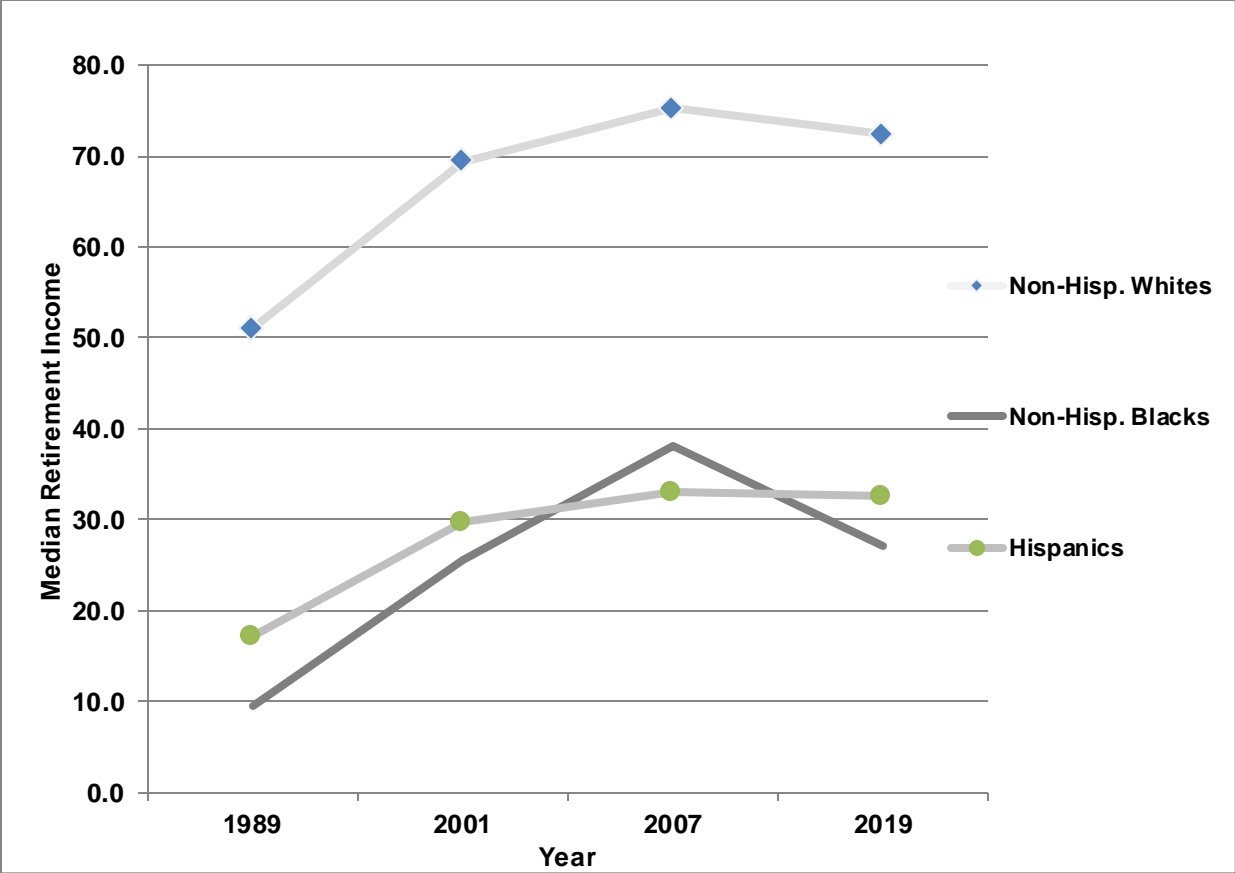


Figure 2. Median retirement income (in 1000s, 2019 dollars)

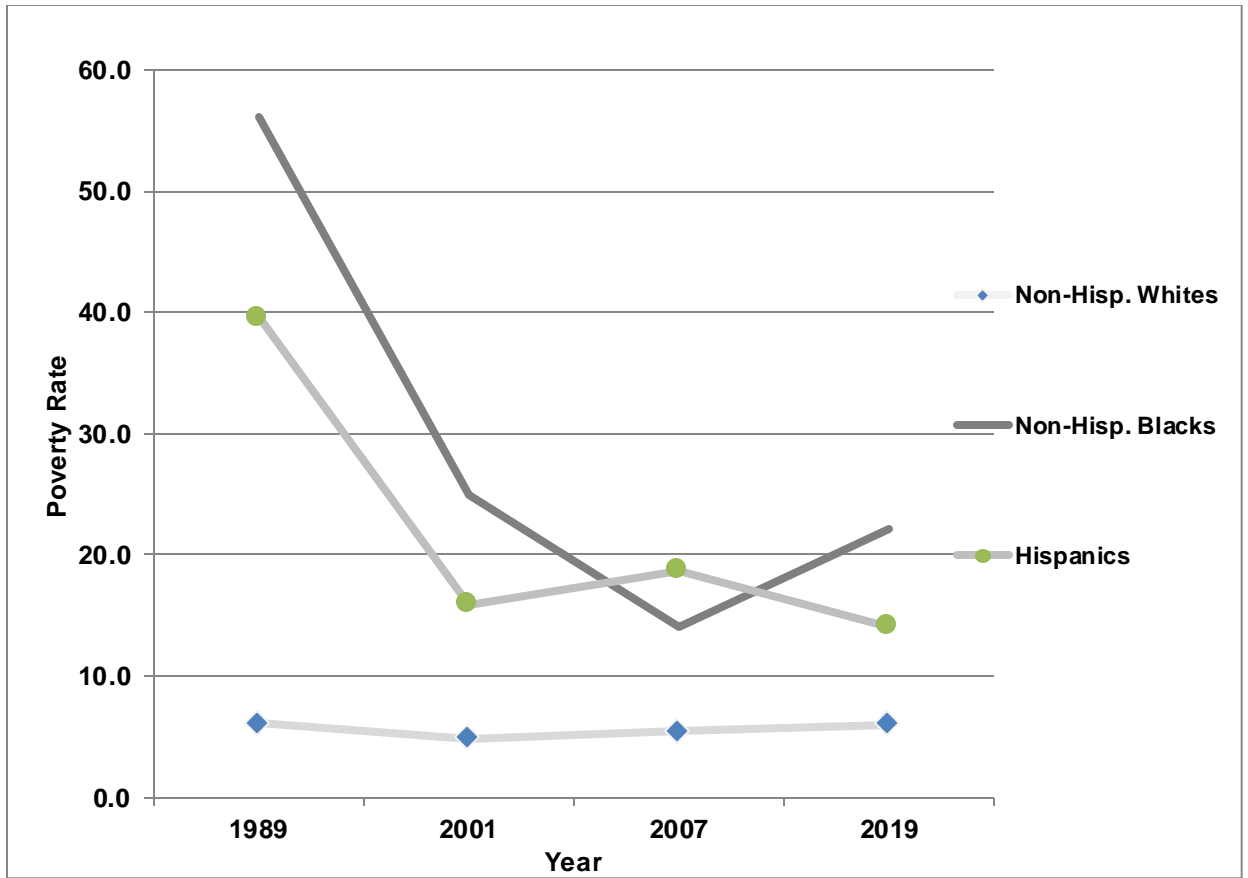


Figure 3. Percentage of Households with Expected Retirement Income Less Than the Poverty Line

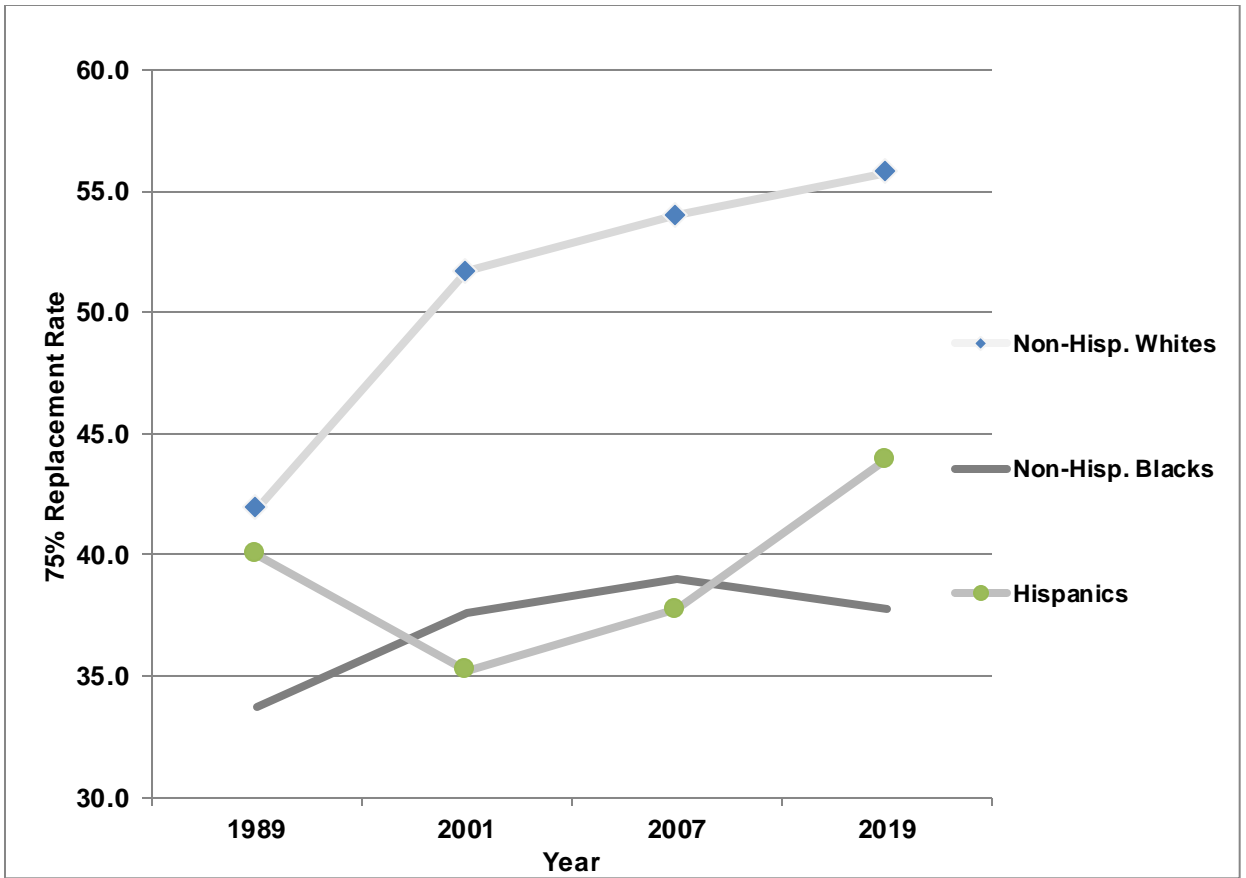


Figure 4. Percentage of Households Meeting 75% Replacement Rate

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

(In thousands, 2019 dollars)

	1989	2001	2007	2019	Annual percentage rate of growth			
					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				

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

	Non-Home Non-Pension Wealth (FWX)	Home Equity (HE)	DC Plans (DCTOT)	DB Pensions	Social Security	Total
<u>A. Ratios in Mean Retirement Income</u>						
<u>1. 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
<u>2. 2007</u>						
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
<u>3. 2019</u>						
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
<u>B. Percentage Change over Time</u>						
<u>1. 1989-2007</u>						
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
<u>2. 2007-2019</u>						
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
<u>3. 1989-2019</u>						
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. 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	Change			
					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. 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. 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

C. Time Trends: Percentage Point Differences

I. 2007 Minus 1989

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

II. 2019 Minus 2007

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

III. 2019 Minus 1989

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. 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>III. 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. 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

C. Time Trends: Percentage Point Differences

I. 2007 Minus 1989

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

II. 2019 Minus 2007

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

III. 2019 Minus 1989

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

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.

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Appendix 1. 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:⁹ (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

⁹ 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 2019.¹⁰

(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

¹⁰ 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.¹¹

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?

¹¹ 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 2. Sensitivity Analysis Using Alternative Replacement Rates

Similar patterns exist when we look at different cut-off points for replacement rates (Appendix Table 2). 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.

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-URS: from www.bls.gov/cpi/research-series/home.htm

Appendix Table 2. Percentage of Households in Age Group 47-64 Meeting Minimum Expected Replacement Rate Standards, Based on Expected Income at Retirement, 1989-2019
(In percentage)

	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. 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>III. 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. 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
<u>C. Time Trends: Percentage Point Differences</u>				
<u>I. 2007 Minus 1989</u>				
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
<u>II. 2019 Minus 2007</u>				
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
<u>III. 2019 Minus 1989</u>				
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.

See notes to Table 2.