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The Effects of Changes in Women's Labor Market Attachment on Redistribution under the Social Security Benefit Formula

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Abstract

Studies conducted in the early 1990s analyzed whether the progressive Social Security benefit formula succeeds in redistributing benefits from high to low earners. These studies suggested that while the benefit formula fostered significant redistribution from individuals with high earnings to those with low earnings, there was much less redistribution of benefits from households with high earnings to households with low earnings. With wives earning much less than their husbands, effectively much of the redistribution was from high earning husbands to their lower earning wives. In addition, spouse and survivor benefits accrued disproportionately to high income households. Both factors mitigated redistribution at the household level.

This paper compares outcomes for the earlier cohort with those of a cohort born twelve years later. We use data from the Health and Retirement Study, hold values in 2004 dollars, and study a population consisting of members of households with at least one person age 51 to 56. There is an obvious decline in the rate of return to Social Security taxes against which other changes are taking place. Comparing the 2004 and 1992 cohorts, over the twelve intervening years, the annual value of covered earnings for men increased from $36,000 to $43,000. The covered earnings of women increased from $13,000 to $22,000. With the greater growth in women's earnings, the Social Security system fostered somewhat more redistribution from high to low earning households.

We use three different measures of redistribution. First, comparing the 1992 and 2004 cohorts, benefits received by members of the highest AIME deciles are reduced by a greater proportional amount in 2004 than they were in 1992. Second, the fraction of total Social Security benefits redistributed from high to low earning individuals increased from 9.5 percent to 11.7 percent. At the household level, the fraction of benefits redistributed from high to low earning households increased from 4.5 percent to 7.4 percent. Nevertheless, a 4.3 percentage point gap remained between the share of benefits redistributed at the individual and household levels. As a third measure, we compute the rate of return to Social Security taxes for members of each AIME decile. These rates of return have declined by roughly equal amounts for members of different AIME deciles. In sum, the 2004 Social Security system, by some measures, was somewhat more effective in redistributing benefits to low AIME households, but was still substantially less

effective in redistributing benefits among households arrayed according to lifetime covered earnings than it was in redistributing benefits among individuals according to own earnings.

The Social Security benefit formula is designed to redistribute old age benefits in favor of ***individuals*** with low lifetime earnings. Studies using data from the early 1990s for individuals approaching retirement age found the Social Security old age and survivors program did meet that goal. However, Social Security was much less successful in redistributing benefits to ***families*** with low lifetime earnings. Three studies (Coronado, Fullerton and Glass, 2000; Gustman and Steinmeier, 2001; Liebman, 2002) conducted at roughly the same time on three different data sets found that, when lifetime benefit payments to households were weighed against taxes paid, there was surprisingly little redistribution fostered by Social Security old age and survivor benefits -- from families with high lifetime earnings to families with low lifetime earnings.[1]

Since 1992, the labor force participation rate and fraction of women working full time has increased. As women's earnings increase, the value of their spouse and survivor benefits decline, and they benefit less from the redistributive structure of the benefit formula. Thus we expect that at the family level, Social Security has become more redistributive over time. The question is, how much more redistributive has it become? This study estimates the change in redistribution fostered by the Social Security benefit formula between two cohorts, those who were 51 to 56 in 1992 and those 51 to 56 in 2004.[2]

Of course, there are other changes affecting the value of benefits and taxes over that twelve year period. Social Security rules have been altered, raising the age at which an individual is entitled to full benefits and thereby effectively reducing the value of Social Security benefits

[1] A study conducted by Harris and Sabelhaus (2005) for the Congressional Budget Office, using a CBO dynamic simulation model (CBOLT), concluded there was a significant amount of redistribution among families with different earnings levels. This conclusion was not strongly influenced by differences in mortality rates by those with different lifetime earnings, and held for the sample of households whether or not it included households where one of the members qualified for disability benefits. Hurd (2011) discusses the differences between the CBO results and those in other studies, including the three noted above, as well as Goda, Shoven and Slalov (2011), which is similar in approach to the three earlier studies. He concludes that there are unexplained differences between these sets of studies and the CBO results.

[2] This is the latest HRS cohort with matched Social Security earnings histories available at the time we are writing this paper. The next youngest HRS cohort, the Mid Boomers, includes those ages 51 to 56 in 2010. Survey data became available in the summer of 2011. Matched Social Security earnings histories are not yet available at the time of writing this paper.

for members of younger cohorts. Moreover, an earnings test is no longer imposed after an individual reaches full retirement age. In addition, economic variables, including interest rates, wages and productivity, have also changed over time. As interest rates decline, the value of benefits relative to taxes paid increases for members of cohorts nearing retirement age. Life expectancy and family structure have also changed, the latter influenced by the increasing frequency of divorce.

It is difficult to standardize for all of these changes while maintaining a convincing underlying benefit structure. One would not, for example, want to impose the benefit formula applicable to a 55 year old in 1992 on the real earnings of a 55 year old in 2004. Under the formula applicable twelve years earlier, a person aged 55 with average earnings in 2004 would be treated as having earnings well above the mean for the earlier period. Although one could artificially grow earnings over the intervening period, it would greatly oversimplify matters to use some average measure of annual earnings growth since the earnings structure has changed over this period, not only changing occupational, educational and other differentials commonly examined in the labor economics literature, but also between men and women, and among those with different family types.

The simplest approach is to focus on the overall extent of redistribution relevant to each cohort, using actual earnings and interest rates for each year in question. Measures of redistribution will then be compared between cohorts both for individuals and families. Sensitivity of the findings to certain changes, for example the increase in frequency of households with a single, divorced person, will be examined. What we are providing are summary measures of the difference in redistribution under the Social Security benefit formula applying in each period, whatever the cause.

Section II sets the stage for the analysis, briefly reviewing how Social Security rules work, and the changes in labor force participation rates of women. In Section III, the basic Social Security measures are computed and compared between the two cohorts and are used to derive the present values of Social Security benefits and taxes paid. Section IV then focuses on the measures of distribution and redistribution fostered by the Social Security system among

individuals and families within each cohort. In Section V we examine the robustness of the findings to changes in divorced households. Section VI concludes.

II. Framing the Problem

The Social Security benefit formula determining an individual's own benefits from that person's own earnings history is designed to be progressive. For example, as we will explain in more detail below, for a person turning age 60 in 2004, on an annual basis the PIA replaces 90 percent of the first $7,344 of average indexed earnings, 32 percent of the next $36,924, and 15 percent of remaining earnings through the covered maximum.

However, the redistributive effects of the formula at the individual level are mitigated at the family level. When wives have lower earnings than their husbands, by averaging over the two spouses, a progressive benefit formula generates less redistribution among families than among individuals.[3] For men, there is a close correlation between their own lifetime earnings and the total of their own and their spouse's lifetime earnings. But for women the relationship is much weaker (Gustman and Steinmeier, 2001, Table 1). Women from high income households are often low earners. Thus when comparing men and women with the same level of own lifetime earnings, family lifetime earnings are higher for women than for men. As a result, redistributing benefits toward households where the woman's earnings are low aids many households where the sum of lifetime earnings for husbands and wives is quite high.

In addition, as long as spouse and survivor benefits accrue disproportionately to households with a single, high earner, the spouse and survivor benefits paid by Social Security will undermine any redistribution of benefits away from high income families. Both spouse and survivor benefits are top ups over own benefits. If the spouse has not accumulated ten years of covered earnings, and thus is not eligible for own benefits, the spouse or survivor benefit will account for the entire benefit check. However, those who are entitled to own benefits, which amount to less than spouse or survivor benefits they are entitled to, are called dual beneficiaries.

[3] When wives from high income families spend less time at work, they receive lower earnings not only because they accumulate fewer hours of paid work, but also because by working fewer hours or years, they are paid a lower wage rate than if they had been fully committed to the labor market.

For dual beneficiaries, those entitled to (lower) benefits based on their own work, spouse or survivor benefits increase the individual's total reward over the amount an individual would be entitled to based on own earnings to a target figure based on the earnings of the highest earning spouse. To the extent that wives from high income households are less regular participants in the labor market, this would increase the importance of top ups to high income households. Indeed, if both spouses have identical earnings histories, the top up for spouse or survivor benefits is worthless.[4] Moreover, in households with high earnings, the top up is likely to have a higher value than in a household with low earnings (Steuerle and Bakija, 1994).

To be sure, there is an increasing tendency over time for women from higher income families to participate more fully in the labor market. This led Smith, Toder and Iams (2003) and others to predict that even if the benefit formula remained unchanged, the current Social Security system would once again become more redistributive at the family level.[5] As seen in Table 1, in the time since these earlier studies, the labor force participation and earnings of women have increased substantially (see also Iams et al., 2008). What was a 19 percentage point gap between the labor force participation rates of 51 to 56 year old men and women in 1992 declined to 8 percentage points in 2004. Similarly, what was a 25 percentage point gap between the fractions of 51 to 56 year old men and women working full time in 1992 declined to 16 percentage points in 2004. Although the gaps are considerably smaller in later years, they remain substantial.

[4] We are ignoring here new claiming strategies for boosting the total value of Social Security benefits through manipulation of the claiming time of own and spouse benefits. For example, with two earners over the full retirement age, one person in the household may first claim benefits as a spouse, then claim own benefits at a higher annual rate because the initial claim date for own benefits has been postponed.

[5] Note that Biggs, Sarney and Tamborini (2009) disagree with the predictions of Smith, Toder and Iams (2003). A part of the disagreement results from the different treatment of those who qualified for disability benefits at younger ages.

Table 1: Labor Force Participation and Full-Time Work Patterns Over Time by Men and Women Ages 51 to 56

	HRS Cohort, 51 to 56 in 1992	Early Boomers, 51 to 56 in 2004
	Labor Force Participation	
All Respondents	73	75
Males	83	79
Females	64	71
	Percent Working Full Time	
All Respondents	64	66
Males	77	74
Females	52	58

III. Comparing Social Security Benefits and Taxes Between Cohorts

Before generating the rates of return to Social Security benefits over taxes, it is useful to discuss in somewhat more detail how Social Security retirement benefits are determined at the individual and family level.[6] Benefits from an individual's own earnings are based on Average Indexed Monthly Earnings (AIME), computed from covered earnings, increased by a wage index up to the year the individual turns age 60. Earnings are no longer indexed once the person reaches age 60. The AIME is averaged using the highest 35 years of covered, indexed earnings. Earnings after age 60 will enter into the AIME calculation if they exceed indexed earnings in the lowest of the 35 years previously counted toward the AIME. From Average Indexed Covered (Monthly) Earnings, the Primary Insurance Amount (PIA) is calculated. The PIA is the monthly Social Security benefit based on own earnings that would be received if claimed by the

[6] This study considers retirement benefits. It does not include disability benefits, survivor benefits for young children or other such benefits provided by the Social Security system.

individual at full retirement age. As noted above, for a person turning age 60 in 2004, on an annual basis the PIA replaces 90 percent of the first $7,344 of annual earnings, 32 percent of the next $36,924, and 15 percent remaining earnings through the covered maximum. Within the same household, the ratio of own benefits to own covered earnings will be greater for a low earning spouse than for a high earnings spouse.

For members of the HRS Early Boomer cohort, ages 51 to 56 in 2004 (born 1948 to 1953), full retirement age is 66. The full retirement age has been increased by 2 months for each year born from 1955 through 1960 -- a fact that becomes relevant when we calculate benefits for households where one member falls within the 51 to 56 age range, and the other is younger. For those born in 1960 or later, the full retirement age is 67. Similarly, the full retirement age may be lower than 66 for those with a spouse born before 1943.

Spouse benefits are calculated as half of the benefits that the primary earner would receive at full retirement age. If the low earning spouse is entitled to own benefits that exceed half the benefits of the high earning spouse, there are no spouse benefits. Spouse benefits are adjusted downward if they are claimed before the lower earning spouse reaches full retirement age.

Survivor benefits are calculated from the full benefit the primary earner would have been entitled to had he or she survived. The formula for calculating full benefits may be adjusted to reduce the number of years of earnings counted if the deceased spouse died before reaching full retirement age. Survivor benefits are adjusted from the deceased spouse's Primary Insurance Amount, upward if the primary earner had delayed claiming benefits after reaching the full retirement age, or downward if the deceased spouse had claimed benefits early. They also are adjusted if the surviving spouse claims them before reaching full retirement age.

A person receiving spouse or survivor benefits is considered a dual beneficiary if that individual is also entitled to benefits based on own earnings that fall below the spouse or survivor benefit. Benefits based on own earnings are "topped up" to reach the benefit the individual is entitled to as a spouse or survivor. For example, if both spouses were the same age and retired at their full retirement age, with the high earning spouse entitled to a PIA of $900, and the low earning spouse entitled to $100 based on own earnings, the spouse benefit would top

up the benefit of the low earner from $100 to $450. If the higher earner died at full retirement age, the lower earning spouse would receive a total survivor benefit of $900, including the top up.

In the course of this paper, we use the Social Security Administration's ANYPIA program to calculate own benefits for members of the Health and Retirement Study.[7] Because the ANYPIA program does not calculate spouse and survivor benefits, we calculate spouse and survivor benefits from the own benefit calculations for each spouse. The ANYPIA program requires information on the date of birth of each spouse, covered earnings history, and the expected date at which benefits will be claimed. We provide the required information from the HRS survey and feed it into ANYPIA program in batch mode. In the course of projecting benefits, ANYPIA uses the information from the HRS data to project earnings into the future, and to calculate the Primary Insurance Amount based on that information.

Table 2A reports the value of covered income and benefits of different types for individuals from the Early Boomer cohort of the Health and Retirement Study, those 51 to 56 in 2004. Social Security earnings records are available for about three fourths of the respondents to the HRS from Early Boomer households. Benefits and taxes are imputed for those in the cohort without a matched record.

Column 1 reports the annual average for indexed earnings (AIME*12). Annual benefit amounts based on the individual's own work are reported in column 2 assuming retirement at the individual's expected retirement age. (Findings assuming retirement at the individual's full retirement age are similar throughout.) The present value of own benefits is reported in column 3. The remaining columns in Table 2A report different measures of benefits for members of their households. The rows in Table 2A first report results for all respondents, and then separately for men by marital status, and then for women by marital status.

Looking across row 1, annual indexed earnings average $33,048 for each respondent, with the yearly value of AIME $42,881 for men and $21,676 for women. Roughly speaking,

[7] In some cases, ANYPIA makes different assumptions from those we made in our earlier paper. For example, in our earlier study, we rounded the full retirement age to the nearest year, whereas ANYPIA keeps track of the full retirement age to the month.

covered earnings for women are half those for men (the ratio of AIME of women to men is .505). Moreover, the gap is even wider within married households. Annualized AIME for married men is $46,433, while for married women it is $21,615, so that married women have 46.6 percent of the covered earnings of married men. The Primary Insurance Amount (PIA) multiplied by 12, $16,790, is reported in column 2 under the assumption of retirement at expected age of benefit claiming.

Column 3 shows the present value of benefits based only on own work, with benefits beginning at the age the respondent expects to claim them. Annual benefits are discounted to 2004, using the interest rate observed through 2010 and as projected thereafter by the Social Security actuaries, and weighted by survival probabilities using a life table adjusted for variation in life expectancy with income and education. For individuals from households with at least one member age 51 to 56 in 2004, that present value is $135,358. At $119,865, the present value of benefits women will receive based on own earnings is 80.6 percent of the present value men will receive based on own earnings ($148,753). With women enjoying four fifths of the benefits from own earnings as men, women clearly benefit considerably from the redistributional benefit formula since, as noted above, women had about half the covered earnings of men.

For married men benefits are worth $157,770. Benefits for divorced, widowered or never married men fall below those values. Divorced women living alone have benefits based on own work that are about 8.4 percent more valuable than the benefits earned by married women, and about one quarter more valuable than the benefits based on own earnings received by widows.

Columns 4, 5 and 6 credit the spouse who is the primary earner with any spouse and survivor benefits that will be paid as a result of the primary earner's covered income. Columns 4 and 5 report the values of the top ups in benefits for qualifying spouses and for widowers or widows of primary earners, all adjusted by the probability the individual will fall into that state.[8] Spouse and survivor benefits paid to the wives and widows of primary male earners respectively

[8] Since we begin the calculation of survival probabilities at age 21, Table 2A and subsequent tables include imputations for taxes paid by deceased spouses. Divorced spouses are also imputed. However, their benefits and taxes paid are not counted in the population totals since their spouse is presumably included in the divorced or married (for a second time) population of the other gender. Nevertheless, the benefits of the missing divorced spouse must be imputed to calculate the spouse or survivor benefits of the divorced person who is included in the sample.

are seen in column 4, row 2, to be worth $11,472 and $45,066, raising the total value of benefits earned by men from their work from $148,753, the amount they would be entitled to based on own earnings, to $205,291, or by about 38 percent.[9] Total benefits reported in column 6, amounting to $167,636, include own benefits plus any spouse or survivor benefits due to own earnings.

Comparing the values in columns 4 and 5, rows 2 and 7, it can be seen that the spouse and survivor benefits generated by women's earnings are only a small fraction of the spouse and survivor benefits due to the earnings of men. The basic reason, of course, is that with most men having higher earnings than their wives, they are not entitled to any spouse or survivor benefits. On the other hand, wives with significant commitment to the labor market are entitled to a top up as long as their covered earnings fall below those of their husbands. Moreover, with the significant degree of nonparticipation by wives shown in Table 1, adjustments for the timing of retirement aside, wives who are not eligible for own benefits are nevertheless eligible for half the benefits earned by their husband while both are still alive, and to their husband's full benefits should he die.

Columns 7, 8 and 9 report each individual's own earnings, plus spouse and survivor benefits paid to the individual based on their spouse's earnings. Here the spouses that receives the check from SSA is credited with spouse and survivor benefits even though their husbands or wives accounted for the earnings and paid the taxes that underlie their benefits. In contrast to the results in columns 4 and 5, here men are credited with very little in the way of spouse and survivor benefits. Specifically, as seen in row 2, columns 7, 8 and 9, for men the top up to own benefits from spouse benefits is $1,015, while the expected value of survivor benefits is $2,672. Together the spouse and survivor benefits received by men are worth only about 2.5 percent of the present value of the benefits they receive due to the their own covered work.

Table 2B presents indicators of annual earnings and benefits for members of HRS households with at least one person aged 51 to 56 in 1992. To facilitate a comparison with the earlier table, the dollar amounts in Table 2B are reported in 2004 dollars.

[9] Ninety two out of 1,344 married men have a positive spouse benefit. Average spouse benefit for this group is $16,522. Out of 1,345 married women, 579 have a positive spouse benefit. Average spouse benefit for this group is $30,302.

At $23,626, annual indexed covered earnings for the 1992 cohort are about 71 percent of the $33,048 value reported for the 2004 cohort. A number of factors account for these differences. Among them are differences in real earnings and the lower cap on covered earnings for members of the 1992 cohort (Gustman, Steinmeier and Tabatabai, 2010). While earnings of women were about half the earnings of men in the 2004 cohort, AIME for the 1992 cohort is $35,881 for men and $12,608 for women, so that women from the 1992 cohort earned only about 35 percent of the covered earnings of men.[10] Within married households, the gap in earnings between men and women was considerably wider for the 1992 cohort, with married women earning only 31 percent of the covered earnings of married men. This compares to a ratio of 46.6 percent between earnings of married women and married men from the 2004 cohort.

For the 2004 cohort, we noted that based on own earnings, the present value of benefits received by women amounts to about four fifths of the present value of benefits men receive based on own earnings. For the 1992 cohort, the relevant amounts for women and men, again in 2004 dollars, were $74,135 and $132,066. Thus the 1992 cohort of women enjoyed only 56 percent of the benefits from own earnings as men. Again, the major growth in women's earnings is plainly evident in the data, even between cohorts separated by only 12 years of age.

In addition, for the 2004 cohort, we found that spouse and survivor benefits paid to the wives and widows of primary male earners increased the total value of benefits earned by men from the amount they would be entitled to based on own earnings by about 37 percent (11,472+43,809)/148,753. For the cohort of 1992, spouse and survivor benefits were more important, raising the total value of benefits by 46.5 percent (15,201+46,148)/132,066.

It is also constructive to compare the relative importance of spouse and survivor benefits to own benefits for women. From Table 2B, using data for the 1992 cohort, columns 7, 8 and 9,

[10] In 2004, 60.0 percent (weighted) of women living in a household with at least one person age 51 to 56 were married. In 1992, 70.4 percent of women were married. Most of the difference is accounted for by divorces. In 2004, 28.3 percent of women in this age range lived in a single person household and were divorced. The comparable number in 1992 is 16.4 percent. With fewer women in married households in 2004, the distribution of benefits across households is more unequal. This change in household structure is another reason for the observed differences between the two cohorts. We explore the sensitivity of the findings to the change in weight for divorced households below.

row 7, spouse and survivor benefits accounted for 68.6 percent of the total benefits women would receive from own earnings (12,468+38,398)/74,135. For the 2004 cohort, spouse and survivor benefits accounted for 40.2 percent of the benefits eventually to be received by women (9,585+38,632)/119,865.

Table 2A: Covered Earnings and Benefits Earned By Members of HRS Households 2004 (in 2004 dollars)

	Own Benefits			Generated by Own Earnings			Generated by Own & Spouse's Earnings			Nu
	AIME *12	Annual Value of PIA at Age Respondent Expects to Claim SS Benefits	Present Value of Own Benefits	Spou Bene Aver Valu Top Indic Popu	Surv Bene Aver Valu Top Indic Popu	Tota Bene Own Spou Surv Bene	Spou Bene Aver Valu Top Indic Pop	Surv Bene Aver Valu Top Indic Popu	Tota Bene Own Spou Surv Bene	of Ob
	1	2	3	4	5	6	7	8	9	10
VALUES FOR INDIVIDUAL RESPONDENTS										
All Rs	33,048	16,790	135,358	6,600	24,789	166,747	4,989	19,345	159,692	3,764
All Males	42,881	20,272	148,753	11,472	43,809	204,034	1,015	2,672	152,440	1,791
Married Males	46,433	21,334	157,770	13,921	53,210	224,901	1,074	2,971	161,815	1,344
Divorced Males Living Alone	37,378	19,061	134,159	6,832	25,881	166,872	1,353	2,860	138,372	244

Widowered Males	22,927	14,089	110,586	NA	NA	110,586	NA	NA	110,586	113
Never Married Males	25,065	13,912	97,273	NA	NA	97,273	NA	NA	97,273	90
All Females	21,676	12,764	119,865	967	2,792	123,624	9,585	38,632	168,082	1973
Married Females	21,615	12,509	117,384	1,353	3,472	122,209	12,342	48,661	178,387	1345
Divorced Females Living Alone	22,768	13,477	127,262	451	2,437	130,150	7,211	32,000	166,473	406
Widowed Females	16,202	10,857	101,569	NA	NA	101,569	NA	NA	101,569	124
Never Married Females	25,009	15,224	141,456	NA	NA	141,456	NA	NA	141,456	98

Sample includes members of households where at least one individual is 51 to 56 in 2004. All values use survey weights.

* Spouse and survivor benefits attributed to individuals whose earnings generated the benefits. Total benefits (column 6) = column 3 + column 4 + column 5.

** Spouse and survivor benefits are generated based on individual's spouse's earnings. Total benefits (column 9) = column 3 + column 7 + column 8.

Table 2B: Covered Earnings and Benefits Earned By Members of HRS Households 1992 (2004 dollars)

	Own Benefits			Generated by Own Earnings			Generated by Spouse's Earnings			
				Spou	Surv	Tota	Spou	Surv	Tota	Nu

	AIME *12	Annual Value of PIA at Age Respondent Expects to Claim SS Benefits	Present Value of Own Benefits	Bene Aver Valu Top Indic Popu	Bene Aver Valu Top Indic Popu	Bene Own Spou Surv Bene	Bene Aver Valu Top Indic Pop	Bene Aver Valu Top Indic Popu	Bene Own Spou Surv Bene	of Ob
	1	2	3	4	5	6	7	8	9	10
VALUES FOR INDIVIDUAL RESPONDENTS										
All Rs	23,626	12,986	10 1,563	6,774	20,648	12 8,985	7,348	22,343	13 1,254	1 2,314
All Males	35,881	18,210	13 2,066	15,201	46,148	19 3,415	442	907	13 3,414	5 653
Married Males	37,240	18,808	13 7,470	18,654	56,457	21 2,580	546	1,088	13 9,104	4 769
Divorced Males Living Alone	32,291	16,505	11 5,433	1,490	5,581	12 2,505	13	171	11 5,617	5 96
Widowered Males	29,134	15,445	10 9,706	NA	NA	10 9,706	NA	NA	10 9,706	9 2
Never Married Males	24,664	13,565	92,772	NA	NA	92,772	NA	NA	92,772	1 96
All Females	12,608	8,288	74,135	286	938	75,359	12,468	38,398	12 5,001	6 661

Married Females	11,586	7,686	68,821	404	1,284	70,510	17,589	54,135	140,546	4,889
Divorced Females Living Alone	15,032	10,152	90,169	4	206	90,379	260	1,208	91,637	977
Widowed Females	12,060	8,143	72,769	NA	NA	72,769	NA	NA	72,769	565
Never Married Females	23,739	12,223	11 1,058	NA	NA	11 1,058	NA	NA	11 1,058	230

Sample includes household members where at least one individual is 51 to 56 in 1992. All values are reported in 2004 dollars and are calculated using survey weights.

* Spouse and survivor benefits attributed to individuals whose earnings generated the benefits. Total benefits (column 6) = column 3 + column 4 + column 5.

** Spouse and survivor benefits are generated based on individuals' spouse's earnings. Total benefits (column 9) = column 3 + column 7 + column 8.

In contrast to the results for individuals reported in Tables 2A and 2B, Table 3 reports benefit values for *households* with at least one member age 51 to 56. The two rows compare outcomes between the 2004 and 1992 cohorts evaluated in 2004 dollars. Household benefits count the total of benefits received, from own earnings and from spouse and survivor benefits.

As seen in the last column of row 1, in 2004 the present value of total benefits in each household averaged $271,093. Benefits from own earnings amounted to $220,040, with a top up for spouse benefits of $10,473, and for survivor benefits of $40,526. Thus benefits from own earnings account for over four fifths of benefits (81.2 percent), while the top up for spouse and survivor benefits accounts for a little under one fifth (18.8 percent) of benefits.

Row 2 reports comparable figures for those ages 51 to 56 in 1992. To facilitate comparisons, present values are calculated in constant 2004 dollars. In 1992, 23.0 percent of total benefits were in the form of spouse and survivor benefits ($11,560+ $36,574)/$208,890. Thus with the increase in women's labor force participation and earnings, the share of total benefits enjoyed by households from spouse and survivor benefits fell from 23.0 percent in 1992 to 18.8 percent of total benefits between 1992 and 2004.

Table 3: Covered Earnings and Benefits for Members of HRS Households with at Least One Individual Age 51 to 56 in 2004 and 1992

	Own Benefits			Spouse Benefits	Survivor Benefits	Total Benefit
	AIME *12	PIA at Age Respondent Expects to Claim SS Benefits	Present Value of Own Benefits	Average Value of Top Up for Indicated Population	Average Value of Top Up for Indicated Population	
VALUES FOR HOUSEHOLD						
All Households 2004	56,396	30,073	220,040	10,473	40,526	271,093
All Households 1992 in 2004 dollars	37,498	20,776	160,756	11,560	36,574	208,890

The number of households in the 2004 sample is 2,287. In the 1992 sample there are 7,611 households. Values are calculated using survey weights.

Table 4 provides a picture of the trends in benefits and taxes at the individual and family levels.[11] As seen in rows 1 and 2 of column 2, for members of the 1992 HRS cohort, the present values of benefits and taxes based on own earnings were roughly equal at $106,000 and $102,000 respectively. By 2004, benefits based on own work amounted to only 81 percent of taxes paid. This decline in the returns to Social Security taxes reflects the changes in the benefit structure implemented to help solve the financial problems of the Social Security system, and shows itself in one form or another in all comparisons between the two cohorts.

It is constructive to consider the changes for men and women separately. Real taxes increased by 37 percent for men, but reflecting the major changes in their lifetime participation and resulting earnings, taxes increased by 86 percent for women. Own benefits increased by only 12.6 percent for men (132,066/148,753). On the other hand, for women, own benefits grew by 61.7 percent, reflecting the overwhelming trend in their participation and resulting positive effects on earnings.

As found in the data for own benefits and taxes, benefits grew more slowly than taxes at the household level. The last column in the bottom panel of Table 4 shows that household Social Security benefits rose by 30 percent between the 2004 and 1992 cohorts, while taxes paid at the household level rose by 53 percent. (This result is partially affected by the change in the composition of households between 1992 and 2004, an issue we will return to below.) In 2004 at the household level, the present value of Social Security benefits, at $271,000, slightly exceeded the present value of taxes paid, at $260,000, by four percent. In contrast, as seen in the last row in column 2, in 1992, the initial year of the HRS, total benefits at the household level exceeded taxes by about 23 percent. As a result of the slower relative growth of benefits, by 2004 the benefit-tax ratio had fallen by 19 percent from its level in 1992.

[11] In calculating the tax rate, we include both the employer's and the worker's share of the tax. Because this study focuses only on retirement benefits, the payroll tax rate we use does not include the taxes that support disability benefits or Medicare benefits. For example, the relevant payroll tax rate after 2000 is 10.6 percent.

Table 4: Present Values of Social Security Benefits and Taxes for Individuals and Households, from Households with at Least One Person Age 51 to 56 in the 2004 or 1992. (All Values in Thousands of 2004 Dollars)

	2004 Cohort	1992 Cohort	Ratio 2004 Cohort to 1992 Cohort
Own Benefits and Taxes			
All			
Average lifetime taxes	166	106	1.57
Average lifetime benefits	135	102	1.32
Benefits/Taxes	.81	.96	.84
Men			
Average lifetime taxes	215	157	1.37
Average lifetime benefits	149	132	1.13
Benefits/Taxes	.69	.84	.82
Women			
Average lifetime taxes	110	59	1.86
Average lifetime benefits	120	74	1.62
Benefits/Taxes	1.09	1.25	.87

Household Benefits and Taxes			
Average lifetime taxes	260	170	1.53
Average lifetime benefits	271	209	1.30
Benefits/Taxes	1.04	1.23	.85

Values are calculated using survey weights.

IV. Comparing Measures of Distribution and Redistribution Between Cohorts

A. Distribution and Redistribution of Own Benefits and Taxes

Table 5 reports a variety of measures of benefit and tax distribution and redistribution for the Early Boomer Cohort in 2004, members of households with at least one person age 51 to 56 in 2004. The population is divided into deciles according to the Average Indexed Monthly Earnings covered under Social Security and outcomes are reported separately by AIME decile. The first two rows report the present values of taxes and benefits as of 2004. These are calculated using the ten year bond rate as the interest rate through 2010, and using the intermediate interest rate projection from the Social Security Administration for future years after 2010. Values are weighted by survival probability, which includes adjustments for income. The present values of taxes and benefits for the full sample of Early Boomers is reported in the last column of the table. The ratio of the present value of benefits to taxes is .81 (135/166).

The first set of measures of redistribution involves a simple comparison of benefits and taxes for members of each AIME decile. In this comparison, benefits include only those due to own earnings. Although there are positive benefits shown for members falling within the decile with the lowest ten percent of covered earnings, there is no redistribution to individuals falling in that decile in the sense that their benefits fall below taxes paid. Many falling into the bottom AIME decile have not worked for the required ten years and thus do not qualify for and Social Security benefits. Benefits do exceed taxes for those falling in the second to fifth AIME deciles, then fall below taxes for those in the remaining deciles. For those in the second, third and fourth deciles, there is significant redistribution. Own benefits exceed own taxes by 53 percent, 59 percent and 23 percent respectively.

The next row reports a measure of redistribution that reflects the increase in benefits due to the redistributive effects of the benefit formula. The baseline is taken as the level of benefits that would be received by members of the decile based on own earnings if their benefits amounted to 81 percent of the taxes they paid, the average ratio for the Early Boomer Cohort. That is, the baseline asks what benefits would be if the benefit-tax ratio for members of the decile were the same as the benefit-tax ratio for all members of the Early Boomer cohort. For example, from column 3, row 3 of the table, members of the third AIME decile receive benefits

that are 84 percent higher than they would be if their benefits amounted to 81 percent of the taxes they paid. Moving across the columns in row 3, those in the second to seventh deciles of AIME receive benefits that exceed what they would have received at 81 percent of the taxes they paid. Those in the last three deciles have had their benefits reduced by the progressive benefit formula. Members of the decile with highest AIME have their benefits reduced by 32 percent below what they would have been with an 81 percent replacement rate.

Another measure of redistribution asks about the share of total benefits paid to members of the cohort that is redistributed to the members of each decile. Specifically, the figures in row 4 divide the benefits redistributed to the decile by the total value of benefits paid to members of the Early Boomer cohort. Altogether, 11.39 percent of total benefits paid (-1.51 -3.50 -6.38) are redistributed from members of the three highest AIME deciles to the remainder of the population. Those falling in the lowest decile also receive benefits that fall slightly below the taxes they paid, with the shortfall amounting to 0.3 percent of total benefits paid to members of the cohort.

Table 5: Baseline Measures of Distribution and Redistribution of Own Social Security Benefits and Taxes for All Age Eligible* Respondents in the Early Boomer Cohort, 2004

	Annualized individual AIME deciles: 2004 (2004 dollars)										
	0 -4 K	4 -9	9 -14	1 4-20	2 0-27	2 7-35	3 5-44	4 4-57	5 7-73	7 3+	A ll
Average lifetime taxes	$ 10 K	3 4	5 9	9 1	1 24	1 63	2 04	2 58	3 24	3 99	1 66
Average lifetime benefits	7	5 2	9 4	1 12	1 31	1 49	1 77	1 96	2 12	2 25	1 35
Measure of redistribution % by which benefits are increased	- 34%	7 7	8 4	4 6	2 2	1 0	0 .8	- 9	- 20	- 32	-
Share of total benefits redistributed to the decile	- 0.30%	2 .06	3 .42	3 .01	1 .96	1 .13	0 .11	- 1.51	- 3.50	- 6.38	1 1.68
Rate of return percentiles											
90%	1 .5	5 .3	5 .0	4 .4	4 .2	3 .6	3 .3	2 .7	2 .2	1 .5	4 .5
75%		5 .0	4 .6	3 .8	3 .5	3 .0	2 .6	2 .3	1 .6	0 .8	3 .2
50%		4 .4	4 .2	3 .1	2 .8	2 .4	2 .0	1 .5	0 .8	0 .1	1 .8
25%		2 .8	3 .1	2 .2	1 .9	1 .5	1 .3	0 .7	0 .1	- 0.6	0 .1

10%			2 .2	1 .3	1 .2	0 .8	0 .4	. 04	- 0.5	- 0.9	-

*Age eligible respondents in 2004 include all respondents who either themselves or their spouse were between 51 to 56 years of age in 2004. Public employees and their spouse are excluded.

The bottom panel of the table reports real rates of return by AIME decile. Looking at the last column, row 3 of the bottom panel, the median value for the real rate of return is 1.8 percentage points. It would appear both from the declining amount of redistribution as AIME increases across rows 3 and 4 of the top panel of Table 3A, and from the rapid decline in rate of return with AIME, that there is considerable redistribution fostered by the progressive benefit formula, at least when evaluated only considering own benefits and taxes at the level of the individual.

Table 6 reports comparable results based on the distribution of own taxes and benefits for members of the original HRS cohort, those ages 51 to 56 in 1992. Beginning with the simple comparison in rows 1 and 2 of benefits and taxes for members of each AIME decile, benefits substantially exceed taxes for those falling in the third to sixth AIME deciles, so that in 1992, redistribution extends to members with higher relative incomes than in 2004. Benefits and taxes are roughly equal for members of the seventh AIME decile. For the 2004 cohort, those in the second, third and fourth deciles had own benefits exceed own taxes by 53 percent, 59 percent and 23 percent respectively. For the 1992 cohort, benefits exceeded taxes by 71 percent (48/28), 65 percent (79/48), 32 percent (98/74) and 15 percent (117/102) for members of the third, fourth, fifth and sixth AIME deciles respectively. While these raw numbers suggest there may have been more redistribution in 1992 than in 2004, the benefit reduction for members of the top three AIME categories suggests otherwise. Looking at the last column of row 4 in Tables 5 and 6, in 2004 11.68 percent of total benefits paid to the cohort was redistributed from members of the three highest earning deciles. This is a greater amount of redistribution than in 1992, when 9.53 percent of total benefits paid was redistributed from members of the top AIME deciles.

Table 6: Baseline Measures of Distribution and Redistribution of Own Social Security Benefits and Taxes for All Age Eligible* Respondents in the HRS, 1992

	Annualized individual AIME deciles: 1992 (2004 dollars)										
	0 -1 K	1 -4	4 -8	8 -13	1 3-19	1 9-27	2 7-35	3 5-44	4 4-52	5 2+	A ll
Average lifetime taxes	2	1 3	2 8	4 8	7 4	1 02	1 38	1 75	2 17	2 57	1 04
Average lifetime benefits	0	1 1	4 8	7 9	9 8	1 17	1 39	1 51	1 76	1 96	1 02
Measure of redistribution % by which benefits are increased	- 98	- 19	6 8	6 4	3 4	1 5	0 .4	- 11	- 16	- 20	- -
Share of total benefits redistributed to the decile	- 0.30	- 0.26	1 .92	3 .24	2 .65	1 .65	0 .07	- 2.00	- 3.02	- 3.95	9 .53
Rate of return percentiles											
90%	-	6 .4	6 .8	6 .2	5 .3	4 .8	4 .4	3 .9	3 .4	2 .6	5 .5
75%	-	4 .8	6 .2	5 .7	4 .8	4 .4	3 .9	3 .4	2 .8	2 .0	4 .2
50%		-	5 .3	4 .9	3 .9	3 .6	3 .1	2 .7	2 .1	1 .1	2 .6
25%			2 .5	3 .4	2 .7	2 .3	2 .1	1 .8	1 .3	0 .30	0 .5

10%				2.0	1.6	1.4	1.1	0.9	0.6	0.5	-

*Age eligible respondents in 1992 include all respondents who either themselves or their spouse were between 51 to 56 years of age in 1992. Public employees and their spouse are excluded. Values are calculated using survey weights.

Comparing rates of return between the two cohorts, the real median rate of return fell from 2.6 percent in 1992 to 1.8 percent in 2004. Again, roughly speaking, the rate of return to those in the top three deciles in 2004 is lower than the difference in average returns. Although this might be taken to suggest there is more redistribution in 2004 than in 1992, it should be remembered that the overall rate of return is lower in 2004.

However, the data in rows 3 and 4 of the top panel of each table does generate a bottom line regarding the various measures of distribution and redistribution at the level of the individual. The amount of redistribution of own benefits was somewhat, but not overwhelmingly higher for the 2004 cohort than for the 1992 cohort.

B. Differences in Redistribution Among Households by Cohort

Next Table 7 turns to data on benefits and taxes for households, counting within benefits paid not only benefits based on own work, but also including spouse and survivor benefits. Once households are considered, the picture changes. Recall our finding in Table 5 that in 2004, 11.7 percent of benefits was redistributed from *individuals* falling within the three top deciles of earners to those in lower deciles. In the top panel of Table 7, which pertains to households in 2004, we find that 7.08 percent (-.42 - 2.17 -.48) of benefits are redistributed from members of the top three deciles of household units. Remember here that there are at least two major differences between redistribution among individuals and households. First, although individual and household earnings are imperfectly but positively related for men, the relationship is much weaker for women. Second, the data in Table 7 include the top ups on own benefits for spouse and survivor benefits.

When these factors are taken into account, although there is redistribution, it is considerably less at the level of the household than at the level of the individual. This bottom line from our earlier work and those of other authors remains. Although the benefit formula is designed to be redistributive, and is redistributive at the level of the individual, lower earnings of women and the presence of spouse and survivor benefits at the household level continue to reduce the degree of redistribution fostered by the Social Security benefit formula.

On the other hand, there are important changes indicating that the redistribution fostered by the Social Security benefit formula has increased over time. The bottom panel of Table 7 shows the extent of redistribution at the household level for the cohort of 2004.

Comparisons between the bottom and top panels of Table 7, along with the previous comparisons between Tables 5 and 6, indicate two changes in the extent of redistribution fostered by Social Security for members of the two cohorts. [12] The amount of redistribution at the household level is higher in 2004 than in 1992. Moreover, the increase in redistribution through 2004 is greater at the household level than at the level of the individual.

These findings are summarized in Figure 1. While the share of total benefits redistributed at the individual level increased from 9.51 percent in 1992 to 11.68 percent in 2004, the share of total benefits redistributed among households increased from 4.51 percent in 1992 to 7.08 percent in 2004.

Tables 8A and 8B report the distributions of rates of return by AIME decile for the cohorts of 2004 and 1992 respectively. Looking at the third row, the rate of return for members of the second AIME decile (column 2) had a median value of 3.3 percentage points in 2004 and 5.1 percentage points in 1992. By the highest decile of earners, the median value has fallen to 0.5 percentage points in 2004 from 1.5 percentage points in 1992.

[12] In our earlier study we found five percent of the total benefits accruing to households are redistributed from households falling in the top three deciles of earners. The results from our earlier study, which pertained to the full, original HRS cohort in 1992, are not comparable to the findings for the Early Boomer cohort. There are a number of sources of difference. For one thing, the 1992 cohort examined in our earlier paper is older (51 to 61 years old) in the base year than are the samples of 51 to 56 year olds. This means that for the original HRS cohort, benefits were discounted over fewer years than they are for the cohorts examined in this paper. That is, it takes fewer years between the date of the survey and the date Social Security benefits are first collected for a cohort that is 51 to 61 years old than for a cohort that is 51 to 56 years old. Age differences aside, other factors create differences between the Early Boomer and Original HRS cohorts. As mentioned previously, the age of receipt of full benefits was lower for the HRS cohort, who did not face the complete increase of the full retirement age to 66. In addition, interest rates were much higher during their period of high earnings for the HRS cohort. As a result, the value of their tax contributions is increased. One might consider a simulation exercise where those age 51 to 56 in 1992 are given a birth date that occurs twelve years later. However, the members of the Original HRS cohort would have lower earnings than the Early Boomers. Adjusting for growth in earnings would require also adjusting for changes in the occupational and educational distribution of earnings, a task well outside the scope of this paper.

Figure 2 compares the rates of return by AIME decile at the family level. Contrary to the direct measures of benefit redistribution reported above, although they are lower in 2004 than in 1992, the rates of return decline at roughly the same rate in 2004 as they did in 1992. Thus a comparison of the distributions of rates of returns by AIME decile does not suggest a strong difference in benefit redistribution for members of the 2004 cohort.

Figure 1

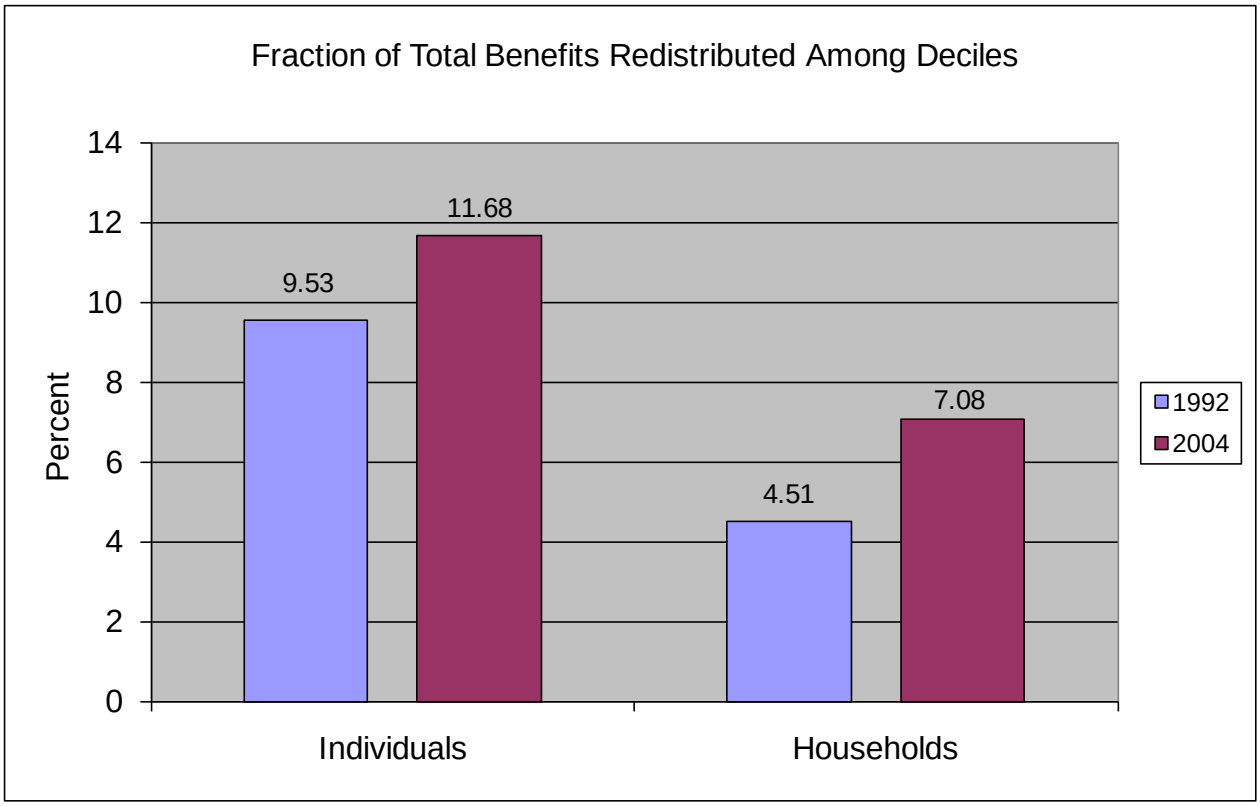
Fraction of Total Benefits Redistributed Among Deciles
Percent
14
12
10
8
6
4
2
0
9.53
11.68
4.51
7.08
Individuals
Households
1992
2004

Figure 2

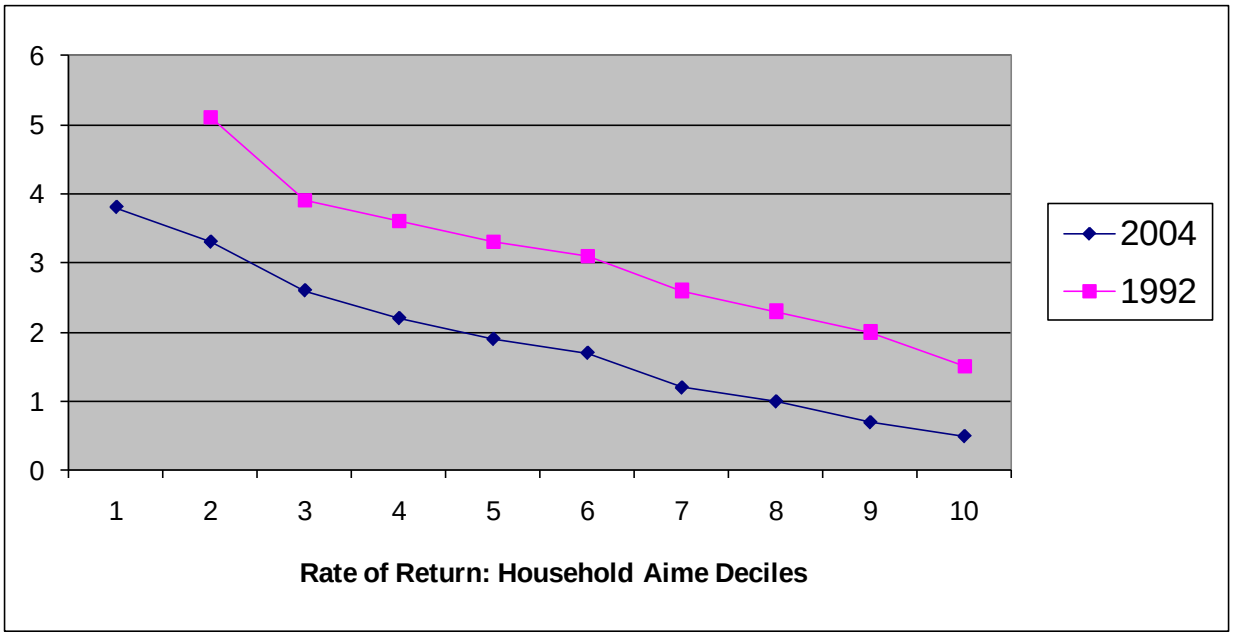
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10
2004
1992
Rate of Return: Household Aime Deciles

Table 7: Measures of Distribution of Household Social Security Benefits and Taxes for All Age Eligible* Respondents, Early Boomer and Original HRS Cohorts

	Annualized Household AIME deciles: 2004 (2004 dollars)										
	0 -12 K	1 2-23	2 3-33	3 3-41	4 1-52	5 2-63	6 3-75	7 5-88	8 8-103	1 03+	A ll
Average family lifetime taxes	$ 32K	8 7	1 38	1 80	2 18	2 79	3 16	3 65	4 35	5 47	2 60
Average family lifetime benefits**	5 5	1 36	1 86	2 14	2 58	3 08	3 37	3 74	4 01	4 40	2 71
Measure of redistribution % by which benefits are increased	6 0%	4 9	2 8	1 5	1 0	4	- 0.01	- 3	- 14	- 23	-
Share of total benefits redistributed to decile	1 .00%	1 .93	1 .76	1 .08	0 .89	0 .44	- 0.00	- 0.42	- 2.17	- 4.48	7 .08
	Annualized Household AIME deciles: 1992 (2004 dollars)										
	0 -5K	5 -13	1 3-21	2 1-29	2 9-37	3 7-44	4 4-51	5 1-59	5 9-69	6 9+	A ll
Average family lifetime taxes	$ 10 K	3 9	7 6	1 13	1 49	1 85	2 20	2 49	2 87	3 65	1 70
Average family lifetime benefits	8	7 0	1 15	1 58	2 04	2 39	2 73	3 00	3 42	3 79	2 09

Measure of redistribution % by which benefits are increased	-33%	45	23	12	9	3	1.1	-2.1	-3.8	-16.1	
Share of total benefits redistributed to decile	-0.22%	1.13	1.14	0.84	0.86	0.37	0.14	-0.30	-0.63	-3.36	4.51

*Age eligible respondents in 2004 include all respondents who were either themselves between 51 to 56 years of age in 2004 and in 1992, or their spouses fell in that age range.

** Household benefits include own benefit plus top ups.

Table 8A: Rates of Return on Social Security Benefits and Taxes by AIME Decile, Early Boomer Cohort, Ages 51 to 56 in 2004

	Annualized Household AIME deciles: 2004 (2004 dollars)										
	0 -12 K	1 2-23	2 3-33	3 3-41	4 1-52	5 2-63	6 3-75	7 5-88	8 8-103	1 03+	A ll
Rate of return percentiles 2004											
90%	5 .1	4 .4	4 .1	3 .6	3 .3	3 .0	2 .6	2 .2	2 .1	1 .8	3 .8
75%	4 .7	3 .9	3 .3	2 .9	2 .6	2 .5	2 .0	1 .8	1 .6	1 .2	2 .7
50%	3 .8	3 .3	2 .6	2 .2	1 .9	1 .7	1 .2	1 .0	0 .7	0 .5	1 .6
25%	-	2 .0	1 .7	0 .7	0 .7	0 .7	0 .6	0 .4	0 .4	0 .3	0 .2
10%	-	-	-	1 .2	0 .6	0 .4	0 .2	-	-	-	-

*weighted

Table 8B: Rates of Return on Social Security Benefits and Taxes by AIME Decile, Households with One Member 51 to 56 in 1992

	Annualized Household AIME deciles: 1992 (2004 dollars)										
	0 -5K	5 -13	1 3-21	2 1-29	2 9-37	3 7-44	4 4-51	5 1-59	5 9-69	6 9+	A ll

Rate of return percentiles											
90%	6.0	6.5	5.5	5.2	5.0	4.5	4.4	3.9	3.8	3.2	5.2
75%	-	5.9	4.9	4.6	4.3	3.9	3.6	3.2	3.1	2.4	4.1
50%	-	5.1	3.9	3.6	3.3	3.1	2.6	2.3	2.0	1.5	2.7
25%		3.2	2.7	2.3	2.0	2.0	1.6	1.2	0.8	0.5	1.2
10%		-	1.5	1.1	1.0	1.0	0.8	0.3	0.2	0.2	-

*weighted.

V. Robustness of Findings

This section examines the sensitivity of differences in measured outcomes between the 2004 and 1992 cohorts to two differences between the relevant time periods in which they worked and claim benefits. First, there has been an increase in the share of household consisting of one divorced person that may affect measures of distribution and redistribution (Tamborini, Iams and Whitman, 2009). Second, there are differences in the interests rates applied to the two cohorts. These differences in interest rates affect some measures of difference between the periods. But using the interest rate for the 2004 cohort as a baseline, all finding regarding the present values of benefits, taxes and redistribution affecting this most recent cohort are unaffected by these sensitivity analyses.

Sensitivity to Changes in Family Structure

Table 9 presents revised measures of redistribution when household weights are adjusted to hold constant the share of one person, divorced households. Specifically, the share of such households in 2004 is adjusted to the level in 1992.

As seen in Table 7, when the household distribution is not adjusted for changes in the share of single, divorced households, 7.08 percent of total benefits are redistributed. When the mix of households is standardized to control for the growth of households with a single, divorced person, the bottom row, bottom column of Table 9 suggests that 7.25 percent of total benefits are redistributed. Thus our findings are not very sensitive to the increase in the number of divorced households.

Sensitivity to Changes in the Interest Rate

When computing outcomes for the 2004 and 1992 cohorts, different interest rates were used. The rates used for the 2004 cohort are those in place twelve years later than the interest rates used for the 1992 cohort. Interest rates are generally higher for the 1992 cohort. A higher interest rate reduces the present value of benefits and increases the present value of taxes paid when yearly values are moved to the base period. Thus if the 1992 cohort enjoyed the lower

interest rates experienced by members of the 2004 cohort, the present value of their benefits as of 1992 would have been even higher, and the present value of their taxes lower.

To estimate the effects of these differences in interest rates, Table 10 presents the present values calculated for the 2004 cohort (column 1) and the 1992 cohort (column 2) using the interest rates that actually applied to those cohorts, and then in column 2 calculates comparable values for the 1992 cohort using the interest rates that applied to the 2004 cohort. All values are taken to the base year, either 1992 or 2004 as appropriate, and are converted to 2004 dollars.

The rows of Table 10 then report the present value of taxes, the present value of benefits, and the share of total benefits redistributed among deciles. The first group of figures is reported for individuals based on own earnings. The second set of rows reports results for households from each cohort and sums own benefits of each spouse in married households, as well as spouse and survivor benefits.

The last column of Table 10 indicates the share of the difference in the relevant value between the 1992 and 2004 cohort that is due to the interest rate. For example, take the present value of benefits to be received by households. The measured difference in benefits is from $209,000 in 1992 to $271,000 in 2004. An difference from $209,000 to $226,000 is due to the lower interest rate facing the 2004 cohort. So as reported in column 4, 27 percent of the difference in benefits is due to the difference in interest rates [(226-209)/(271 - 209)]. In the case of taxes, the higher tax rate applicable to the 1992 cohorts taxes increased the base value of the tax, and caused the difference in the taxes paid by the 2004 and 1992 cohorts to be understated by just over a quarter. These findings mean that the raw differences in present value overstate the fall in the benefit/tax ratio for Social Security between 1992 and 2004. Nevertheless, there has been a substantial decline, as indicated by the fall in the rates of return, which are not subject to this problem. Remember that whatever the implications for differences between the cohorts in benefits and taxes, the level of benefits and taxes paid by the 2004 cohort still differ in present value by only 4 percent, as shown in Table 4.

More importantly from the perspective of this paper, the differences in redistribution measured in this paper are hardly affected by the difference in the interest rate. As seen in the

last column, last row of Table 10, the measured difference in redistribution affecting each cohort is changed by only 14 percent when the interest rates are standardized.

These exercises suggest our findings are not sensitive either to the differences in the structure of families between the cohorts, or to differences in the interest rates that prevailed between the two cohorts.

Table 9: Measures of Distributions of Household Social Security Benefits and Taxes for All Age Eligible* Respondents Weights are adjusted for divorced families.

	Annualized Household AIME Deciles: 2004 (2004 dollars)										
	0 -12 K	1 2-24	2 4-34	3 4-43	4 3-53	5 3-63	6 5-76	7 6-89	8 9-105	1 05+	A ll
Average family lifetime taxes	$ 34 K	9 1	1 46	1 87	2 34	2 86	3 30	3 82	4 45	5 65	2 70
Average family lifetime benefits**	$ 58 K	1 42	1 95	2 24	2 70	3 25	3 40	3 85	4 12	4 47	2 80
Measure of redistribution % by which benefits are increased	6 0%	4 9	2 5	1 5	8	7	- 2	- 4	- 13	- 24	-
Share of total benefits redistributed to decile	1 .05%	2 .02	1 .63	1 .13	0 .73	0 .69	- 0.28	- 0.62	- 1.88	- 4.47	7 .25

*Age eligible respondents in 2004 include all respondents who were between 51 to 56 years of age in 2004 and in 1992, or their spouses fell within that age range. Values are calculated using survey weights.

** Household benefits include benefit based on own earnings plus top ups.

Table 10: Sensitivity of Measures of Benefits, Distribution and Redistribution to the Interest Rate Employed (Interest rates applicable to persons of the same age from the 2004 cohort are applied to benefits and taxes for members of the 1992 Cohort)

	2004 Cohort Using 2004 Interest Rates	1992 Cohort Using 2004 Interest Rates	1992 Cohort Using 1992 Interest Rates	Share of 2004-1992 Cohort Difference Due to Interest Rate
Values for Individuals Based on Own Earnings				
Present Value of Benefits	135	110	102	.24
Present Value of Taxes	166	90	104	-.23
Share of Total Benefits Redistributed	11.68	9.19	9.53	.16
Values for Households				
Present Value of Benefits	271	226	209	.27
Present Value of Taxes	260	145	170	-.28
Share of Total Benefits	7.08	4.86	4.51	.14

Redistributed				

All values of benefits and taxes are in thousands of 2004 dollars.

VI. Conclusions

This paper has used three different measures of the redistribution of benefits to gauge the extent of redistribution fostered by the Social Security progressive benefit formula. We have compared those measures when applied to cohorts of households from the Health and Retirement Study born twelve years apart. First, comparing the 1992 and 2004 cohorts, benefits received by members of the highest AIME deciles are reduced by a greater proportional amount in 2004 than they were in 1992. Second, the fraction of total Social Security benefits redistributed from high to low earning individuals increased from 9.5 percent to 11.7 percent. At the household level, the fraction of benefits redistributed from high to low earning households increased from 4.5 percent to 7.1 percent. Nevertheless, a 4.6 percentage point gap remains between the share of benefits redistributed at the individual and household levels. As a third measure, we compute the rate of return to Social Security taxes for members of each AIME decile. These rates of return have declined by roughly equal amounts for members of different AIME deciles. In sum, the 2004 Social Security system, by some measures, was somewhat more effective in redistributing benefits to low AIME households, but was still substantially less effective in redistributing benefits among households arrayed according to lifetime covered earnings than it was in redistributing benefits among individuals according to own earnings.

Looking to the future, it will not be long until data for the 2010 HRS households become available. One can expect an update of this study to indicate progress in the same direction as measured here. Women from the new, younger HRS cohort will have shown even greater attachment to the labor market. Nevertheless, it is not clear that the Social Security system will have succeeded in redistributing benefits among families with different incomes to the extent suggested by the basic benefit formula.

From a policy perspective, this study provides basic facts upon which to base any policy changes meant to revise the redistributive effects of the OASI system. The degree of redistribution remains quite modest at the household level. Perhaps the lack of effective redistribution has increased the popularity of the program as a source of income in retirement. That is an issue for policy makers to wrestle with. They must decide whether they are happy with

the rather modest level of redistribution of Social Security benefits at the household level, or whether they would prefer a system that is more, or less, redistributive.

References:

Biggs, Andrew G., Mark Sarney and Christoper R. Tamborini. 2009. “A Progressivity Index for Social Security. Social Security Issue Paper No 2009-1. January.

Coronado, Julia Lynn, Don Fullerton and Thomas Glass. 2000. “The Progressivity of Social Security”. NBER Working Paper 7520.

Goda, Gopi Shah, John B. Shoven and Sita Nataraj Slavov. 2011. "Differential Mortality by Income and Social Security Progressivity". In David A. Wise, Editor, *Explorations in the Economics of Aging*. Chicago: University of Chicago Press for NBER: 189-204.

Gustman, Alan L. and Thomas L. Steinmeier. 2001. “How Effective Is Redistribution Under The Social Security Benefit Formula?” *Journal of Public Economics* 82 (1): 1-28.

Gustman, Alan L., Thomas L. Steinmeier and Nahid Tabatabai. 2010. "The Growth in Social Security Benefits Among the Retirement Age Population from Increases in the Cap on Covered Earnings". NBER Working Paper 16501.

Harris, Amy Rehder and John Sabelhaus. 2005. "How Does Differential Mortality Affect Social Security Finances and Progressivity?" Washington, D.C.: Congressional Budget Office, Working Paper.

Hurd, Michael. 2011. Comment on "Differential Mortality by Income and Social Security Progressivity". In David A. Wise, Editor, *Explorations in the Economics of Aging*. Chicago: University of Chicago Press for NBER: 205-208.

Iams, Howard M., John W.R. Phillips, Kristen Robinson, Lionel Deang and Irena Sushi. 2008. “Cohort Changes in the Retirement Resources of Older Women”. *Social Security Bulletin* 68(4): 1 – 13.

Liebman, Jeffrey B. 2002. “Redistribution in the Current U.S. Social Security System”. In Martin Feldstein and Jeffrey B. Liebman, editors. *The Distributional Aspects of Social Security and Social Security Reform.* Chicago: University of Chicago Press: 11 – 48.

Smith, Karen, Eric Toder, and Howard Iams. 2003. “Lifetime distributional effects of Social Security retirement benefits”. *Social Security Bulletin* 65(1): 33–61.

Tamborini, Christopher R., Howard M. Iams and Kevin Whitman. 2009. “Marital History, Race, and Social Security Spouse and Widow Benefit Eligibility in the United States”. *Research on Aging* 31(5): 577-605.