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How Effective is Redistribution Under the Social Security Benefit Formula?

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Abstract

This paper uses earnings histories from the Social Security Administration, linked to the survey responses for participants in the Health and Retirement Study, to investigate redistribution under the current social security benefit formula. As advertised, own benefits are significantly redistributed from individuals with high to those with low lifetime earnings. However, redistribution is roughly halved when spouse and survivor benefits are taken into account and redistribution is measured among families. When families are arrayed by total earnings during years when both spouses are engaged in substantial work, there is very little redistribution from families with high to low earnings capacity.

Author's Acknowledgements

I. Introduction.

This paper examines how a system with a progressive formula specified according to *individual* earnings, supplemented by a policy designed to redistribute benefits from dual earner toward single earner families, affects the distribution of benefits among *families* with different lifetime earnings or earning capacities. The conventional wisdom is that the social security benefit formula is highly redistributive, favoring low over high earners. It certainly is true that the structure of the benefit formula is highly progressive, replacing, up to maximum covered earnings, a much higher share of earnings for *individuals* with low than high earnings. The focus on the *individual* may be misplaced, however. From a public policy perspective, the proper accounting unit for evaluating redistribution is the *family*.

The distribution of family earnings will differ from the distribution of individual earnings. The relation of the earnings distributions for individuals and for families will depend on the correlation of the wage and labor supply for each spouse and between spouses. If wives have lower wages than husbands, then we can expect less redistribution among families than among individuals, since some of the redistribution at the individual level will be from husbands with greater lifetime earnings to their wives with lower lifetime earnings.

A second factor, which mitigates the degree of redistribution is that in addition to benefits based on own earnings, social security often pays additional spouse or survivor benefits to the spouse with the lower earnings. The amount of these benefits depends on the earnings of the spouse, and is greater the greater the difference between the lifetime earnings of the two spouses.[1] The evidence suggests spouse and survivor benefits are larger in families with high earnings. If husbands with high earnings are married to spouses with considerably lower lifetime earnings, spouse and survivor benefits will be more important in high income families. This, in

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[1] Spouse and survivor benefits almost always accrue to the woman in the household. For example, in 1998, there were 2.5 million women and 24,000 men who were dual beneficiaries receiving spouse benefits (Social Security Administration, 1999, Table 5.G3). Similarly, 4.8 million women and 36,000 men received nondisabled widows' or widowers' benefits in 1998 (Social Security Administration, Table 5.F8).

turn, implies that social security will foster less redistribution among households than among individuals (Steuerle and Bakija, 1994).

Low lifetime earnings may arise because individuals have low wage rates, or because they work few hours or years. Families with similar earnings capacities can supply different amounts of labor over their lifetimes, and the current policy effectively subsidizes families with a spouse who remains home for many years rather than working in the market.[2] To determine the extent to which families that supply less time to the labor market benefit disproportionately under the current system, we will examine redistribution among families when they are arrayed by their earnings capacities as well as by their realized lifetime earnings.

This paper documents the sources and characteristics of redistribution from these various features of the social security benefit formula, and from the relation between individual and family earnings. The next section briefly discusses prior literature on the subject, followed by a section, which examines the workings of the social security benefit calculation in more detail. Section IV discusses the data used in the study. The principal data source is social security earnings records in the Health and Retirement Study (HRS), and this is supplemented by the respondents' reports of their work histories. Section V considers years of work and earnings in those years for respondents falling into different lifetime earnings categories. The lifetime earnings used is Average Indexed Monthly Earnings (AIME), the same measure as is used by the Social Security Administration. Especially in the low AIME categories, low lifetime earnings can arise either because the respondent worked relatively few years or because annual earnings were low. The next section calculates redistribution measures for individual and for families, and groups the results according to both individual lifetime earnings and family lifetime earnings. Section VII considers what the redistribution looks like when we group families

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[2]In Gustman and Steinmeier (2000), we find that the social security benefit formula fosters redistribution to immigrants, and provides the highest returns to immigrant families who have been in the U.S. for ten years and who have high yearly earnings. Something similar is going on here among those who qualify for social security benefits, allowing families with a member who has been in the labor force for relatively few years to enjoy a higher benefit-tax ratio.

according to a measure of the potential earnings that the families could have earned if both spouses had worked most or all of their adult years.[3]

The calculations we will make are directly relevant to the debate about the effects of privatizing some or all of the Social Security System. It is often argued that privatization would undermine the redistribution fostered by the progressive social security benefit formula. For example, in commenting on our analysis of outcomes under a particular proposal for a voluntary privatization system (Gustman and Steinmeier, 1998), David Cutler (1998, p. 358) argues:

> "We typically think that giving people choice is optimal since people can decide what is best for them. Thus the economic bias is to believe that, if people want to opt out of social security, they should be allowed to do so. In the context of social security privatization, however, this analysis is not right. Allowing people to opt out of social security to avoid adverse redistribution is not efficient; it just destroys what society was trying to accomplish. If rich people and two-worker families opt out of social security, for example, we will no longer be able to redistribute from rich to poor or from dual earners to single earners. One of the purposes of social security will have been defeated. This is a cost of privatization of which we must be aware."

Our analysis will determine just how much redistribution the current system fosters. This information is required by policy makers to decide whether they are still happy with the redistribution that is being fostered by a set of rules established many years ago, when the typical household had a single earner. The calculations will also provide a benchmark to help understand the effects of various reforms. Any large change in the system is going to require an accounting of winners and losers, which in turn depends on the extent of redistribution under the current system. In addition, a major determinant of whether, if given the choice, individuals would choose to participate in a system of privatized or other individual social security accounts

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[3]Some lawmakers strongly advocate the payment of spouse and survivor benefits to encourage one parent to remain at home with young children. To equalize the treatment of one and two earner households under social security, other lawmakers have proposed various plans that would split the credit for earnings in any year evenly between both household members, while eliminating spouse and survivor benefits.

over the current system, or to vote for a privatized system, is whether or not they benefit from redistribution under the current system.

II. A Brief Overview of Prior Literature.

When social security was designed, it was recognized that there was a tension between the goals of individual equity and social adequacy. To meet individual equity alone, social security might have been designed to provide benefits as in a private insurance system, with expected benefits corresponding to the sum of payments over time. Social adequacy referred to the provision of a minimum level of support.[4]

The method for simultaneously achieving these goals is relatively crude.   Own retirement benefits are specified as a nonlinear function of lifetime earnings as measured from covered earnings histories, where a higher share of the first dollars earned is replaced than of additional earnings (a fuller description of the benefit formula is provided in Section III). However, ten years of covered earnings are required to attain eligibility for benefits based on own earnings, and there is no effective test to identify poverty status and to link poverty status to benefits (Myers, p. 19). (After recent reforms, the earnings test does not have a substantial effect on the present value of the benefits to which an individual is ultimately entitled).

Within the current environment, how well does social security meet the goals of social adequacy and equity? With regard to the goal of equity, Boskin et. al (1987) and Steuerle and Bakija (1994) examine the redistribution that social security fosters among families with different structures, contrasting benefits and taxes among singles and couples with one and two earners. Old age benefits are determined by the earnings of the individual, not the family. Yet a person with low earnings may come from a family that is quite well off. Spouse and survivor

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[4]Specifically, social adequacy was interpreted as "...a minimum income which will prevent their becoming a charge on society. Not until this is accomplished should financial resources (whatever, if anything, may remain of them) be considered as available to provide individual differentiation aiming at equity."Quoted from Reinhard A. Hohaus, "Equity, Adequacy, and Related Factors in Old Age Security", American Institute of Actuaries, Vol. 37, 1938, in Robert Myers (1993), Appendix B.

benefits further erode the target efficiency of any redistribution. Thus they find that families with similar earnings histories may be treated very differently. Bosworth, Steuerle and Burtless (1999) argue that the earnings patterns used in previous studies are misleading because they assume steady earnings throughout careers. They argue that researchers should use more representative earnings patterns. These patterns can be seen in micro data.

To meet the criterion of social adequacy, social security redistributes benefits among recipients in accordance with own earnings history. To judge the extent of this redistribution, and its effect on families, once again we require micro data. In addition to the present paper, projects from two other teams of investigators also examine micro data, using different data sets and complementary techniques to our own. Liebman (1999), in a paper completed contemporaneously with our own, modifies data from the Survey of Income and Program Participation, using cohorts born from 1925 to 1929 and 1945 to 1949. As in our paper, Liebman has available matched earnings records from the Social Security Administration. He creates a simulation model and uses the model to analyze redistribution due to social security, and to project redistribution under the current social security rules and into the future, with life tables and tax and benefit values for 2075. Coronado, Fullerton and Glass (1999, 2000a and 2000b) construct covered earnings histories from respondent reports of their yearly earnings in PSID data. They embed these earnings histories in a simulation model, which they use to analyze the effects on the distribution of benefits and taxes of the current system, and of various schemes to reform social security.[5] Feldstein and Liebman (1999) use the data for the 1925 to 1929 birth cohort from SIPP, the same data as in Liebman (1999), to analyze redistribution under proposed privatization reforms.

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[5]To be included in the sample, Coronado, Fullerton and Glass (1999, 2000a and 2000b) require that the respondent remain in the PSID sample for the entire period. Although the effects of attrition bias are not clear, this is a very selective sample since low earners and the divorced are more likely to be lost. In contrast, when social security earnings records are available for a representative sample as in the HRS, attrition over the period is not an issue. To be sure, selection bias in matching the social security records for survey respondents is an issue. However, studies to date do not show any important systematic relationship between observables and the availability of a matched social security record in the HRS (Gustman and Steinmeier, 1999; Haider and Solon, 1999; and Olson, 1999). All of this said, Coronado, Fullerton and Glass have similar findings to those in the present paper. They conclude that "the current social security system cannot be considered progressive."

As we will discuss in Section VI when we compare our findings with theirs, studies by both sets of authors reach conclusions that are substantially similar to our own. Despite a specific aim of promoting social adequacy, the current system is not very effective in redistributing benefits among families in accordance with their incomes or earnings capacities.

III. A Conceptual Framework.

A. How the Social Security Benefit Formula Works.

For each individual, the Social Security Administration calculates a measure of lifetime earnings, which is an average of the high 35 years of earnings, with zeros used if the individual has not worked 35 years. A progressive benefit formula is then applied so that those who have low computed lifetime earnings have higher benefits, relative to earnings, than do those with high earnings. Specifically, the formula for 2000 specifies benefits that are 90 percent of the first $6,372 of annual earnings, 32 percent of the next $32,052, and 15 percent of remaining earnings. The earnings measure is typically expressed as a monthly amount, the Average Indexed Monthly Earnings (AIME), and the benefit amount is called the Primary Insurance Amount (PIA).

Benefits to spouses and survivors affect the relationship between benefits and earnings, both at the level of the individual and at the level of the family. Spouses are entitled to roughly half of their partner's benefits, and survivors are entitled to an amount roughly equal to the benefits that would have been payable to the deceased spouse.[6] Divorced individuals who did not remarry before the age of 60 can collect benefits as though they were still married as long as the marriage lasted longer than 10 years. In all cases, an individual is paid first the benefit that he or she would collect on the basis of his or her own earnings record. If the spouse or survivor benefits would be more, the individual is considered a "dual beneficiary," and an additional

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[6]The exact payments to each spouse also depend on when the benefits are claimed. These rules are described in *The Annual Statistical Supplement to the Social Security Bulletin.*

payment is made to raise the benefits to the level of spouse or survivor benefits they are entitled to.[7]

As a result of these rules, only the high earner in a household generates spouse and survivor benefits for their spouse. In addition, the more a secondary earner makes, the less spouse and survivor benefits are worth to the family. Thus spouse and survivor benefits are of greatest value to couples with one predominant earner, which often are families where the earnings of the working spouse are relatively high. Although the progressive benefit formula would appear to work to the advantage of a secondary earner, the availability of spouse and survivor benefits largely negates this advantage. Even if the secondary worker did not work, he or she would often collect nearly the same amount of benefits anyway as spouse or survivor benefits. Holding constant the level of total family earnings, a family receives higher benefits if those earnings were due to only one spouse, rather than to both (Steuerle and Bakija, 1994).

B. Individual Versus Family Earnings.

However benefits are calculated, whether they include only the basic benefit or spouse and survivor benefits, measures of redistribution will differ depending on whether they are calculated over individuals or over families. Thus it is worthwhile to briefly discuss how earnings in the family relate to earnings by individuals.

Lifetime income for each individual is the sum over the working life of the individual's wage rate in each year times the fraction of that year worked. Some of the individual earners are husbands and some are wives. Typically, the earnings of wives are lower than those of their husbands, because the wage rate is lower, because the fraction of each year worked is lower, and because the number of years worked are lower. As a result, redistribution fostered by the Social

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[7]There are exceptions when a spouse was employed in a job not covered by social security, in particular as a state and local government worker who did not contribute to the system. There also are other exceptions governing the benefits of individuals who have pensions from uncovered employment. The Social Security System also provides benefits to the disabled and to surviving minor children. This paper is concerned with old age and survivors benefits, and does not address the issue of the distribution of disability or other benefits than retirement, spouse and survivor benefits.

Security System, when measured among individuals, will to some extent involve redistribution from husbands with higher earnings to wives with lower earnings.

Thus when we ask how well social security redistributes benefits among families according to their incomes, and how the redistribution among families relates to the redistribution among individuals, it will be important to consider how individuals aggregate into family units. Lifetime family incomes are simply the sum of the lifetime individual incomes of the two spouses. As Smith (1979) carefully explains, the relationships between the distributions of individual and family earnings will depend on the correlation between the wage offers to husbands and their wives, which we expect to be positive as long as schooling is correlated between husbands and wives, and on the variation of labor supply with own and with spouse's earnings. If wives work less in households where husbands have high earnings, that will narrow the distribution of family earnings relative to the earnings distribution of individual earnings.

Our aim in the empirical section is to determine the extent of redistribution fostered by the current Social Security System on the basis of each individual's earnings, and then to see how the extent of redistribution changes when we instead look at redistribution on the basis of total family earnings and finally at redistribution on the basis of *potential* family earnings, which is what the family could earn if both partners worked full time.

IV. The Data.

The Health and Retirement Study (HRS) is a longitudinal, nationally representative study of older Americans. The survey began in 1992 with an initial cohort of 12,652 individuals from 7,607 households, with at least one household member born from 1931 to 1941. Social security earnings histories were linked for 9472 respondents, or about 75 percent of the respondents to the survey.[8] Of the respondents with linked earnings histories, there were 7,370 who were born

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[8] In wave 1, 72 percent of respondents gave permission to link social security earnings histories to their interview record. That was raised to 80 percent as a result of additional attempts in waves 2 and 3 to obtain permissions. Records were actually linked for 95 percent of those who gave permissions.

between 1931 and 1941, for whom the HRS is representative. In the HRS nomenclature, these respondents are said to be "age eligible." The remaining respondents are included in the survey because they were married to age eligible respondents, but by themselves they do not form a representative sample of those age groups.

There are a number of caveats we should mention at the outset of the empirical analysis. First, the HRS samples a cohort born from 1931 to1941. Members of that cohort exhibit higher levels of women's labor force participation than are found in cohorts born before them, but lower levels of participation than are found for cohorts born after 1941. Thus the redistribution fostered by the Social Security System will differ for the cohorts who follow the HRS.

The analysis uses the current benefit law and the tax schedules in place at the time wages were earned. The rules governing social security will certainly be subject to change as policy makers attempt to introduce financial balance into a system that is insolvent in the long run. But the HRS cohort is old enough that while its members may experience some reduction in social security benefits, the scope for such a reduction is narrowing as the cohort ages. For example, even if there were a compromise that raised the normal retirement age, as time passes, such a compromise is less and less likely to be applied to those born before 1941. Since most of the social security taxes levied on the HRS cohort have already been paid, payroll tax increases enacted in the future also will have limited effect on the members of this cohort.[9]

Third, in this paper, when calculating the current value of yearly social security benefits, we use the mortality tables from the Social Security Administration, which are age and gender specific. Using the results of Duleep (1989), we then adjust these mortality tables according to the lifetime earnings of the household to reflect the fact the members of families with high

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[9]We are aware that changes in social security to be adopted in the future may reduce benefits or raise taxes for younger cohorts, equivalent to twenty percent of their benefits or more. Without knowing how revisions will be shaped, and if some degree of privatization will be introduced, we have no way of knowing how redistribution will be changed by any remedy that is adopted in the future. Thus we focus on outcomes that are consistent with current social security benefit formulas and taxes, for a generation that is on the verge of retirement.

incomes live longer than members of families with low incomes. The nature of such an adjustment will have an obvious impact on the measure extent of redistribution.

Fourth, some of the findings are sensitive to the interest rates employed. For the most part, we use actual interest rates observed to date. To project for the future, we use the intermediate interest rate and wage growth assumptions from the Social Security Administration.[10]

V. Relation of AIME to Work History and Wage Rates.

In this section we assess the earnings and work patterns of the age eligible population in the HRS. The unit of observation throughout this section is the individual. All information in the tables assessing patterns of work and earnings is taken solely from the actual social security records from 1951 to 1991.[11] Only age eligible respondents with actual social security records are analyzed in this section, and only earnings prior to and including 1991 and earnings below the social security maximum are considered.[12] The purpose of this section is to analyze the actual pattern of working years and the wages over those working years, without introducing the uncertainties fostered by imputations.

A. Average Earnings and Work Effort by Gender and AIME.

First we consider in Table 1 the average values of work and earnings for various annualized AIME categories as of 1992. Since AIME is the average of the highest 35 years of covered earnings, including zeros if the individual does not have 35 years of earnings, in most

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[10]If one uses a very low interest rate, it is possible to conclude that, when spouse benefits in high income households are taken into account, the benefit formula is regressive in the way it redistributes within generations. See Steuerle and Bakija (1994).

[11]In particular, the AIME amounts reported in this section are the highest 35 years of earnings through 1991, indexed to 1992 using the social security average earnings index.

[12]In calculating household earnings, or in categorizing an earner as a primary or secondary earner in the family, it is occasionally necessary to impute the earnings of the spouse if the spouse (or former spouse, in the case of widowed respondents and divorced respondents whose marriages lasted 10 years or more) does not have a social security record.

cases this amount is roughly proportional to lifetime covered earnings. For each AIME group, the table reports, for men and women separately, the years of work, the annual earnings during those years, the lifetime earnings of the household, and the weighted percentage of observations in each AIME category. In this table, annual earnings and lifetime household earnings amounts are indexed to 1992 using the social security average annual earnings index and are in thousands of dollars.

In computing the number of years of work and the average earnings during those years, we note that many of the social security records include occasional years of almost trivial covered earnings, particularly in the early years. These amounts may be due to low-paying summer jobs and similar work, which we would not want to include in measures of serious work effort. To avoid including these years, we introduce the notion of "significant" earnings. An earnings amount is considered significant if it is higher than 25% of the average of the highest five years of (CPI) indexed earnings. A five year average is used to mute the effect of a year of very high earnings. This measure of years of significant earnings excludes an average of about fifteen percent (four years) of positive covered earnings because the earnings involved were too low, and the ratio is slightly higher for women than for men.

Turning now to the amounts in the tables, we can see that for both men and women, low AIME amounts appear to be due to a combination of relatively low numbers of years of work and relatively low wages during those years. The number of years of earnings rises rapidly for the first five or six AIME categories and then rises more slowly thereafter as the number of years approaches the maximum feasible amount. The earnings amounts, in contrast, continue to rise as AIME rises throughout the range of AIME categories. Within any particular AIME category, there do not appear to be large differences between men and women.

The higher overall number of years worked and average earnings for males in contrast to females, as reported in the bottom row of the table, is due to the distribution of respondents over the AIME categories. Three quarters of the females are in the lowest four AIME categories, while only about a fifth of the males are in those categories. Because the women fall

predominantly in the lowest AIME groups, with few years of earnings, female HRS respondents have only three-fifths of the number of years of significant earnings as do the males, and only about half of the average earnings amounts in those years, as reported in the last row in the table.

B. Lifetime Household Earnings.

Another major difference between the males and the females occurs when we look at lifetime household earnings. Lifetime household earnings in this table is the sum of all social security covered earnings in the household in the 1951-1991 period, indexed to 1992 by the social security average earnings index. For individuals whose spouses were not interviewed, spouses were imputed by matching procedures.[13] Widowed respondents and divorced respondents whose marriages lasted for more than 10 years are treated as married for this purpose, and these former spouses were also matched.[14] If a spouse did not have a social security record, we used the information collected during the interviews to impute one.[15] Based on the sample for whom we do have social security records, the correlation between AIME's produced by the imputation procedure and the actual AIME as calculated from the record is around 0.9.

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[13]The imputed match is done on the basis of gender, cohort, race (3 categories), earnings (6 categories), and assets (8 categories), which are available for the spouse even if the spouse was not interviewed. For the match, we look at married respondents who had characteristics which were identical (or as nearly so as we could find) to the characteristics of the non-interviewed spouse. We imputed for 2.6 percent of the spouses of married respondents.

[14]For widows and divorced respondents, we do not have any information about the former spouse, so the match is based on the characteristics of the respondent. In this case, we try to find spouses who were married to individuals with the same gender, cohort, race, and educational attainment (7 categories) as the widowed or divorced respondent. We substitute educational attainment for earnings and assets, since earnings and assets can be significantly affected by the fact of widowhood or divorce. 6.3 percent of the respondents were widowed and 10.7 percent were divorced from marriages that lasted 10 years or longer.

[15]Specifically, we used the starting date on their current job and the starting and ending dates for their last jobs, a previous 5 year job, and up to two other jobs with pensions. Respondents were also asked about final earnings on those jobs. In addition, we used information in Wave 3 about the date of entry into the labor force, how many years were worked before the date the previous job was secured, and how many years of work were in jobs covered by social security. Earnings for other years are estimated by adjusting observed earnings on the basis of experience. The coefficients for experience, based on data from the Survey of Consumer Finances, are: experience .0138, experience squared -.000283, and experience * education .000996 (Anderson, Gustman and Steinmeier, 1999).

With men, the lifetime household earnings grows rapidly with increased AIME, from $169K for men in the lowest AIME group to $1,558K for men in the highest AIME group. Low wages for men are associated with low lifetime earnings for the household. For women, however, there is not nearly as much variation in lifetime household earnings with the AIME. For instance, women in the lowest AIME category have an average of $687K in lifetime household earnings, almost four times the lifetime household earnings of men with similar AIME amounts. For women, unlike men, having low AIME amounts does not generally mean low lifetime household earnings.

This point is amplified in Table 2, which looks at the distribution of lifetime household earnings for both males and females in lower AIME categories. Each column represents the distribution of lifetime household earnings for individuals in that AIME category, and the columns sum to 100% (excluding rounding errors). In each column, there is a cluster of individuals at the lowest observed level of lifetime household income, which essentially represents the minimum household income consistent with the AIME category. For men in the low AIME groups, the numbers drop off rapidly at higher lifetime household earnings categories, reflecting again that men with low AIME are likely to live in households with low lifetime earnings. For women in the low AIME groups, the clusters of individuals at the lowest lifetime household earnings category is much less pronounced, and instead there is a second mode at a much higher level of lifetime household earnings. While it is still the case that some women with low AIME's live in households with low lifetime earnings, it is more likely than was the case for men that they are married to individuals with higher earnings and as a result live in households with substantial lifetime earnings.

C. Distributions of Respondent and Spouse AIME's.

The driving force behind these results appears to be that a substantial number of women are married to husbands whose AIME is considerably more than their own. Table 3 sheds more light on this issue. The columns of this table are the annualized AIME groups of the respondents, and the rows are the annualized AIME groups of their spouses. Note that entries

along the main diagonal correspond to respondents and spouses having roughly similar amounts of earnings, while entries in the upper right or lower left corners of this table correspond to one spouse having considerably more earnings than the other spouse.

The fact that there are substantial entries in the upper right and lower left corners of the table confirms that there are many respondents and spouses with considerably different earnings. In fact, the correlation in this table is slightly negative at -0.17. This means that there even are more couples with disparate earnings histories than would occur if the AIME's of respondents and spouses were randomly matched.

The table also contains a comparison between the distributions of married respondents and single respondents. Relative to married respondents, single respondents are slightly overrepresented in the lower AIME groups and slightly underrepresented in the higher groups, and hence have a lower AIME overall. This result comes from offsetting effects not shown in the table: unmarried men have about three-fourths as much AIME as married men, but unmarried women have almost half again as much AIME as married women. However, because the men's earnings are higher, they dominate the overall effect.

VI. Redistribution of Social Security Taxes and Benefits Among Individuals and Families.

The next set of results deals with distributions of social security taxes and benefits. Since in this section we are more concerned with redistribution, rather than with distributions of work and earnings, we felt that it was important to include the full sample in these calculations. Hence, we include all age eligible respondents, regardless of whether they had a social security record or not, and we impute records for those for whom none was obtained.[16] Further, these results use earnings, which are projected beyond 1991 until the individual's indicated expected retirement age[17]. The AIME figures reported in this section are the real value of the expected

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[16]See the previous footnote for information on these imputations.

[17]Future earnings are projected by assuming that real earnings observed in the last year in the 1991 will persist until the respondent's expected retirement date. If the respondent has no earnings in 1991, zeros are projected for future years. If the expected retirement age was greater than 70, or if the individual indicated that he never expected to

actual AIME. As specified in the social security rules, the AIME indexes nominal earnings amounts up to age 60 by the social security average annual earnings index and uses earnings after age 60 at their nominal value. The value of the resulting nominal AIME is adjusted from age 62 to 1992 using the Social Security Administration's projected inflation rate.

A. Alternative Measures of Redistribution.

Table 4 presents baseline results for all age eligible respondents using *own* benefits and taxes. Each column of figures pertains to ten percent of the covered individuals, with the deciles defined according to place in the distribution of AIME. [18] The first two rows are ex ante expected taxes and expected benefits. To calculate these figures, the taxes and benefits each year are adjusted for the probability of collecting them.[19] The resulting figures are then indexed to 1992 using the 10 year government bond rate if the year is before 1992, or the Social Security Administration's projected interest rate if the year is after 1992. Finally, the adjusted taxes are added to get the figures in the table, and the same is done for benefits. Taxes and benefits are measured in thousands of 1992 dollars, and Table 4 includes results for all age eligible respondents.

The last column of the table indicates that for the HRS cohort, on average social security taxes will exceed own benefits. The difference is about $15,000 per age eligible HRS respondent.[20] We use the current law, rather than a hypothetical law revised to restore financial

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retire, a retirement age of 70 was used unless the individual had already worked beyond that age in 1992. If the respondent did not provide an expected retirement age, an age of 62 was used, again unless the respondent had already worked beyond that age. An average of 6.2 years of earnings were imputed using this procedure.

[18]Table 4 groups the population by AIME decile, which is a change from the earlier tables. The earlier tables address the question of how hours and earnings are distributed in each AIME category, and having even dollar brackets facilitates that discussion. However, the distributional issues discussed in Tables 4 and 5 are most easily understood if the population is grouped into deciles.

[19]The expected taxes and benefits are calculated ex-ante from the time the individual starts paying taxes using the survival tables discussed in Section IV.

[20]Because taxes are collected on average 30 years or so earlier than benefits are paid, this amount is extremely sensitive to the exact series used to discount taxes and wages to a common date.

balance in the system, as the baseline in judging the current amount of redistribution.[21]

Reflecting the progressivity of the benefit formula, respondents' benefits exceed taxes through the bottom half of the income distribution. For the upper half of the distribution by AIME, taxes exceed benefits, by increasing amounts as we move through the deciles. The lowest decile has very little in the way of either taxes or benefits, and over three-quarters of this decile does not have any benefits at all because they will not have worked more than the 10 years necessary to entitle them to benefits.

The next two rows of the table measure redistribution among the various deciles. The first of these two rows compares actual benefits of the group to the benefits that would have been received if benefits were simply pro-rated to taxes *for the entire population*. This measure of redistribution is a measure of *net* redistribution *to* the decile. For instance, the value of 36.8% in the fourth decile means that the actual benefits of that decile are 36.8% higher than would be the case if benefits were proportional to taxes for the entire population. This 36.8% obviously comes at the expense of other deciles. The first decile gains little because any progressivity in the benefit formula is offset by the requirement of at least 10 years of earnings of covered earnings. In the second and third deciles, benefits are 50 percent higher because of the redistribution from other deciles. On the other hand, those in the top AIME decile receive 33.2% less than their pro-rata share of taxes; those benefits are redistributed to those in other deciles.

The row labeled as "Share of Total Benefits Redistributed to the Decile" looks at redistribution to those in the AIME decile in another light. The previous row expressed the net redistribution to the group as a percentage of total benefits to the group, but this row expresses the net redistribution to the group *as a percentage of the total benefits for all individuals*. The

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[21]As noted earlier, if efforts to fix the insolvency of the system are adopted soon enough, the shortfall of benefits below taxes in Table 4 may understate the shortfall between benefits and taxes experienced by the HRS cohort. But the HRS cohort is old enough that its members may not experience a further reduction in social security benefits. Without knowing how revisions will be shaped, and if some degree of privatization will be introduced, we have no way of knowing how redistribution will be changed by any remedy that is adopted. Using similar reasoning, it will be dangerous to project the experience of the HRS cohort onto younger cohorts without making significant adjustments.

share of redistribution rises between the second and third deciles principally because the benefit amounts are larger in the third decile, but from the third decile on, the share of redistribution measure again declines as AIME increases. The top two deciles provide almost all of the amount redistributed. The sum of the negative figures in this row gives the percentage of total benefits, which are redistributed among the upper deciles to the lower deciles. This calculation indicates that 10.6 percent of total benefits are redistributed.

The final rows of the table give percentiles for internal rates of return. Before calculating these rates, the taxes and benefits are indexed to 1992 using the historical CPI or the projected social security inflation rate. That means that these rates are effectively real rates. To get these figures, each individual in the group has a real internal rate of return calculated. These rates are then arrayed by value, and the (weighted) percentiles are found by picking the appropriate spot in the distribution.[22] An examination of these figures reveals that when the benefits approximately equal taxes in the previous rows, the internal rates of return are approximately 3.0%. Another way to interpret this is that the average of the historical real returns for the HRS cohort has been approximately 3.0%. Note also that the percentage of observations is a weighted percentage, as in the previous tables. On average, these real rates of return are 4.8 percent for those in the 90th percentile of returns, to 0.4 percent for those in the 10th percentile of returns. The distributions of returns decline as expected as AIME increases.

B. Measures of Redistribution Including Spouse and Survivor Benefits.

The top row of Table 5 repeats the third row of Table 4 and gives the percentage of total benefits given to (or taken away from) the various deciles, looking only at the benefits the respondent received on the basis of his or her own earnings record. However, if a respondent is married, his or her spouse may receive additional benefits based on the respondent's earnings record, above and beyond the benefits that the spouse would receive on the basis of their own earnings record. These additional benefits, although not paid to the respondent, are attributable

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[22]The missing entries in the table correspond to instances where the respondent did not have the 10 years of covered earnings and hence is ineligible for benefits.

to his or her earnings record. Accordingly, the second row of Table 5 examines the redistribution of total benefits among the deciles, allowing for spouse and survivor benefits as well of own benefits.[23]

Since spouse and survivor benefits become increasingly important as the earnings of the respondent substantially exceed the earnings of the spouse, adding spouse and survivor benefits increases benefits proportionately more for the higher AIME groups. This offsets to some degree the redistribution away from these groups, and the net effect is that the redistribution away from the upper two AIME groups is reduced by around a third as compared to the situation when we looked only at own benefits. Corresponding to this is the fact that the redistribution to the lower AIME groups is also reduced by about a third.

The final column of Table 5 indicates the fraction of total benefits that are redistributed from the higher AIME deciles to lower AIME deciles. This figure is taken by adding the negative amounts in the row. These figures show that once spouse and survivor benefits are considered, the amount of redistribution from the higher AIME deciles to the lower AIME deciles falls by about a third, from 10.6 percent of total benefits to 6.8 percent.

C. Measures of Redistribution Using Family Benefits and Family AIME Distributions.

The introduction of spouse and survivor benefits introduces the notion that perhaps it is best to look at social security taxes and benefits within the context of the family as a whole. The third row of Table 5 does this. In this row, individuals are arrayed not on the basis of their own AIME, but on the basis of the family AIME, which is defined as the sum of the AIME's of the two spouses if the respondent is married, widowed, of divorced from a marriage of 10 years or more, and as the AIME of single respondents and divorced respondents whose marriage lasted fewer than 10 years. Taxes are the total social security taxes on the household, and benefits are

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[23]More specifically, the first row uses only the social security taxes, including the employer share but excluding the disability and medicare taxes, and the benefits that the respondent will collect on the basis of his or her own earnings. The second row uses the same taxes but includes the benefits that the spouse will collect of the basis of the respondent's earnings over and above the benefits that the spouse would collect anyway based on the spouse's own earnings.

the sum of the own benefits of both spouses plus any additional spouse or survivor benefits that may be due the family.[24] Redistribution to the family occurs to the extent that the family's actual benefits exceed the benefits, which it would have received as a pro-rata share of taxes.

To avoid double counting in this framework, we should only count the redistribution to or from any particular family once. To do this, we allocate half of the redistribution amount accruing to the family to each spouse.[25] If both spouses are age eligible, the entire redistribution amount is included in the calculations, half attributed to the husband and half attributed to the wife. Note that both spouses must necessarily be in the same family AIME group. If one of the spouses is age eligible but the other is not, only the half attributable to the age eligible spouse is included in the calculations.

Relative to the previous row in the table, switching to annualized family AIME deciles and considering redistribution of family benefits generates two noticeable changes. First, the amount of redistribution away from the upper deciles further decreases modestly, from 6.8 percent to 5.0 percent. This represents a reduction of about a quarter in the total benefits which are redistributed from the upper deciles to the lower deciles.

More notably, looking at the family AIME deciles and the redistribution of benefits among families gives a much different impression of the target of the redistribution. Using individual AIME deciles, even considering spouse and survivor benefits, most of the amounts redistributed went to the second through the fifth deciles, with hardly anything going to the lowest decile. Using family AIME deciles, the amount of redistribution to the third through fifth

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[24]These calculations sum the ex ante taxes and benefits of the two partners, even if one of the partners has died or if the partners are divorced, as long as they were married for at least 10 years. This treats married and widowed/divorced respondents on an equal ex ante basis, and does not treat the woman whose husband dies one year before the survey differently from the woman whose husband dies one year after the survey. We impute the former husband's earnings based on individuals matched via the process described in footnote 14.

[25] The observations in this table are still individuals, although they are now classified by family AIME. In some results, Liebman (1999) classifies families based on the AIME for the high earner; in others he classifies families based on the AIME for the total covered earnings of both spouses. In the latter case, he divides both taxes and benefits evenly among each spouse, a treatment that by itself would generate tables that, during the period of the marriage, are analogous to the tables we construct that report redistribution based on family AIME.

deciles is very sharply curtailed. In the second line of the table, about 5.5 percent of total

benefits was redistributed to these three deciles; in the third line this amount is reduced to 2.0

percent, a reduction of about two thirds. On the other hand, the amount of redistribution going to

the lowest decile is increased substantially, from almost nothing to about 1.4 percent of total

benefits.

It is important to note that this 1.4 percent redistribution to the lowest decile is 1.4

percent of the total benefits of the entire population. Since the benefits received by the lowest

decile are relatively low, the 1.4 percent redistributed to them represents an increase of over a

quarter in the benefits that they would otherwise get. Thus, although the total amount

redistributed among the deciles is slightly lower using family AIME deciles, the amount targeted

toward the lowest decile increases substantially.

VII. Redistribution When Families Are Classified By Earnings Capacity.

The last line in Table 5 reports on the pattern of redistribution when respondents are

grouped by family earnings capacity. Earnings capacity is approximated by the measure of

"significant earnings" that we used earlier in the paper. Recall that significant earnings is the

average amount earned in years when earnings amount to more than 25 percent of the average of

the highest five years of indexed earnings.[26] Less technically, it is the average amount earned in

years when the individual was seriously committed to work. Thus significant earnings are

roughly proportional to potential lifetime earnings, while the AIME measures of the previous

lines in the table are roughly proportional to realized lifetime earnings. The two concepts differ

because not all potential earnings will be realized if the respondent has extended periods not

working.[27] In last line of the table, respondents are grouped by the significant earnings for the

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[26]In Table 5, these earnings figures include all earnings, not just covered earnings below the social security
maximum earnings amount.

[27] For example, if the wife earns $40,000 for 7 years, her significant annual earnings are $40,000 even if she is out of
the labor force for the other years.

respondent's *family*, which is simply the sum of the significant earnings for the two spouses.[28] As in the previous line, the amounts redistributed to or from a particular family is divided evenly between the two spouses in the calculations.

As we have seen earlier, many individuals in the lower deciles of the individual AIME distributions have a substantial number of years when they could have worked but did not. As a result, their significant (or potential) earnings are considerably higher than their annualized AIME amounts, which essentially include zeros in the earnings average for the years that an individual does not work. As we found in Table 2, most of the individuals with low AIME are women, and furthermore most of these women had family income amounts far above what would be expected on the basis of their own earnings. The clear implication is that many of the individuals in the lowest AIME groups are women who are married to men with substantial earnings power and who have chosen to not work during substantial parts of their lives.

By moving from a classification of individuals on the basis of their family AIME, as is done in the third line of Table 5, to one that is based on their combined significant annual earnings, as is done on the fourth line, families are grouped more on the basis of their earnings potential. That is, individuals in the same decile in the fourth line of Table 5 could have earned approximately similar amounts, regardless of whether the family made the (presumably voluntary) decision for the wife to stay at home rather than continue to work.

Looking at the fourth line of Table 5, moving to a classification based on potential earnings has little effect on the bottom decile, which receives 1.5 percent of the total benefits of the population as a transfer. In the other deciles, however, the amounts of the transfers between deciles are considerably reduced. The total amount of redistribution from the higher income deciles to the lower deciles has fallen from 5.0 percent of total benefits in line 3 to only 2.5

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[28]Coronado, Fullerton and Glass (1999a) order families based on full family earnings, which assumes that each spouse works full time at the wage observed when they were working. We obtain the same ordering among families when we use "significant earnings" for the family to order families by their earnings capacity. They also make an alternative calculation where they use the average wage for the sample to value leisure at the same price across each individual.

percent of benefits in line 4. The biggest change is in the top decile, which contributed only a fifth as much when individuals are grouped according to potential family earnings as they did when they are grouped according to actual family earnings.

In comparing the third and fourth lines of Table 5, it is important to keep in mind that the total amount redistributed among families is the same in the two lines. For each family, the amount redistributed is the actual benefits minus the benefit that they would receive as a pro-rata share of the taxes they paid. The only difference is the way these families are grouped into the deciles. The fact that the total redistribution among deciles is lower in the bottom row of Table 5 compared to the third row implies that the redistribution within the deciles must be higher. In fact, since there is so little redistribution among deciles in the bottom row, most of the redistribution must be within deciles. In turn, most of the redistribution within deciles defined on the basis of potential earnings must be from families with two earners to traditional families with roughly the same combined earning power but in which only one spouse is a lifetime worker.

Figure 1 looks at these results using rates of return, which gives more emphasis to the importance of the redistributions to the members of the group and places less emphasis on the absolute amounts of the redistributions. The vertical bars for each decile show the range of rates of return for the 25th to 75th percentiles, and the lines between the decile ranges connect the medians.[29] The top panel shows the strong redistribution when deciles are computed according to each respondent's AIME. In the second panel, where individuals are grouped by family AIME, the solid line becomes flatter, corresponding to the finding above that almost half the redistribution fostered by the social security benefit formula is eliminated when we evaluate redistribution on a family rather than on an individual basis. In the third panel, where families are grouped according to their significant earnings, the system redistributes hardly at all except at

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[29]Rates of return could not be calculated for the lowest decile in the top panel and for the 25th percentile of the bottom decile in the middle panel because the respondents do not have the 10 years of covered work to be eligible for benefits.

the lowest decile. In this case, virtually all of the redistribution is within deciles rather than between deciles. Taken together these results suggest that whatever redistribution exists under the current system is largely redistribution among families with similar potential earnings capacities and benefits traditional families with a spouse who chooses not to work.

There are several caveats about these results we should mention. First, while "significant earnings" probably captures the earnings potential of heads of household and others who spend most of their lives in the labor market, it probably understates the potential of a secondary earner who stayed home to raise kids. Had these secondary earners been in the labor force more, they undoubtedly would have accumulated more human capital and would have had larger "significant earnings." However, as shown previously, many of these secondary earners are married to higher income respondents, and a measure that would more accurately capture their true earnings potential would push their potential family earnings into higher deciles. Since these individuals are by and large recipients of the redistribution, this would reduce the net redistribution away from these deciles and reinforce the conclusion that, aside from the first decile, there is relatively little redistribution going on.

A second caveat is that the analysis is done on a pre-tax basis. Although it is not clear whether this should be considered a part of the tax code or part of the Social Security system, taxation of benefits will affect households with high income more than with low income. This, in turn would increase the redistribution of the system. A related caveat is that only the social security old age and survivor benefits are considered here; inclusion of disability benefits would also increase the redistribution of the combined system.

The third caveat concerns the long run state of the system, which does not appear to be able to continue without some change. If the system continues in the same basic format, either taxes must be increased or benefits must be reduced. However, it is important to note that a general tax increase or benefit reduction will not affect the results presented in Table 5. The reason is that for a particular decile, the redistribution percentage can be expressed as:

$$R_i = [b_i - B(t_i / T)] / B$$

where R_i is the redistribution to decile i, b_i and t_i are the benefits and taxes of the decile, and B and T are the benefits and taxes of the entire population. The term $B(t_i/T)$ is the amount of benefits as a pro-rata share of taxes. It is relatively straightforward to show that proportional increases in t_i and T (for an increase in taxes) or proportional decreases in b_i and B (for a reduction in benefits) would leave the redistribution measure unchanged. On the other hand, a conversion to a system of privatized accounts would make family benefits proportional to family taxes and would eliminate the redistribution.

A fourth caveat is that the results might be sensitive to various assumptions, including assumptions about the interest rate or mortality. To test the interest rate assumption, we used the social security low cost assumptions about the interest rate, which leads to a long run interest rate of 6.5 percent rather than 6.3 percent. This leads to a substantial reduction in the present value of benefits, 7.6 percent in the family benefits case, but redistribution patterns, which are relatively unchanged from Table 5. To test the mortality assumptions, we omitted the correction of mortality for income levels and compared the results to the results presented. As expected, the redistribution toward lower income groups increased in this case, but again the redistribution amounts fell dramatically as one moves down Table 5. In the calculations involving own benefits and taxes and using individual AIME deciles, 12.6 percent of benefits was redistributed, while using family benefits and taxes and grouping according to potential family earnings, 4.6 percent was redistributed.

A final caveat is that the analysis focuses on the relative amounts of redistribution, whereas in some cases what matters is the degree to which redistribution keeps households out of poverty. To investigate this, we calculated what percent of households would be below the poverty line on the basis of their social security benefits alone, both with and without redistribution. The results were that without redistribution, the social security benefits of 26.4 percent of the households would be below the poverty line, but after redistribution only 21.8

percent of the households would still be below the line. Thus, social security has the potential to reduce the poverty rate of households relying solely on the benefits by about a fifth.

One might also ask how the results for the HRS cohort compare to those for younger cohorts. The articles by Coronado, Fullerton and Glass (1999, 2000a and b) and Liebman (1999) both projected the underlying populations into the future in judging the redistribution fostered by the current system. The principal findings in Liebman are based on a simulation that uses the earnings history and retirement dates of the cohort born from 1925 to 1929, but projected forward to 2075. He measures the extent of redistribution within the cohorts examined both directly and by the difference between the returns for each individual and the cohort average rate of return to taxes paid. He finds that much of the redistribution fostered by the current system is not based on income, with only 5 to 8 percent of the benefits paid resulting in within cohort transfers that are income related. His results suggest that there is less redistribution than is commonly believed because the effects of the highly progressive benefit formula are largely offset when benefits are redistributed to high income households with a nonworking spouse through spouse and survivor benefits, and to higher income households because of their longer life expectancies. The population examined in Cornado, Fullerton and Glass is based on data from the PSID, with earnings for that population base projected into the future. The findings evaluate the redistribution fostered by the current system, allocating benefits to families. Benefits are calculated using the earnings histories projected to the future, while the distribution of benefits is examined using a potential family earnings concept, where each family member works 4000 hours. Distributions are also taken for other measures of income. The authors find that the current social security system is only slightly progressive, and find that the reforms will not have much of an effect on the redistribution fostered by social security. Even though they were using different data sets and different methodologies, and they have projected the populations and earnings histories into the future, the conclusions of these two studies accord with our own.

VIII. Conclusion.

This paper has investigated the extent to which the social security benefit formula redistributes benefits from high to low earners. The extent of redistribution that is found depends on how one defines high earners. The benefit formula clearly redistributes own benefits from own taxes when incomes are measured for each individual by own AIME. Much of the redistribution at the individual level is from men to women. The extent of redistribution is halved, however, when benefits and taxes for both spouses are analyzed at the level of the family. Moreover, the remaining redistribution is mostly from families that have spent many years in the labor force to those with fewer years of work. Thus when we array families by earnings in years that they work, which is a measure of potential earnings, we find that the benefit formula redistributes very little from families with high earnings potential to families with low earnings potential. The remaining redistribution, however, goes primarily to families in the lowest decile and contributes significantly to their benefits.

A direct examination of the social security benefit formula, and a finding that benefits are redistributed from high to low earners when people are classified according to own AIME, might suggest to policy makers that the current system is highly redistributive. One might then believe that there is a considerable potential cost in terms of foregone redistribution to going from the present system to an alternative that does not explicitly redistribute, e.g., to a system of national retirement accounts that is neutral with regard to redistribution. However, our evidence suggests that it is a mistake to argue for the current social security benefit formula on the grounds that it is highly redistributive from families with high earnings potential to families with lower potential. A better argument could be made if the focus were on redistributing from two earner families to traditional families with one earner and a stay-at-home spouse.

Without repeating all of the caveats mentioned earlier, it is appropriate to end with a word of caution. The results presented in this paper pertain only to a single cohort, those born from 1931 to 1941. Further investigation is required before these findings can be generalized to the cohorts that will follow. Nevertheless, it is clear from these results that the general

perception that a great deal of redistribution from the rich to the poor is accomplished by the progressive social security benefit formula is greatly exaggerated. As a result, adoption of a social security scheme with individual accounts designed to be neutral with regard to redistribution would make much less difference to the distribution of social security benefits and taxes among families with different earnings capacities than is commonly believed.[30]

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[30]Feldstein and Liebman (1999) discuss features of a system of individualized accounts that would foster redistribution.

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Table 1
Earnings and Years of Work By AIME Group and Gender

	Males				Females			
Annualized AIME	Years of Significant Earnings*	Annual Earnings	Lifetime Household Earnings	Percent of Observations	Years of Significant Earnings*	Annual Earnings	Lifetime Household Earnings	Percent of Observations
$ 0-3K	7	$ 8K	$ 169K	5%	6	$ 6K	$ 687K	31%
3-6	12	14	278	5	14	12	840	18
6-9	16	17	426	5	19	14	953	14
9-12	20	18	515	6	21	17	1068	11
12-15	24	20	664	6	25	19	1179	8
15-18	26	22	768	7	26	23	1225	6
18-21	28	24	879	7	28	25	1312	4
21-24	30	27	980	9	30	26	1441	3
24-27	31	29	1148	9	30	30	1486	2
27-30	32	32	1233	11	32	32	1448	2
30-33	33	34	1379	13	30	37	1732	1
33-36	33	37	1455	12	34	35	1654	1
36+	36	38	1558	8	36	37	1701	0
All Respondents	27	27	1010	100	16	14	955	100

*Significant earnings are indexed yearly earnings that amount to at least 25 percent of the average of the high five years of indexed earnings. There are 3389 males and 3981 females in this table.

Table 2
Distribution of Lifetime Household Earnings Within Lower AIME Categories By Gender

	Males						Females				
	Annualized AIME						Annualized AIME				
Lifetime Household Earnings Level	$ 0-3K	3-6	6-9	9-12	12-15		$ 0-3K	3-6	6-9	9-12	12-15
$ 0-100K	58%						23%				
100-200	16	53%					4	21%			
200-300	10	18	38%				5	4	20%		
300-400	2	10	25	36%			4	3	4	19%	
400-500	4	8	11	27	26%		3	3	2	5	18%
500-750	9	8	15	23	47		11	11	9	8	10
750-1000	2	3	8	11	17		15	13	12	8	10
1000-1250			2	1	7		18	18	16	13	8
1250-1500		1		2	3		16	23	23	23	20
1500+							1	5	14	24	36

Table 3
Joint Distribution of AIME's of Respondents and Spouses

Counts of Respondents

	Respondent Annualized AIME													
	$0-3K	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24-27	27-30	30-33	33-36	36+	Total
Spouse Annualized AIME														
$0-3K	164	104	98	83	94	97	89	96	84	99	67	63	89	1227
3-6	110	76	45	48	52	48	49	55	56	49	38	48	35	709
6-9	79	50	47	40	39	34	37	43	45	41	31	20	32	538
9-12	100	54	36	44	44	33	36	48	35	32	28	24	25	539
12-15	109	57	42	43	31	32	38	32	33	38	24	18	16	513
15-18	110	54	53	35	42	30	34	34	20	25	13	9	18	477
18-21	116	73	58	44	37	34	35	23	27	15	16	6	13	497
21-24	133	77	71	62	50	40	33	28	21	14	9	5	12	555
24-27	143	75	56	48	52	30	21	22	22	17	6	2	12	506
27-30	117	65	57	41	42	28	16	14	11	3	5	5	7	411
30-33	71	45	24	25	22	16	19	12	5	8	4	1	7	259
33-36	61	39	23	17	18	14	7	6	7	8	4	2	3	209
36+	65	30	24	23	13	18	11	21	6	5	3	5	5	229
Married Respondents	1378	799	634	553	536	454	425	434	372	354	248	208	274	6669
Single Respondents	151	86	82	67	45	62	47	48	38	31	16	11	17	701

Table 4
Baseline Measures of Distributions of Own Social Security Benefits and Taxes for All Age Eligible Respondents

				Annualized Individual AIME Deciles							
Annualized AIME Range*	$ 0-1K	1-4	4-7	7-11	11-16	16-21	21-26	26-31	31-38	38+	All
Average Lifetime Taxes*	$ 1K	9	21	37	57	79	105	130	156	187	78
Average Lifetime Benefits*	1	15	36	48	59	72	86	97	106	113	63
Measures of Redistribution											
Percent by Which Benefits In Decile Are Increased Due to Redistribution	3.2%	51.1	51.7	36.8	21.7	11.3	1.5	-8.8	-18.8	-33.2	-
Share of Total Benefits Redistributed to the Decile	0%	1.2%	2.9	2.8	2.0	1.3	0.2	-1.4	-3.2	-6.0	-
Rate of Return Percentiles:											
90%	4.5	6.2	6.0	5.0	4.3	3.8	3.6	3.0	2.6	2.0	4.8
75%		5.2	5.2	4.5	3.9	3.4	3.1	2.5	2.1	1.7	3.9
50%		4.5	4.6	3.9	3.4	2.9	2.4	2.1	1.9	1.5	2.6
25%		3.3	3.9	3.2	2.6	2.2	2.0	1.8	1.6	1.3	1.6
10%			2.8	2.4	1.7	1.6	1.6	1.6	1.4	1.1	0.4

*In thousands of dollars.

<p style="text-align:center">Table 5</p>
<p style="text-align:center">Share of Total Benefits Redistributed to (from) the Decile*</p>

Annualized Individual AIME Range**	Annualized Individual AIME Deciles										Fraction of Total Benefits Redistributed
	$ 0-1K	1-4	4-7	7-11	11-16	16-21	21-26	26-31	31-38	38+	
Own Benefits and Taxes	0%	1.2%	2.9	2.8	2.0	1.3	0.2	-1.4	-3.2	-6.0	10.6%
Including Spouse and Survivor Benefits	0%	1.0%	2.3	2.0	1.2	0.5	-0.2	-0.9	-2.1	-3.8	6.8

Annualized Family AIME Range**	Annualized Family AIME Deciles										
	$ 0-6K	6-13	13-20	20-26	26-31	31-36	36-41	41-46	46-53	53+	
Family Benefits and Taxes	1.4%	1.1	0.7	0.5	0.8	0.5	0.1	-0.5	-1.3	-3.2	5.0

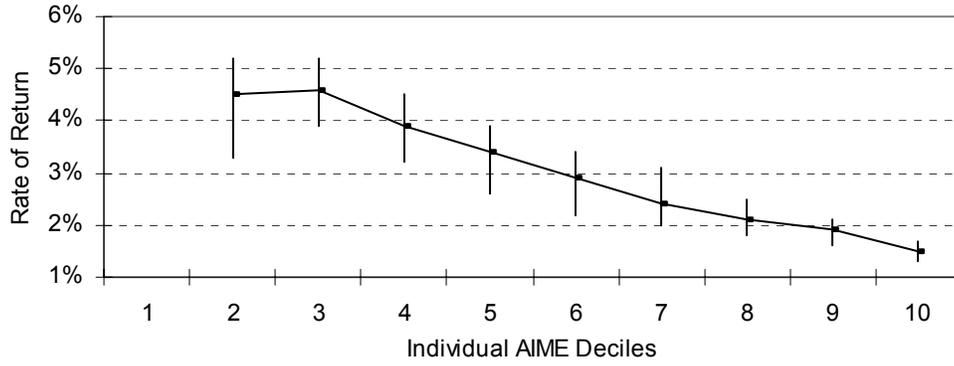| Combined Annual Earnings Range***	Combined Family Significant Annual Earnings Deciles										
	$ 0-13K	13-21	21-29	29-35	35-41	41-46	46-53	53-62	62-79	79+	
Family Benefits and Taxes	1.5%	0.5	0.2	0.1	0.2	-0.2	-0.4	-0.5	-0.8	-0.6	2.5

*Percentages may not add across deciles due to rounding.
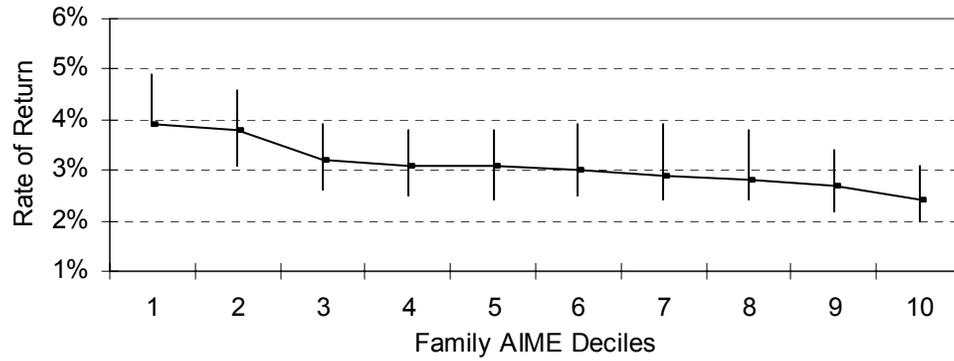
**In thousands of dollars.

***Significant earnings are indexed yearly earnings that amount to at least 25 percent of the average of the high five years of indexed earnings.

Figure 1
Social Security Rates of Return by AIME and Annual Earnings Deciles
25th-75th Percentile Ranges, with Medians Indicated

Returns on Individual Benefits and Taxes

Returns on Family Benefits and Taxes

Returns on Family Benefits and Taxes