Is Social Security Wealth?

Abstract

Wealth inequality has grown significantly over the last three decades and there are growing concerns about the diminishing wealth share of the middle class. Standard wealth definitions require that individuals possess a legal claim to any assets included as wealth. Consequently, accrued Social Security benefits are not considered wealth because workers and retirees lack a legal claim to receipt of those benefits. However, as of 2014 these accrued benefits were estimated to be $31 trillion, or over 40% the size of conventional measures of household wealth. Though they do not meet the formal definition of wealth, the existence of these benefits affected the lifecycle savings behavior of current recipients and will affect the savings behavior of current workers.

This study identifies Social Security wealth as the accrued benefits based on past participation in the program. This definition is similar accrued pension wealth associated with defined benefit plans. The distributions of accrued Social Security benefits for the years 1985 to 2006 are derived from individual earnings record available in the Social Security Administration's 2006 Earnings Public Use File. The estimated accrued Social Security benefits are much more evenly distributed than are the estimates of savings wealth. Individuals in the top 10% of the estimated wealth distribution, excluding Social Security, held 70% of wealth as of 2006, but only 33% of accrued Social Security benefits. Once accrued Social Security benefits are included in a total wealth measure, the percent of the total attributable to the top 10% declines to between 55% and 62%.

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Introduction

Income inequality has steadily increased in recent years and this rise has been linked to the rise in wealth inequality. With rising income inequality and uniform savings rates across the income distribution, the resulting wealth distribution will over time reflect the income distribution. But if higher income workers also have higher savings rates, the concentration of wealth at the top of the distribution will be further accentuated. Saez and Zucman (2014), hereafter referred to as SZ, attribute much of the rise wealth concentration at the very top of the distribution to the combination of these mechanisms.

In the SZ study, aggregate wealth is attributed to families through capitalized income tax data. Net worth, is defined as the sum of a family's assets, at market value, less any liabilities. Assets are identified at market value and the family must possess a legal claim to the assets. Such assets include the market value of a family's home less the outstanding mortgage amount as well as the value of proprietorships and partnerships, financial instruments like stocks and bonds held outside of retirement accounts. Finally, wealth also includes the value of defined contribution retirement accounts and the accrued value of defined benefit pensions.

Absent from this family wealth measures are accrued Social Security and Medicare benefits given that individuals do not have a legal claim to receipt of those benefits. In SZ's study accrued pensions and other retirement benefits payable to federal civilian and military personnel are also excluded because receipt of those benefits rely on current and future tax funding rather than private market financial assets. But, accrued Social Security benefits and accrued pension benefits payable to federal employees and retirees are substantial. As of 2014, the Social Security Administration estimated that accrued benefits came to $31 trillion. The accrued pension and disability benefits expected by current and retired federal civilian and military personnel were $5.5 trillion in 2014. To put these amounts in perspective, an adjusted measure of the net worth of households and nonprofit organizations, from the Federal Reserve's Flow of Funds accounts, was $75 trillion in 2014.[1] Thus, accrued Social Security benefits were over 40% of the size of the conventional measure of wealth.

Though they do not meet the formal definition of wealth, the existence of Social Security benefits affected the lifecycle savings behavior of current recipients and they will affect the savings behavior of current workers. But accrued Social Security benefits are not formally recognized as liabilities of the federal government or as assets of current of future beneficiaries. The lack of an enforceable property right is the primary reason they are neither liabilities nor assets. One can argue

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[1] This adjusted net worth measure subtracts consumer durables and nonprofit's assets and liabilities from the assets and liabilities of households and nonprofit organizations from Z.1 Financial Accounts of the United States.

that because Congress can unilaterally change the programs and because workers do not possess a legal claim to their benefits, they should not be included in the federal government's liabilities. By similar reasoning it is argued that they are not assets to individuals.

However, it can also be argued that individuals behave as if they possess a legal claim to the benefits. Families reduce their private wealth accumulation in light of the expected payments from the programs. In targeting a desired retirement income replacement rate, workers begin with their expected replacement rate from Social Security and adjust their lifetime savings to fill the remainder. There is, however, considerable disagreement about the degree to which Social Security affects aggregate national savings and capital accumulation and how it affects individual's lifecycle savings, particularly in the context of models that assume workers care about the tax burdens on future generations that result from current policies.

This paper examines how the inclusion of accrued Social Security benefits in a comprehensive wealth measure affects measured wealth inequality. I find that accrued Social Security benefits are much more equally distributed than are the conventional measures that exclude them. As of 2006, the last year in the data file I use, the top 10% of individuals based on their savings wealth held 33% of accrued Social Security benefits. In contrast, these individuals held 70% of savings wealth in that year. When accrued Social Security benefits are included a comprehensive wealth measure, the share of total wealth held by the top 10% declines to 55% to 63%.

Background

Feldstein's (1974) early estimates that Social Security wealth reduced savings and the capital stock by over 30 percent produced a large literature. Barro (1974) suggest that Social Security and government debt are not net wealth given that families are linked through intergenerational exchanges. These exchanges may cancel one another such that national wealth is unaffected. Because Social Security is financed through taxes, children can respond to an increase in Social Security by making fewer transfers to parents, and conversely parents can make more financial transfers to their children who bear the higher tax burden.[2] If, however, generations are only weakly linked, Social Security may indeed reduce savings.

Regardless of Social Security's effect on aggregate savings, the present analysis focuses on how the distribution of Social Security is related to the annual distributions of wealth that are based on

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[2] See Felstein's (1976) comment on Barro (1974) and Barro's (1976) response. See Liemer and Lesnoy (1982), and Feldstein (1982) for further comments on Feldsten (1974).

standard measures of wealth. The work by SZ examines the distributions of wealth since 1913 and finds that wealth inequality has risen since the late 1970s with the share of wealth owned by the top 0.1% of families equal to 22% in 2012. This share is almost as high as in the 1916 and 1929 peaks and three times higher than in the late 1970s. They also find that the wealth share of the bottom 90 percent increased from 20% in the 1920s to 35% by the mid-1980s, but has declined to 23% in 2012. The authors attribute the decline in the bottom 90% share to the fall in the middle-class saving rate and to rising income inequality.

SZ include as assets "all the non-financial and financial assets over which ownership rights can be enforced and provide economic benefits to their owners."[3] As mentioned, this wealth definition does not include accrued pension benefits payable to federal civilian and military personnel nor other accrued post-employment benefits, primarily health care, payable to these federal workers because they are not prefunded. Similarly, accrued Social Security benefits and Medicare benefits are not included as wealth both because they are not funded and more importantly because workers do not have ownership rights to the receipt of the benefits.

Discussions of workers' legal claims to Social Security benefits typically reference two Supreme Court rulings from 1937 and 1960. The 1937 case, Helvering v. Davis basically found that "The proceeds of both taxes [employer and employee] are to be paid into the Treasury like internal-revenue taxes and payroll taxes generally, and are not earmarked in any way."[4] Consequently, payment of these taxes did not convey a property right to Social Security benefits. The 1960 case, Flemming vs. Nestor, further confirmed this reasoning. In this case, Nestor challenged a 1954 law that terminated Social Security benefits for "persons deported for, among other things, having been a member of the communist party."[5] Nestor, a Bulgarian immigrant, had been a member of the Communist Party from 1933 to 1939, paid Social Security taxes of 19 years, and was deported in 1956 after already starting the receipt of benefits in 1955. The Supreme Court ruled that Nestor did not have a property right. This ruling was in opposition to Nestor's claim that the denial of his benefits violated the takings clause of the Fifth Amendment. Writing for the majority Justice Harlan wrote, "We must conclude that a person covered

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[3] Saez and Zucman (2014) p.5.
[4] From Social Security History Archives, "Justice Cardozo – Helvering vs. Davis" www.ssa.gov/history/supreme1.html.
[5] From Social Security History Archives, "Supreme Court Case: Flemming vs. Nestor" www.ssa.gov/history/nestor.html.

by the Act has not such a right in benefit payments as would make every defeasance of "accrued" interests violative of the due process clause of the Fifth Amendment."[6]

The following statement from the 2010 *Analytical Perspectives* summarizes the logic of the Nestor decision: "Future Medicare, Medicaid, and Social Security benefits may be considered as obligations of the Federal Government, but these benefits are not a liability in a legal or accounting sense. The Government has unilaterally decreased as well as increased these benefits in the past, and future reforms could alter them again."[7] This statement notes that Social Security benefits are "obligations" but not "liabilities" of the federal government. The government's ability to unilaterally change benefits thus makes Social Security benefits "obligations" not "liabilities" and if they are not liabilities of the government they are not equivalently assets to the beneficiaries. However, while paying Social Security taxes do not endow workers with a legal claim, the expectation of benefits affects worker's savings behavior and wealth accumulation. So, anticipated Social Security benefits are not legal liabilities of the federal government nor are they assets to workers or retirees.

In the analysis of wealth inequality some notion of the size of accrued Social Security and Medicare benefits, as well as the size of accrued retirement benefits payable to federal employees are relevant. This is particularly true in considering policy proposals designed to address wealth inequality. Importantly, the federal government does include the accrued pension and post-employment benefits of federal workers as liabilities in its financial statements. The accrued liability payable to federal employees including all post-employment benefits was $6.7 trillion in 2014. While not included as liabilities in the Financial Report of the US Government (FRUSG), the accrued Social Security and Medicare benefits payable to current retirees are reported in the FRUSG's Statement of Social Insurance. Together the present value of Social Security and Medicare benefits payable to current retirees were equal to $17 trillion in 2014. [8] In addition to the Social Security and Medicare benefits payable to current retirees, near-term retirees and younger workers have accrued considerable benefits in the programs. The closer workers are to retirement age, the more likely they will receive the full anticipated benefit. In what follows, I limit the wealth measure to accrued Social Security benefits (no

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[6] From Social Security History Archives, "Supreme Court Case: Flemming vs. Nestor"
www.ssa.gov/history/nestor.html.
[7] *Analytical Perspectives, Budget of the U.S. Government, Fiscal Year 2010*, p.186.
[8] See p.48 of the 2014 Financial Report of the U.S. Government for the estimate of federal employees' accrued retirement benefits and p. 49-51 for the estimates of Social Security and Medicare benefits expected by current retirees.

accrued Medicare benefits are included) based on participation in the program up to the year of the calculation.

Data

Public use data from the Social Security Administration (SSA) with work histories beginning in 1951 are the basis for the accrued Social Security benefits I calculate for individual workers for each year between 1985 and 2006. These data also provide the basis for my estimates of potential savings wealth. The 2006 Earnings Public-Use File (EPUF) includes annual earnings records between 1951 and 2006 for a 1 percent sample of individuals who were issued Social Security numbers prior to January 1, 2007. There are 4,384,254 unique individuals in the EPUF sample, 3,131,424 of which have earnings greater than zero in at least one year between 1951 and 2006, producing 60,326,474, annual earnings records.[9]

The data are delivered in two files, the demographic and the annual earnings file. The two are linkable by unique individual identification numbers. The demographic file includes the following variables in addition to the identification number year of birth, sex, total earning credits between 1937 and 1950, total credits combined for 1951 and 1952, and aggregate earnings for the years 1937 to 1950. The annual earning file includes these variables: year, annual quarters of coverage, and annual earnings capped at the Social Security taxable maximum.

Several data limitations must be addressed in estimating accrued benefits in each year for each individual as well as in estimating lifetime earnings and potential wealth. The primary limitations are the lack of age of death for each individual and the fact that earnings are capped at the Social Security taxable maximum. These limitations are addressed, producing a large longitudinal data file by which the annual distributions of accrued Social Security benefits and potential wealth can be compared.

For confidentiality, the EPUF does not include age of death. Thus, years in which no earnings are reported for an individual beyond the last reported year may indicate no earnings or that the individual has died. No earnings may also indicate that the worker is no longer in Social Security covered employment. Earnings above the Social Security taxable maximum are imputed using the distribution of earnings above the taxable maximum from the Current Population Survey (CPS) as a guide. The methodology I use to estimate differential mortality by income class and to impute earnings above the taxable maximum is described in the appendix.

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[9] The documentation and the data are available at: https://www.socialsecurity.gov/policy/docs/microdata/epuf/

In the next section I describe how I estimate individual level and aggregate accrued Social Security in each year between 1985 and 2006. The section that follows describes the estimates of potential savings wealth based on the annual earnings records. The relationship between savings wealth and accrued Social Security benefits is then analyzed.

Accrued Social Security Benefit Estimates

Accrued Social Security benefits are conceptually similar to accrued pension benefits from a defined benefit plan. Accrued Social Security benefits are based on past participation in the program, not on the expectation of continued participation. Apart from the lack of an enforceable claim to the receipt of the benefits, accrued benefits meet the definition of an asset from the perspective of workers and they meet the definition of a liability from the perspective of the federal government. This is particular true with respect to the accrued benefits of near-term retirees and the ongoing monthly benefits paid to current retires. Accrued Social Security wealth differs from the gross and net Social Security wealth measures suggested in Feldstein (1974). His gross measure was the present value of expected retirement benefits and the net measure subtracted the present value of lifetime Social Security taxes from the present value of lifetime benefits. Accrued benefits are used here because of their similarity to the pension wealth associated with defined benefit programs and because they approximate relative wealth from the vantage point of workers.

Primary Insurance Amount Estimates

The annual earnings records in the EPUF provide the basis for computing individual level accrued Social Security benefits in each year between 1985 and 2006. Calculating accrued benefits begin with estimating individuals' primary insurance amounts (PIAs) based on their past earnings up to the year under consideration. The procedure I use to calculate accrued benefits for all workers 22 and above in a given year follows the description of the maximum transition cost described by Goss (1999) and in the annual note from the Social Security Administration's office of the actuary (Shultz and Nickerson (2014)). [10]

Basically, the PIA is a worker's monthly benefit should he or she begin receiving benefits at the normal retirement age (NRA), 66 in 2015.[11] The PIA is derived from the worker's average indexed

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[10] See Goss(1999) for a discussion of the Maximum Transition Cost estimate.
[11] The normal retirement age (NRA) is the age at which workers receive 100 percent of their primary insurance amount. Between the start of the program and 2002 the NRA was 65 for workers born in 1937 and earlier. For worker born in 1938 to 1942 the NRA rose 2 months per year until it reached 66 for workers born in 1943. For birth

monthly earnings (AIME). In the case of a worker retiring at the NRA, the AIME is calculated by wage indexing past earnings, determining the highest 35 years of indexed earnings, and then dividing by 420 (35*12).[12] For workers between the ages of 22 and the NRA I also calculate an AIME and the associated PIA based on the benefit formula in place each year. The number of months in the elapsed years since the age of 22 are the denominator for workers who have yet to attain the NRA. The workers' AIMEs are then converted to their PIAs based on the formula in place in the year of the computation.

Figure 1 depicts the relationship between AIMEs and PIAs as of 2014. Ninety percent of average monthly earnings between 0 and $816 are converted to monthly benefits, 32% of additional monthly earnings between $816 and $4,917 are added to the benefit, and then 15% of any earnings beyond $4,917 are added to determine the PIA at the NRA for the birth year. The slope of the ray from the origin to the PIA formula reflects the rate at which the Social Security benefits replace the average indexed earnings. As average wages rise, the replacement rate declines indicating the progressive nature of the benefit formula in calculation of initial benefits.

[Figure 1 here]

For workers at or above the NRA in each year, the computation of their PIAs is straightforward. Younger workers who are yet to retire are credited a portion of their benefits that will be received once they reach the normal retirement age for their birth year, NRA_{by}. Here the factor is (age-22)/(NRA_{by}-22). Thus, for workers younger than the NRA, their PIAs are proportional to their years in the program between 22 and the NRA. However, their proportional PIAs will be received beginning in the year the reach the NRA. The benefit is adjusted to that year by the ratio of the Social Security average wage in the year the worker attains the NRA to the wage in the year of computation.

Once the full or proportional PIAs are determined for each worker, the present values at the age of retirement, for younger workers, or at the age in the computation year, for workers at or above the

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years 1943 to 1954 the NRA is 66, but beginning with birth year 1955 the NRA will again rise 2 months per year until it reaches 67 for birth year 1960. Workers who retire early between ages 62 and the NRA receive reduced benefits relative to their PIA while workers who delay receiving benefits up to the age of 70 receive higher benefits relative to their PIA. For example, workers born in 1949 who first claimed benefits at age 62 receive 75% of their PIA, but those who wait until age 70 to claim benefits receive 132% of their PIA.

[12] This description simplifies the details of the actual calculation. For workers retiring at age 62 and above, past earnings are wage indexed to age 60 based on the Social Security average wage, any nominal earnings after age 60 are also included in the determination of the 35 highest earnings years. In the current exercise I wage index all earnings to the year of the calculation given that I calculated average earnings for workers between 22 and the NRA each year.

NRA, are calculated.[13] Across all years, the present values are estimated assuming a real rate of return

of 2.9% which is the longstanding real rate of return assumption used by the Social Security and

Medicare Trustees in producing their annual reports. The Social Security benefits are assumed to be

received annually up to the assigned conditional life expectancy for each worker (discussed below) who

is at or above the NRA in the computation year and who is estimated to be a survivor to that year. For

workers younger than the NRA in the computation year, the proportional Social Security benefits are

assumed to be received in the year the worker reaches the NRA and to continue up to the assigned

conditional life expectancy. These values at future retirement ages are brought back to the present

using compound interest factor for the 2015 Social Security Trustees Report.[14]

Annual Accrued Benefits

The aggregate annual accrued Social Security benefits I estimate for the years 1996 to 2006 are

presented in Figure 2 alongside the maximum transition cost, including the trust fund offset, as reported

in Schultz and Nickerson (2014). Their estimates are available from 1996 to the present.[15] As

mentioned, my estimates of the aggregate accrued benefits follow the same methodology as described

in Goss (1999) and in Schultz and Nickerson (2014), however, I do not attempt to calculate disability

benefits nor can I identify married couples in the EPUF. Consequently, my calculations approximate the

total Old-Age and Survivors Insurance (OASI) maximum transition costs.

[Figure 2 here]

Over these years my estimates range from 81% to 89% of the maximum transition costs as

reported in Schultz and Nickerson (2014). Besides the omitted benefit categories, my estimates also vary

from Schultz and Nickerson (2014) due to my use of the constant real discount rate through time and

my use of the nominal discount factors from the 2015 Trustees Report rather than the assumptions

from the annual Trustees Reports in each annual calculation. The differential mortality rates will

produce higher accrued benefits for higher income workers, particularly male workers. Additionally, I do

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[13] It was also necessary to estimate the PIAs for workers who retire prior to 1985, those born in 1920 and earlier. Their benefits are estimated using the current benefit formula and annual earnings from 1937 to 1950 are estimated from the aggregated earnings for these years that are available in the EPUF.

[14] The long-run real interest rate and the nominal compound interest factor are from TableV.B2. and Table VI.G6., respectively in the 2015 Social Security Trustees Report. All workers are assumed to begin receipt of their retirement benefits at the NRA for their birth year. This abstracts from the actual experience of different workers, however, the benefit reductions for earlier retirement ages the delayed credits for later retirements ages are roughly actuarially fair, so the assumption used here is a reasonable approximation.

[15] See Schultz and Nickerson (2014) Table 3.

not subtract income taxes on Social Security benefits and my estimates are year-end estimates while the actuaries' estimates are as of the first of the year. With these caveats, my estimates of accrued benefits produce approximations of those made by the Social Security Administration. The estimates here are likely driven by my lower estimates of accrued benefits for individuals who are actually receiving disability benefits.

The decompositions of accrued benefits by sex and by age groups for the years 1985 to 2006 are presented in the two graphs in Figure 3. The left-hand panel indicates that men's accrued benefits grew from $2.0 trillion in 1985 to $8.3 in 2006 and the women's accrued benefits grew from $1.2 to $6.2 trillion over the same time period. Women's share of total accrued Social Security benefits rose from 38% to 43% during this period. My estimates only include benefits accrued based on workers' own earnings records, thus the gains by women are attributable to their increased labor market attachment and rising relative wages and to declining male labor force participation.

[Figure 3 here]

The decomposition by age groups, shown in the right-hand panel indicates that much of the accrued benefits are payable to retirees and near retirees. Individuals 65 and above accounted for 34% of accrued benefits in 1985 and in 2006 they accounted for 29%.[16] The accrued benefits of workers within 10 years of retirement, those 55 to 64 years of age, were equal to 28% of the total in 1985 and this share had risen to 31% by 2006 largely due to the older cohorts of the Baby Boom generation falling in this age group. So, workers and retirees 55 years of age and above accounted for 60% of all accrued Social Security benefits as of 2006. Most of the leading Social Security reform proposals do not affect the benefits expected by these age groups. The likelihood of receipt of these benefits as calculated is high and thus for these households, accrued benefits are comparable to pension wealth in terms of behavioral effects.

The distribution of accrued Social Security benefits within different groups are summarized by the series of Gini coefficients depicted in Figure 4. The Gini coefficients based on the entire distribution of accrued benefits ranged from a high of 0.58 in 1985 to a low of 0.533 in 2000 and stood at 0.54 in 2006. The distribution of benefits among men was more equal than among women in all years due to less dispersion in years of work as well as the taxable maximum that capped many men's wages in the

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[16] As a point of reference, the 2006 FSUG reported that benefits payable to Social Security recipients 62 and above were $5.8 trillion or 33% of the maximum transition cost in that year. My estimates of accrued benefits for workers 65 and above is $4.2.

years prior to the 1983 Social Security reforms. As expected, limiting the sample to individuals 65 and above produces a lower Gini coefficient, but one that rises slightly over time from 0.36 to 0.39 between 1985 and 2006. This reflects the general rise in lifetime wage dispersion, but as important, it also reflects the rise in the taxable maximum which has increased the portion of the wage distribution over which benefits are calculated. The final three series depict the Gini coefficients based on the accrued benefits at retirement for each new group of entrants into Social Security. The series for men shows a gradual increase in inequality, though the Gini coefficient among men indicates that lifetime earnings below the taxable maximum are much less disperse than among women. Again this higher dispersion among women is primarily a consequence of higher variation in lifetime labor force attachment.

[Figure 4 here]

Wealth Estimates

I now turn to estimating how Social Security impacts individuals' total "wealth" position. Deriving estimates of lifetime wealth based on the earnings records in the EPUF first requires imputation of earnings above the taxable maximum as well as estimates of savings rates by family income.

Annual Estimates of Wealth

Here I estimate potential saved wealth based on savings rates by wealth classes available from Saez and Zucman (2014).[17] They report annual savings rates as a percent of primary income by percentiles in the wealth distribution. I match their savings rates to individuals as follows. First, I determine a hypothetical own private wealth amount that represents the necessary accumulated savings in each year, that, when combined with anticipated Social Security benefits, replaces each worker's average earnings. Given that I have an estimate of each individual's Social Security benefits in each year, as described above, I determine Social Security's replacement rate of the worker's annual income up to that year. In the years 1985 an later, I then calculate for each worker the present value of a private annuity that begins at the normal retirement age.[18]

These percentiles are then used to assign a savings rate to the worker in each year based on the savings rates SZ calculated. SZ savings rates are available for wealth percentiles 0 to 90, 90 to 95, 95 to 99, and then above the 99th percentile. While the first range covers 90 percent of households, the

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[17] See Saez and Zucman (2014), Table B33.
[18] For the years prior to 1985 a worker's location in the hypothetical wealth distribution is proxied by cumulative earnings up to the year of the calculation.

average savings rate between 1985 and 2006 was essential zero. Assigning the savings rates by percentile defined separately for men and women assumes the same savings rates by income percentiles. This assignment implicitly assumes that higher income men and women, within the gender categories, are assigned the higher savings rates.[19] Once the savings rates are assigned, annual savings based on the adjusted annual earnings are determined.

Cumulative savings for each individual are calculated in each year 1985 to 2006 using the returns on a standardized portfolio invested in 60% stocks and 40% bonds.[20] This procedure produces annual estimates of savings wealth in each year for each worker and potential retiree. When workers reach the age of 65 their accumulated savings are reduced in each subsequent as was Social Security wealth.

Figure 7 presents the aggregate estimates of savings wealth along with the accrued Social Security benefits for the years 1985 to 2006. By 2006 estimated savings amounted to $23.1 trillion and together with accrued Social Security benefits total combined wealth amounted to $37.6 trillion. The estimated savings wealth accounted for 61% of the total in 2006 and was as high as 70% of the total in 1999. The annual estimates of savings wealth reported here are between 42% and 66% of the total net household wealth reported by SZ and are between 63% and 96% of the equity, bond, and pension wealth they report.[21]

[Figure 7 here]

Though my estimates of savings wealth are lower than SZ's total net wealth, the annual shares of the total savings wealth owned by individuals in the top 10% of the distribution are similar to the share reported by SZ. Figure 8 presents the share of savings wealth, total wealth, and accrued Social Security benefits owned by workers in the top 10% of the savings wealth distribution. The top 10% is defined by the set of workers in the top 10% in the savings wealth distribution for comparability with the estimates by SZ. In 1985, the top 10% owned 63% of the estimated savings wealth and this share grew to 69% by 2006. These estimates are quite similar to the top 10% share reported in Figure 6 of SZ

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[19] Alternatively, the savings rate could be assigned by percentiles in the overall distribution of lifetime earnings. However, this would result in matching the higher savings rates primarily to men.

[20] The total returns on equities, including dividend reinvestment, and the bond returns are from Robert Shiller's webpage http://www.econ.yale.edu/~shiller/data.htm The stock market data are used in Shiller, *Irrational Exuberance*, Princeton University Press, 2000, 2005, 2015, updated. Negative total savings are possible based on negative savings rates. The negative savings are replaced with zero for the purposes of the present calculations.

[21] Saez and Zucman (2014) appendix Table A1.

ranging from 93% of their estimated share in 1999 to 10% of their estimate in 1986. Their estimates of the percentage of total net wealth owned by the top 10% grew from 64% to 71% between 1985 and 2006.

[Figure 8 here]

However, when accrued Social Security benefits are added to savings wealth, the share owned by same top 10% of workers was lower in each year and only grew from 53% to 55% of total wealth between 1985 and 2006. The relative size of accrued Social Security benefits as well as the share of benefits payable to the top 10% account for this reduction. The figure shows that the share of total accrued benefits payable to the top 10% of workers declined slightly from 35% to 33% of total accrued benefits from 1985 to 2006.

Pairing my estimates of accrued Social Security benefits payable to the top 10% of workers with the total net wealth owned by the top 10% from SZ results in higher percentages of total wealth owned by the top 10% that range from 58% in 1985 to 63% in 2006. Social Security wealth's impact on reducing total wealth inequality is less in this case due to SZ's higher net wealth estimates, yet the share of wealth owned by the top 10% is still reduced about 8 percentage points in 2006.

Conclusions

Social Security is an essential component of most workers' retirement plans, comprising a substantial share of the anticipated resources on which they expect to rely as they age. However, Social Security is not included in conventional wealth measures given that workers do not have a legal claim to the receipt of the benefits. The legal claim criteria is appropriate in a strict accounting of wealth. But the discussion of wealth inequality requires the consideration of how the anticipated benefits from Social Security and Medicare impact workers' lifecycle savings decisions, how they are distributed across different wealth categories, and how the distribution of these benefits has changed overtime.

This study addresses how the distribution of Social Security benefits informs the discussion of wealth inequality. I adopt a Social Security wealth measure that is based on workers' accrued benefits based on past participation in the program. This measure is comparable to measures of the accrued pension wealth of defined benefit plans. My estimates of accrued Social Security benefits follows the methodology described for the calculation of Social Security Administration's annual estimates of the maximum transition costs and in aggregate and the estimates are similar in magnitude to those produced by the Social Security Administration.

This exercise revealed that distribution of accrued Social Security benefits has changed over time with women's share of accrued benefits rising from 38% to 43% between 1985 and 2006. This reflects the combination of rising female labor force attachment, rising relative earnings, and the decline in male labor force participation. The share of total accrued benefits payable to retirees fell from 34% to 29% from 1985 to 2006 as a result of the Baby Boom generation's increasing accrued benefits during this period. The overall inequality in the distribution of accrued benefits remained relatively stable even though annual income inequality grew over the reference time period. This stability is a consequence of a consistent benefit formula and the fact that the earnings, on which benefits are calculated, are capped each year at the taxable maximum.

To investigate how accrued Social Security benefits affects measures of wealth inequality, I also estimate lifetime savings wealth by combining savings rates available from SZ with annual earnings estimates that include imputed earnings above the taxable maximum. I estimate that individuals in the top 10% of the wealth distribution held 69% of wealth as of 2006, up from 63% in 1985. Both estimates and the time series are similar SZ's estimates. The same top 10% of individuals in the savings wealth distribution held only 33% of accrued Social Security benefits as of 2006. When accrued Social Security benefits are combined with savings wealth in a total wealth measure, the share of total wealth owned or expected by the top 10% in 2006 is reduced to between 55% and 63%.

These result point to the importance of accrued Social Security wealth in understanding the distribution of total wealth. Accrued benefits are both large in size and they substantially reduce total wealth inequality relative to inequality based on conventional wealth measures. Policy proposals aimed at reducing wealth inequality or at increasing middle class wealth that neglect the role played by elderly entitlement programs in displacing private wealth accumulation or how Social Security and Medicare "wealth" is distributed will miss their intended mark.

Whether accrued Social Security benefits should be included in measures of household's wealth and its dispersion largely depends on how the measures are used and interpreted. Accrued Social Security benefits are not assets in the legal sense, but it is critical that policy interventions recognize the role Social Security has played in producing the evolving wealth distribution.

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Appendix

Life Expectancy Estimates

Recent studies have identified the degree to which life expectancy varies by lifetime income, Waldron(2007), and how the differential mortality affects Social Security's progressivity, Goda et al. (2009). From Figure 1 it is clear that the annual replacement rate is progressive in initial benefits, however, if higher earning workers live longer, the program's progressivity is reduced. I account for differential mortality by estimating the degree to which mortality varies by lifetime income.

The differential mortality rates by income are estimated by comparing the earnings record from another publically available Social Security Administration data set with the earnings record in in the EPUF. This other file, known as the 2004 Benefit and Earnings Public-Use File (BEPUF), is a 1 percent random sample of individuals who were eligible to receive Social Security benefits in 2004. This sample includes 473,366 individuals. All individuals in the BEPUF is file are survivors to 2004 and the BEPUF records annual earnings beginning in 1951 and ending in 2003. Within broad earnings classes, I match the survivors from the BEPUF to similarly defined earnings classes in the EPUF to identify survival rates by income class, year of birth and sex. In the EPUF and BEPUF, earnings records for individuals born between 1920 and 1938 span at least 35 years. For all individuals in the BEPUF born in these years estimate AIMEs, an ordinal indicator of relative lifetime earnings, in the same way I computed the AIMEs for the individuals in the EPUF.

Quartiles based on the AIMEs for the workers in the EPUF are identified within each birth year and by sex. These quartile thresholds are then applied to the AIMEs among the survivors in the BEPUF to identify the share of survivors to 2004 who fall into each of the quartiles.[22] The share of male and female survivors who fall into each quartile of lifetime earnings for workers ages 66 to 84 as of 2004 are identified.[23] This produces quartile in income adjustment factors for ages 22 to 119 that are applied to Social Security Administration male and female cohort level life tables to arrive at differential life expectancies by income quartile.[24]

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[22] Individuals in the EPUF with no earnings are excluded from the base sample as are workers whose AIME at age 65 is less than 25% of the first bend point value.

[23] The trends in the shares by quartile are extended to younger age until they converge. Once they converge the quartiles are assumed to have the same survival rates. The shares by quartiles at ages above 84 are assigned the respective shares at 84.

[24] The life tables by birth cohort and sex were provided by the Social Security Administration. The version of the life tables used here is from 2007.

Figure A-1 presents the survival curves for men and women born in 1925 that are adjusted by the relative survival shares derived as described above. The two graphs show that the survival rates based on own earned income vary more for men than for women based on the evidence from the 1920 to 1938 cohorts from with the relative survival shares are calculated. For example, half of the men born in 1925 (who initially survive to 22) are estimated to die by the ages of 71, 74, 77, 80, in quartiles 1 to 4, respectively. This nine year range among men compare to the two year range among women where half are estimated to die by the ages of 82, 82, 83, and 84 in the respective income quartiles.

From the survival curves for each birth year and sex, I next calculate life expectancies at each age. Figure A-2 depicts the conditional life expectancies by income quartile for men and women born in one of the younger birth cohorts, 1980. As seen in the two graphs, life expectancy at the normal retirement age of 67 varies much less by income than at the younger ages. Men's life expectancy at 67 ranges from 17 to 19 years and women's are essentially the same at about 20 years. In the present study the same income related adjustment factors are used for all birth years, though Waldron (2007) notes that the differential has grown for younger cohorts.

The survival rates and life expectancies are used in conjunction to produce the prospective estimates of accrued Social Security benefits and potential financial wealth in each year between 1985 and 2006. The survival rates are also used to define the workers in the EPUF that I include in the base sample each year. An indicator of survival to each year is assigned to each worker depending on the workers' quartile in lifetime income (defined by the worker's estimated AIME) up to the year of the calculation. If the worker is identified as a survivor, then his or hers estimated accrued benefits and wealth are included for that year.

Annual Earnings Estimates above the Taxable Maximum

The EPUF caps reported earnings at the Social Security taxable maximum. In 1951, when the annual earnings in the EPUF are first available, the cap was $3,600 and by 2006 it was $94,200. The cap was most binding in 1965 when 49% of men who had positive earnings in that year had capped earnings. In that year 13% of women had capped earnings. In 2006, 9% of men and almost 3% of women had capped earnings. Given the degree to which the cap has limited the distribution of reported earnings it is necessary to impute earnings above to cap to arrive at measures of lifetime earnings and potential lifetime savings.

The imputation procedure followed here combines predicted earnings based on data from the EPUF with the actual earnings distribution above the taxable maximum from the Current Population Survey. For each worker in the EPUF, earnings in each year are predicted based on a censored normal regression estimated within age groups by sex.[25] The predicated earnings are then used to assign workers earnings that are obtained from those reported in the Current Population Survey (CPS). The CPS also top codes reported earnings data, but at significantly higher thresholds. The CPS data are available on an annual basis from 1961 to the present. Workers with higher predicted earnings are assigned the higher earnings from the CPS distribution within the age groups for men and women.

Figures A-3 through A-7 in the Appendix illustrate several ways in which earnings inequality has grown over time among men and women. Important to the present analysis is how the evolution of the wage distribution may affect the annual distribution of wealth as it is conventionally measured. Inequality in the distribution of annual wages has definitely grown over time for men and women as illustrated in Figure A-3 and A-4 by the indexed real earnings at the 90th, 50th, and 10th percentiles as well as by the log ratios of the 90th/10th percentiles form men and women depicted in Figure A-5 . However Figures A-6 and A-7 illustrate that, as more years of earnings are averaged, inequality declines relative to the single year measures. Over time, earnings averaged over these longer time periods, in which earnings above a minimum amount are necessary to be included in the average, still indicate increasing inequality. The figures also show that when years of zero earnings are included in the average, the trend toward increasing inequality does not persist. This is illustrated in the top two series in Figures A-6 and A-7. These figures also illustrate that the inequality in average earnings, including the years of zero earnings, is higher among women than among men.

The EPUF data are comparable to the Social Security earnings records used in Kopczuk et. al (2010) in that they are both administrative data from the SSA. Kopczuk, Saez, and Song (2010) estimate annual earnings inequality for men and women using Social Security earnings records from 1937 to 2004. The authors find that from the late 1930s to 1953 inequality fell for all workers and since then it

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[25] The controls in each year include two leads and two lags of earnings as well as a set of dummy variables for each potential combination of no earnings with positive earnings. The censored normal regressions are estimated within age groups separately for men and women. The predicted values above the taxable maximum are ranked and the rank of a worker's predicted earnings are used to assign an imputed value derived from the CPS distribution by age group and sex. The distribution of reported earnings above the taxable maximum from the CPS are similarly ranked such that higher ranked predicted earnings are assigned higher ranked earnings from the CPS. For the years prior to 1961, the average ratios of imputed earnings to the taxable maximum within age groups as of 1961 are used to impute wage to workers with top coded earnings.

has risen. Among men the decline in inequality and subsequent rise is more accentuated than is the time pattern exhibited in the women's earnings distributions. They also find that mobility through the earnings distribution has not overcome increases in annual measures of inequality.

Their data from the Continuous Work History Sample 1951-2004 is also capped at the taxable maximum for the years up to 1978, but after that the earnings data are no longer subject to the top code. Overall, the imputations here produce aggregate results quite similar to those presented in Kopczuk, Saez, and Song (2010). However, given that the CPS also impose a top code, I cannot analyze the extreme upper tail of the distribution as they can in 1978 and later.

Even without estimates of the extreme upper tail of the earnings distribution, the earnings developed here that include the imputed earnings for workers whose earnings are capped, coupled with savings rates available from SZ produce annual estimates of potential saved wealth that have properties similar to the distributions of wealth they report.

Figures

Figure 1. Relationship Between Average Indexed Monthly Earnings (AIME) and Primary Insurance Amount (PIA) for Newly Eligible Retirees in 2014
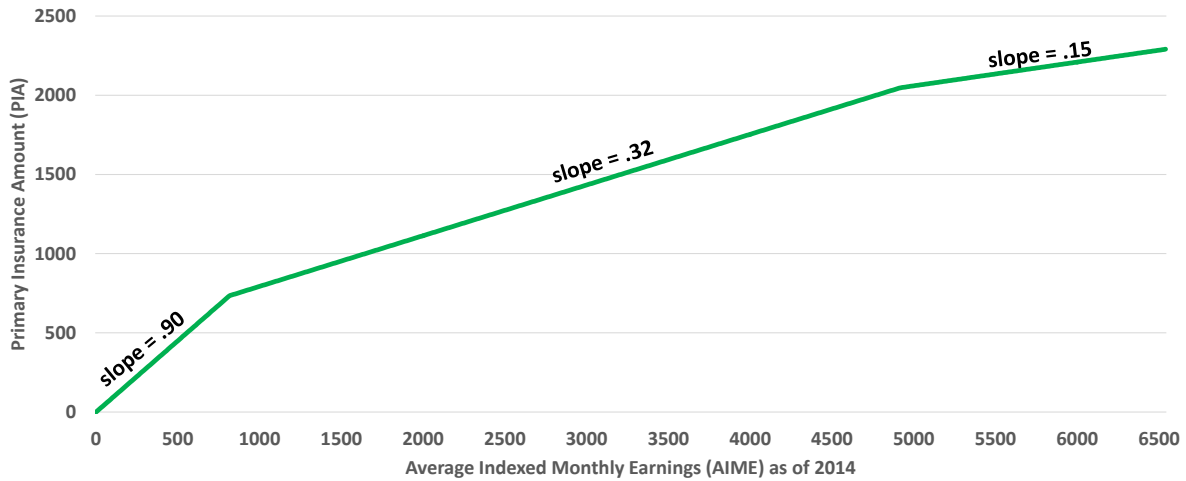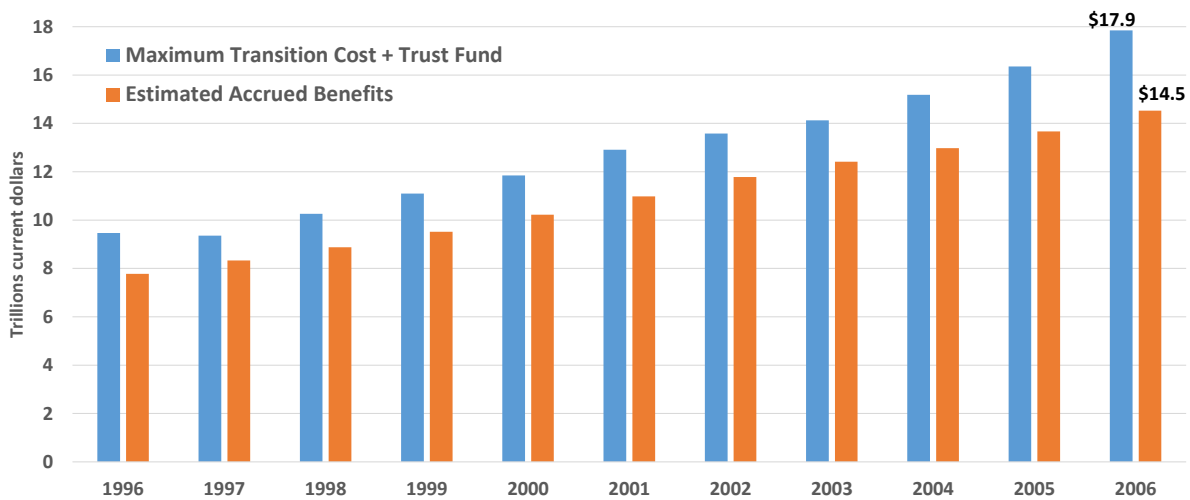

Figure 2. Maximum Transition Costs Compared to Estimated Aggregate Accrued Social Security Benefits

Notes: Maximum Transition Costs from Schultz and Nickerson (2014) Table 3. The Social Security Trust Fund is added to the reported Maximum Transition Cost to arrive at comparable to Estimated Accrued Benefits.

Figure 3. Composition of Accrued Social Security Benefits by Sex and by Age Groups
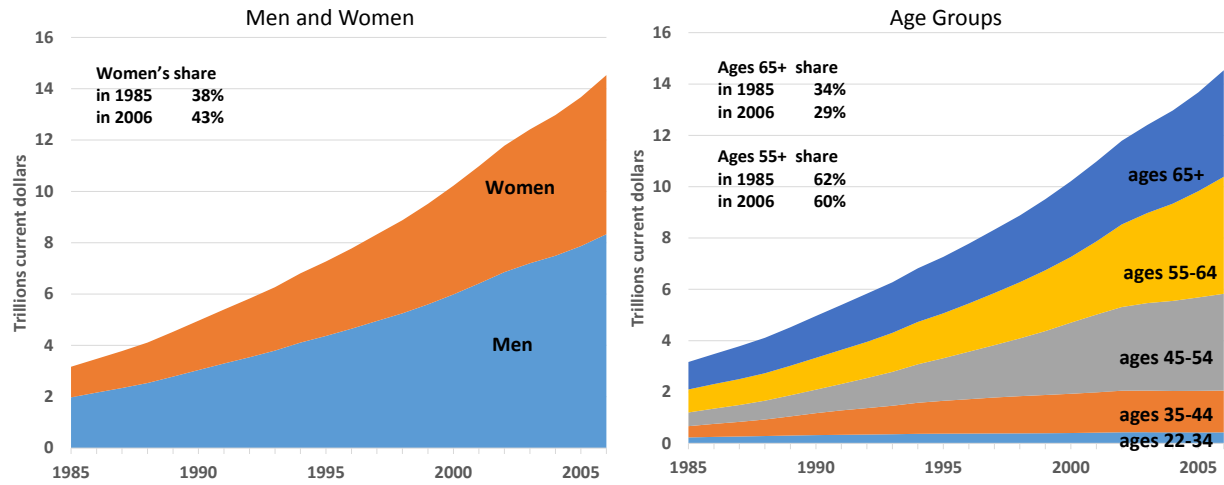

Men and Women

Women's share
in 1985   38%
in 2006   43%

Women

Men

Age Groups

Ages 65+ share
in 1985   34%
in 2006   29%

Ages 55+ share
in 1985   62%
in 2006   60%

ages 65+

ages 55-64

ages 45-54

ages 35-44
ages 22-34

Figure 4. Gini Coefficients Based on Accrued Social Security Benefits by Group

all
0.58

women

men

all
0.54

women age 65

ages 65+
0.36

0.39

all age 65

men age 65
0.21

0.24
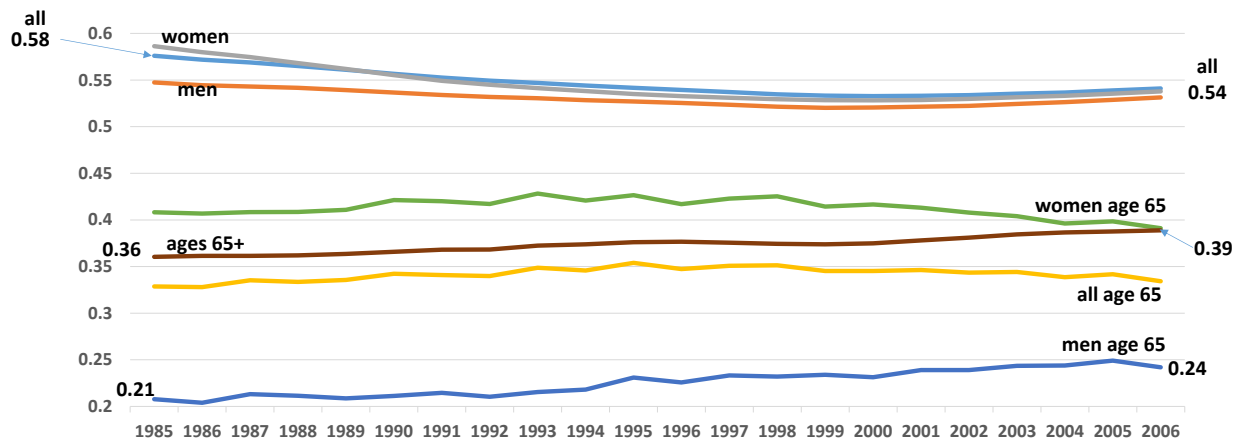
Figure 5. Estimated Savings Wealth and Accrued Social Security

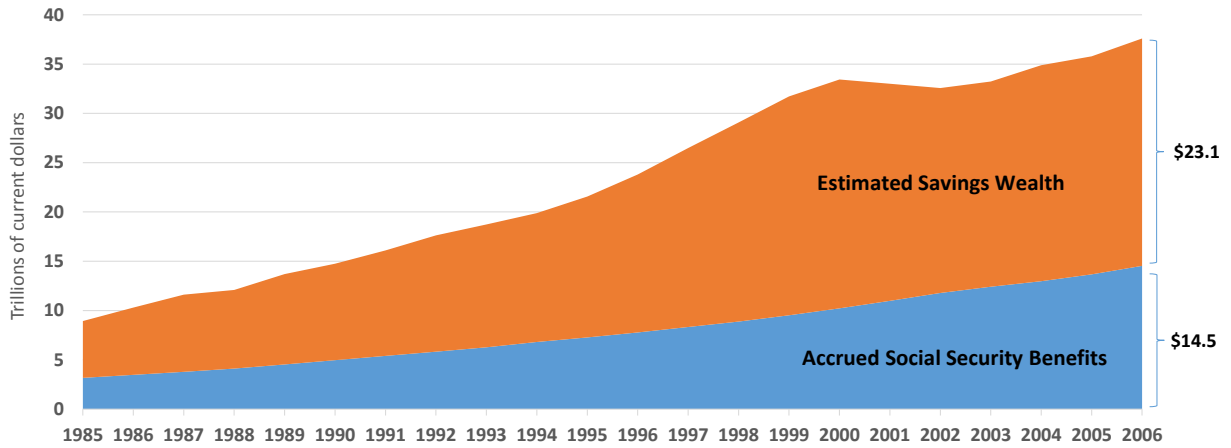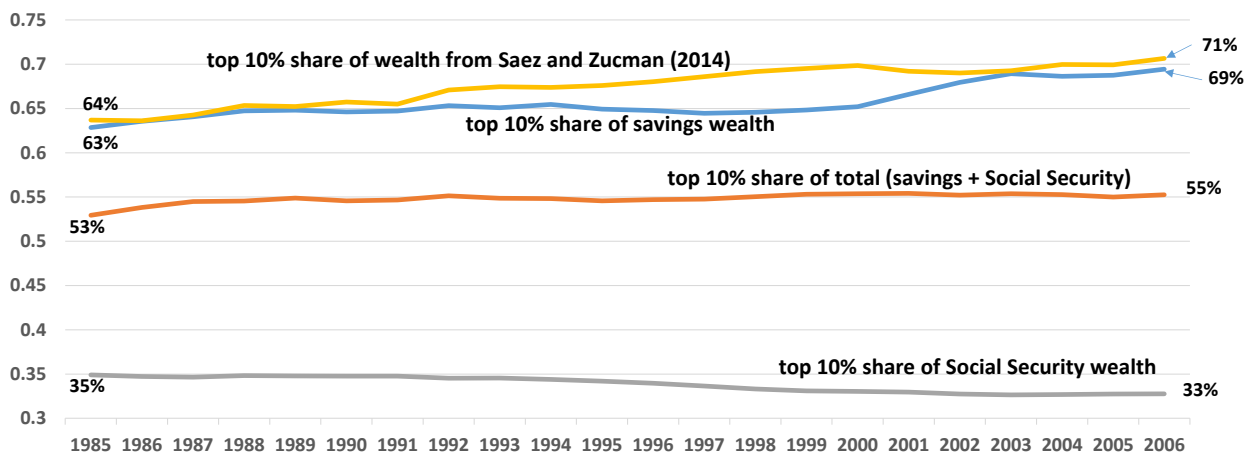## Figure 6. Top 10% Total Wealth, Savings Wealth, and Accrued Social Security Benefits - Top 10% Defined within Savings Wealth Distribution

Figure A-1. Example of Estimated Survival Curves by Income Quartiles, Birth Year 1925
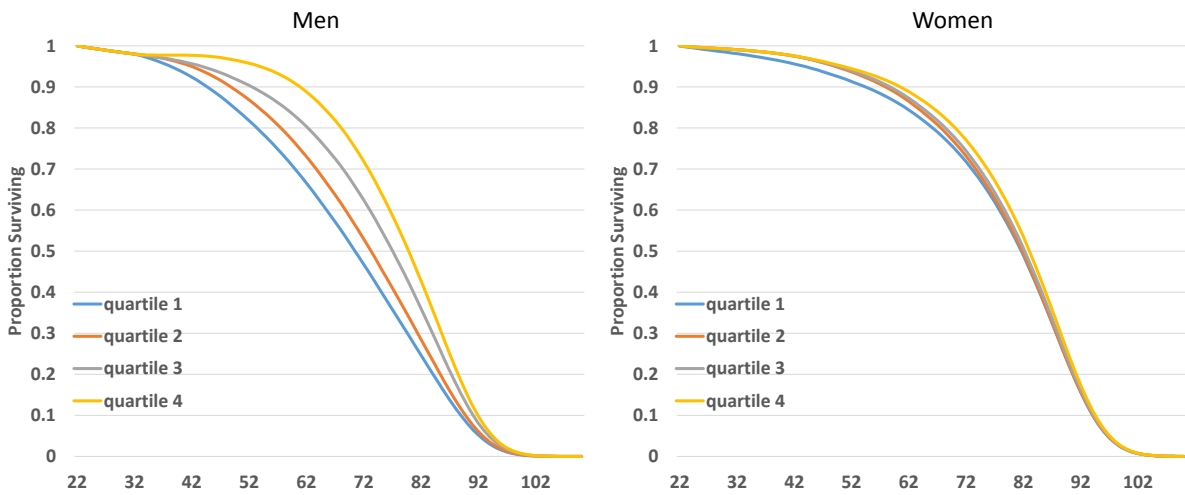

Figure A-2. Estimated Life Expectancy at Each Age by Income Quartiles, Birth Year 1980
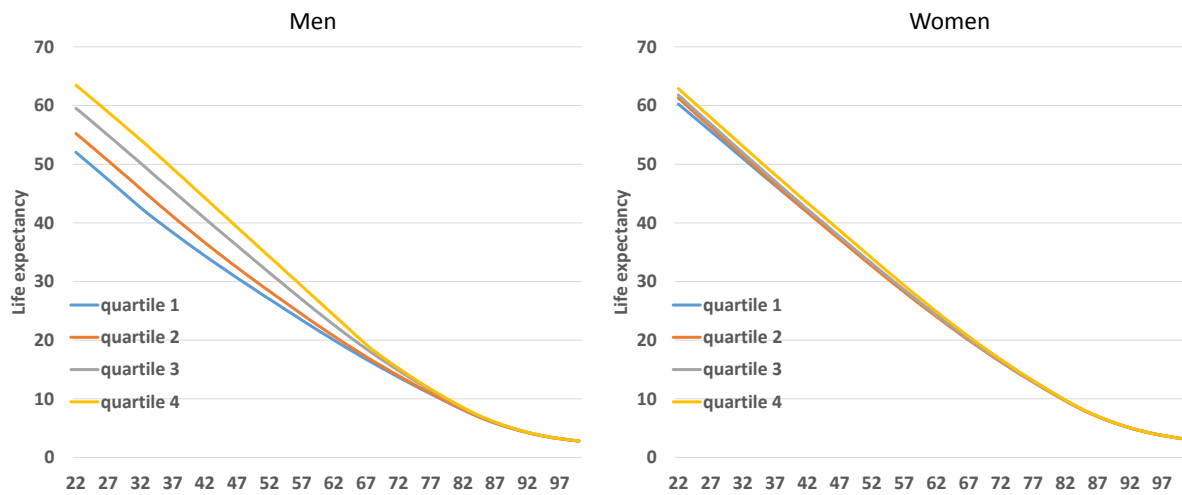
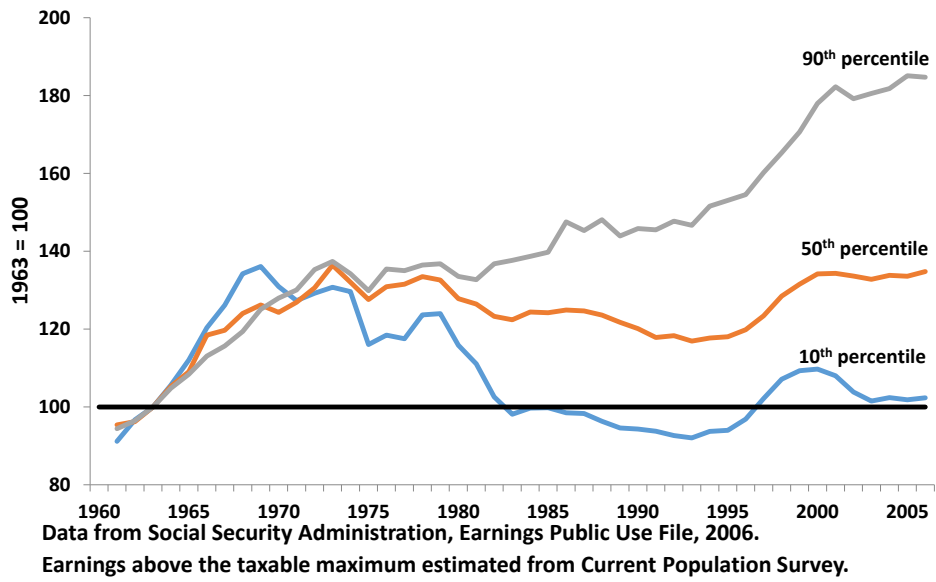## Figure A-3. Annual Real Earnings Indexed to 1963
men ages 25 to 54

90th percentile
50th percentile
10th percentile

1963 = 100

Data from Social Security Administration, Earnings Public Use File, 2006.
Earnings above the taxable maximum estimated from Current Population Survey.

Figure A-4. Annual Real Earnings Indexed to 1963
women ages 25 to 54

90th percentile
50th percentile
10th percentile

1963 = 100

Data from Social Security Administration, Earnings Public Use File, 2006.
Earnings above the taxable maximum estimated from Current Population Survey.

25
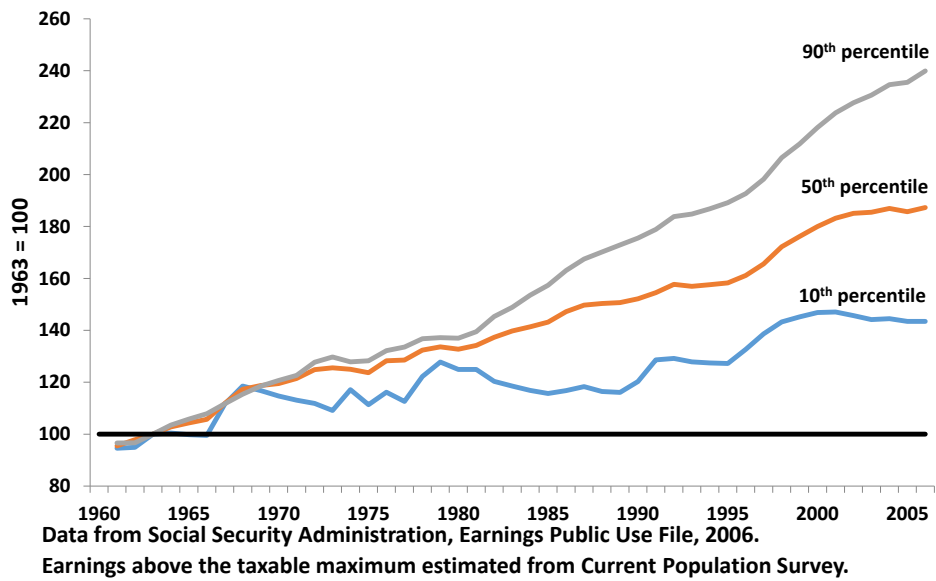
Figure A-5. Annual Earnings Inequality by Percentiles
men and women ages 25 to 54

Data from Social Security Administration, Earnings Public Use File, 2006.
Earnings above the taxable maximum estimated from Current Population Survey.
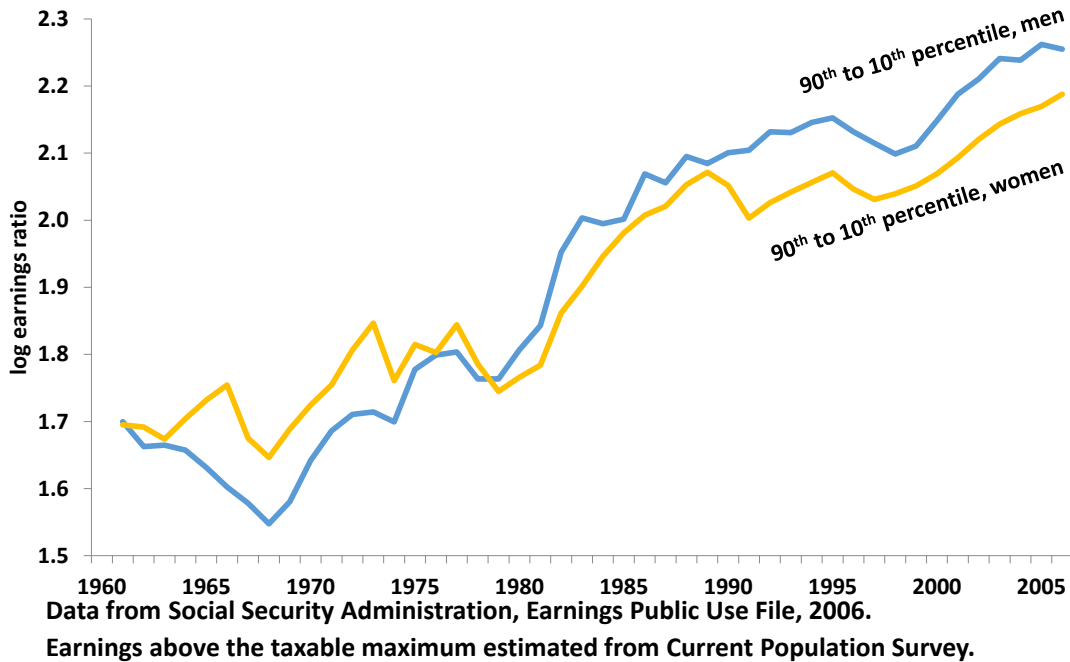
Figure A-6. Log 90/10 Annual Earnings Ratios
men ages 35 to 54

Data from Social Security Administration, Earnings Public Use File, 2006.
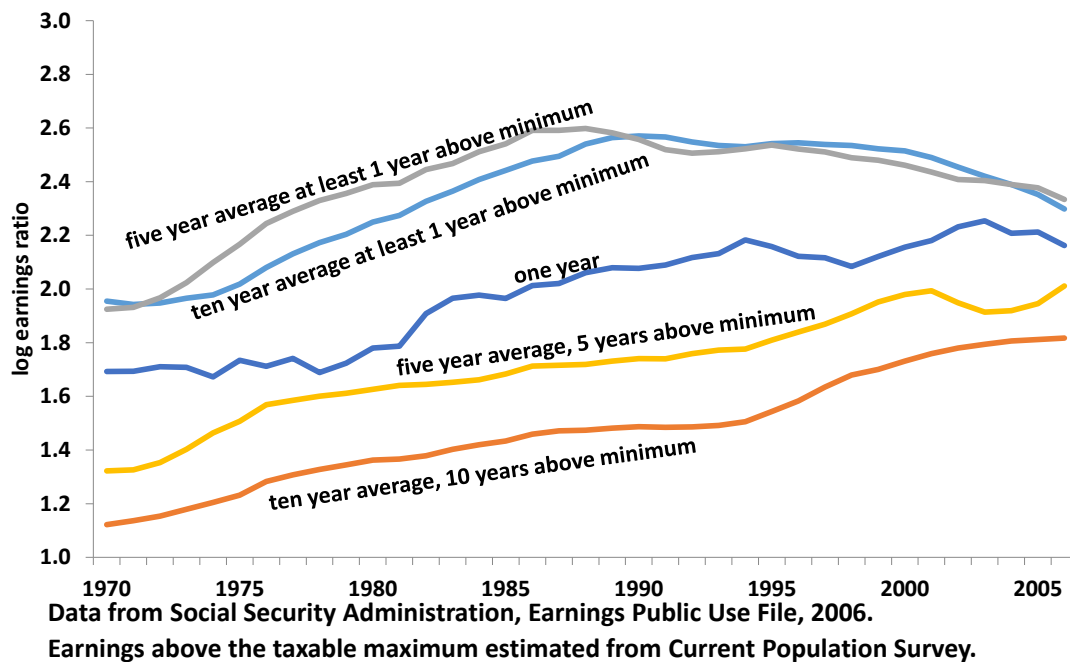**Earnings above the taxable maximum estimated from Current Population Survey.**

Figure A-7: Log 90/10 Annual Earnings Ratios
women ages 35 to 54

Data from Social Security Administration, Earnings Public Use File, 2006.
Earnings above the taxable maximum estimated from Current Population Survey.